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[Dott.ssa Grazia Zuffa](#)

Researcher in Psychology of Dependencies - University of Florence

COMPILED AND REVISED BY:

Dott.ssa Agnese CAMILLI, coordinator

Sig.ra Lorella AUTIZI;

Dott.ssa Giorgia ADAMO;

Dott.ssa Marina BONFILI;

Dott.ssa Rossella SAMPOGNA.

Presidenza del Consiglio dei Ministri



**BIOETHICAL PROBLEMS IN CLINICAL TRIALS WITH
NON-INFERIORITY DESIGN**

24th of April 2009

PRESENTATION

The National Bioethics Committee in the opinion “Bioethical Problems in clinical trials with non-inferiority design” examines clinical experimentation on medicines which do not present an “added value” in terms of better efficacy or lesser toxicity in comparison to medicines already on the market. These are experimentations which, unlike the “superiority” or “equivalence” plans, present some problems of bioethical relevance.

The document, starting from a definition of “non-inferiority” as “similarities within pre-established boundaries”, critically examines the scientific reasons put forward to justify these studies (the possibility of offering patients a useful alternative, better tolerance, lower price), highlighting – even through exemplifications – how only the “superiority” tests have an adequate justification in the interest of the patient, whilst the “non-inferiority” tests mainly answer the needs of the pharmaceutical industry (lower risk, lower cost).

The NBC stresses the inadequacy of the justification, from a scientific and an ethical point of view, of the experimentations of “non-inferiority”, recalling the reduced scientific validity of the research, of the methodological-clinical interest and of the definitive guarantee of efficacy (which is instead assured by medicines which have already been tested and are on the market), the potential “conflict of interest” for the doctor who has the primary obligation to offer patients a therapy which is suitable and of proven efficacy (not guaranteed by the medicines proposed in the study compared to standard treatments), the lack of transparency regarding the informed agreement of the subject who undergoes the experimentation, who often is not given sufficient information regarding the nature of the study that is being conducted.

The opinion of the NBC stresses the principle, accepted in numerous international documents, according to which the specific interest of the patient must not be subordinate to other interests, including commercial ones or those of the sponsor. In particular, the NBC recommends that the “non-inferiority” studies are presented with more transparency and that the ethical committees carefully examine the methodology with which they are planned, approving only the “superiority” experimentations, which can bring potential advantages to the recruited subjects or to the patients who will use the medicine in the future.

The group undertaking this task is coordinated by Prof. Silvio Garattini and is composed of Prof. Luisella Battaglia, Prof. Adriano Bompiani, Prof. Stefano Canestrari, Prof. Cinzia Caporale, Prof. Maria Luisa Di Pietro, Prof. Laura Guidoni, Prof. Luca Marini, Prof. Assunta Morresi, Prof. Demetrio Neri, Prof. Andrea Nicolussi, Prof. Monica Toraldo di Francia and Prof. Giancarlo Umani Ronchi. The opinion drafted by Prof. Silvio Garattini with the contribution of the other members of the group (in particular of the Prof. Adriano Bompiani and Prof. Demetrio Neri) has been discussed in the plenary meeting of the 24th of April 2009 and unanimously approved.

Rome, 24th April 2009

The President
Prof. Francesco Paolo Casavola

Introduction

The clinical experimentation of the medicines, according to the regulations of all industrialised countries, is possible when it is sustained by an adequate rationale inferred by *in vitro* and *live* studies in various animal species, which can establish a potential therapeutic efficacy and the eventual risk of toxicity. Classically three phases are identified in clinical experimentation: phase 1 or the tolerability phase, which determines the maximum dose that can be administered during a specific period of time; phase 2 or the preliminary efficacy phase and phase 3, which has the fundamental task to establish the relationship benefit-risk and therefore the role of the new medicine in the therapy; this is followed by phase 4, which takes place after the marketing and monitors the toxic effects.

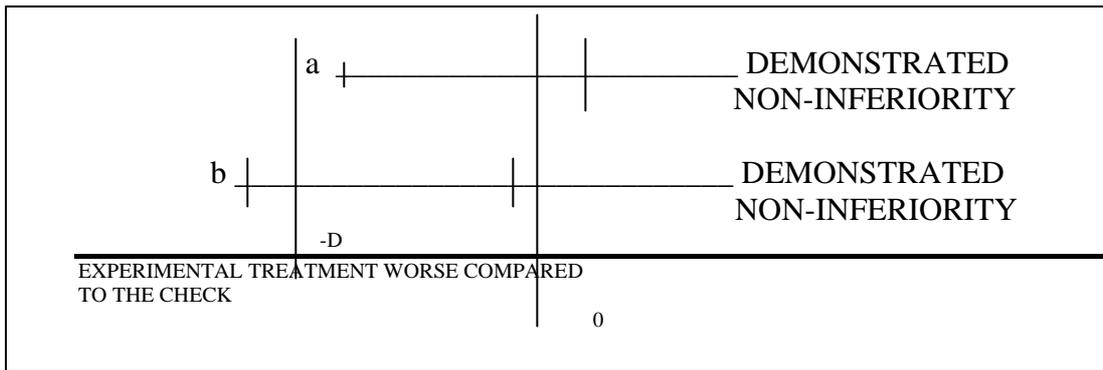
Phase 3 is therefore fundamental for the passing of new medicines and currently consists of two controlled and randomised clinical studies (RCT), in which the medicine can be compared to the placebo or to a medicine of reference with regards to the piece of information which is the object of the study.

Each clinical study should raise an important question, which should be answered conclusively, always keeping in mind that the aim is the benefit of the patient. As the Helsinki Declaration establishes that the placebo cannot be used in case there is a medicine already available (and validated against a placebo) for a specific piece of information, usually the comparisons are carried out between a new medicine and a medicine of reference, used with optimum dosage. We must however highlight, that the European law founder of the European controlling body, EMEA, does not require comparisons but establishes that a medicine must be evaluated on the basis of three characteristics: quality, efficacy and safety (1). It is therefore not necessary to prove the new medicine has an “added value”.

In the realisation of a RCT three different plans can be used: a superiority plan or an equivalence plan or a non-inferiority plan. The scientific literature reports, in the last decade, a considerable increase of RCTs with non-inferiority plan. It seems therefore important to analyse the bioethical implications of this methodology, used in the experimentation of medicines on humans.

Definition of non-inferiority

Non-inferiority is a kind of similarity within predetermined boundaries. The boundary is represented by the level of inferiority considered tolerable for the new medicine, with regards to the standard of reference. This arbitrary difference in terms of loss of efficacy is defined as “margin of non-inferiority” or “delta”. As illustrated in the picture, non-inferiority is considered established when the interval of confidence at 95% of the efficacy of the new medicine, does not exceed the pre-determined boundary of inferiority.



The zero represents the therapeutic effect of the medicine of reference

The zero represents the therapeutic effect of the medicine of reference
 -D represents the acceptable loss of efficacy to establish “non-inferiority”
 a and b represent the therapeutic effect and the boundary of confidence at 95% of two experimental products.

The experimental medicine for which the non-inferiority is verified, can in fact be less efficient and less safe, but not enough to be recognised as such. So, if the margin of non-inferiority is set at 7.5%, a greater incidence of serious events – for example 7% instead of the 5% which the buyer currently risks, that is generally what happens when the medicine is correctly used in therapy – is not considered sufficient to mark a difference between the new and the old treatment. The new medicine will be considered not inferior to the old one, even if when 1000 patients are treated with the first one 20 more deaths or serious events can occur in comparison with the last one.

Reasons given to justify non-inferiority studies

One of the reasons usually presented, is that there can be patients who do not respond to standard treatments and products with similar activity to those treatments can represent useful alternatives. The aim is reasonable, but the approach is not. What is in fact the logic of establishing the non-inferiority of these products in the general population of patients? If their targets are the non-responders to the available treatments, why not verify the superiority of these products in comparison to the medicines that are little effective in this subgroup of patients? This last approach would take into account the interests of the patients, but not the ones of the pharmaceutical industries, who aspire to a market as wide as possible and not only to a section of it, represented by a subgroup of patients. In other words, once patients who are resistant to a specific medicine are selected, the new medicine should be evaluated only with regards to these patients, instead of carrying on a non-inferiority study.

Another reason put forward is that non-inferior medicines from the point of view of their efficacy can be better from the point of view of their safety.

It must however be observed that generally the RCTs do not have the statistical potency to observe a different profile of toxicity. In case it was possible, given the high number of the patients or the high frequency of the toxic symptoms, to evaluate the toxicity, the study would not be of “non-inferiority” anymore but it would become of superiority with regards to safety.

The “non-inferiority” is in many cases justified when a new medicine has characteristics which facilitate the compliance to the treatment by the patient.

For instance a medicine that has to be administered once a week is certainly more comfortable for the patient than one which has to be administered three times a day. However, if this facilitation requires a truly better adhesion, then the clinical result should also be better (not “not worse”) and therefore a superiority plan should be used.

Even in the eventuality – which has never actually occurred – that a non-inferior medicine from a therapeutic point of view was made available at a lower price, it would be difficult to accept. In fact to prove that a possible smaller benefit for individual patients is compensated by the bigger advantage of a more widespread use of the new medicine in the general population, it would be necessary to undertake much more extensive and long term studies compared to the non-inferiority trials. These examples suggest that any question of practical importance for the patients require a superiority test. The superiority test, whether or not the hypothesis proposed takes place, gives information regarding the placing of the new medicine in the context of existing treatments. The non-inferiority test seems instead to answer only the needs of the pharmaceutical industry, ensuring for the new medicine a placing on the market regardless of its value in comparison to medicines already available.

From the point of view of the industry, to prove the non-inferiority of new products is less risky than aiming to establish their superiority. If the superiority test fails, it can damage the image of the product, even if that result in reality can provide useful information to doctors and patients. Non-inferiority studies aim instead at not recognising possible differences (which could inhibit access to the market for the new product) rather than highlighting them (in order to better define the so called “place in therapy” of the new product). A documentation of non-inferiority leaves the product in a kind of limbo: its placing within the other available treatments is not defined, but its placing on the market is nonetheless assured.

An example of the use of the “non-inferiority” boundary

As well as being less risky from the point of view of its image, it is also simpler and less costly to prove the non-inferiority than the superiority, as illustrated in the exemplary case, although extreme, of the study COMPASS (2) which recruited 30 times less patients than the superiority trials that had submitted the same hypothesis to verification (3-5).

The larger the non-inferiority boundary set, that is the worse result designated as area of non-inferiority, the more limited is the sample necessary to test the hypothesis. The smaller the sample, the smaller the investment required to conduct the trial and the much bigger the possibility of not highlighting a possible difference and assert the non-inferiority. This has led to the selection of extreme hypothesis: the COMPASS study, for instance, considered the saruplase thrombolytic equivalent to the streptokinase in the treatment of the acute myocardial heart attack even if 50% more deaths would occur in the group with saruplase then in the control group (2). In absolute terms this means considering saruplase as efficient and safe as the streptokinase even if there were 35 more deaths compared to the 70 expected deaths every 1000 patients. The test of this questionable hypothesis only required 3000 patients, at a time when to verify the superiority of plasminogen’s tessutal activators on the streptokinase involved over 90.000 patients in three big and randomised clinical studies (3-5). Besides the paradoxical hypothesis, results of studies like the COMPASS’ arouse perplexity for the width of the

confidence intervals. At times the width of the intervals is such that what is considered non-inferior from a statistical point of view cannot be non-inferior from a clinical point of view, as in the case of the comparison between thrombolitics (6) antidepressants (7), etc.

From what has been said, some criticality profiles for the ethical evaluation of the equivalence or non inferiority protocols emerge, which now are being looked at in more depth in the light of national and international regulations that regulate the biomedical research on human beings (8,9).

Further criticalities in the non-inferiority plans

One objection to the non-inferiority studies concerns the justification for the research. In all national and international documents on the subject of biomedical research on human beings it is recognised as first and necessary (even if not sufficient) condition for the ethical acceptability of a research, its scientific quality. A research lacking from the point of view of its scientific quality is, for this same reason, unacceptable from an ethical point of view, as already stated, from instance, by this Committee in the document on the Experimentation on medicines (1992), where on the contrary is very sharply stated that any research which pursues “marginal or futile aims” must be rejected. The theme has been amply discussed in literature, also because it is certainly not possible to state that only research which pursues scientific aims of great significance or capable of generating new knowledge of universal importance, should be carried out. Scientific quality can be recognised even in research of more limited significance, capable of bringing information limited to a particular area, but precise, not yet part of the scientific knowledge. To use a consolidated terminology, this kind of research can have an inferior “value” in comparison to research of more general importance, but this does not make it inferior in scientific “value”.

Many technical problems that are difficult to resolve, still exist when the point of view required is that of the public interest. The margin within which the non-inferiority is accepted is difficult to establish because it is impossible, especially for important illnesses, to accept the idea of relinquishing even only a small part of the benefit given by the medicine of reference. The risk is that the medicine considered “non inferior” will be subsequently used as standard in another non-inferiority study, eroding in this way the progress made by the medicine. It is possible that these transitions would allow the authorisation of medicines that in the end will be indistinguishable from the placebo, a phenomenon known by the term of bio-creep (10). In any case, the apparent loss of efficacy can be higher than what has been hypothesised, as the effect of the standard treatment includes that of the placebo: in fact if the standard treatment forestalls 30% of the expected events and the selected non-inferiority boundary of the new medicine allows the new medicine to forestall only 20%, the apparent loss of efficacy is equal to a third, but can be half if the effect of the placebo guarantees 10% of the total effect. Non-inferiority studies in this way expose the patients to clinical experiments without any guarantee that the experimental medicine is not worse than the standard treatment and without any attempt to verify whether maybe it might be better.

The non-inferiority methodology assumes that the patients on which the medicine of reference is evaluated, can be superimposed to those on which such medicine was originally evaluated. Despite the many Regulations introduced (11), such uniformity is very difficult to achieve, as recently

demonstrated by a study which conducted two experimentations rigorously equal at the same time, in which the placebo gave rise to results which were difficult to superimpose (12). Finally, in the non-inferiority studies a conduct that is not very rigorous is what seems to give results: in fact the more there's little adherence to the therapy and neglect of the study by the patients, the more the variability increases and therefore the possibility to demonstrate the non-inferiority (13).

In practice an evaluation of non-inferiority studies has demonstrated that on 383 studies that have been examined, in 64% of cases non-inferiority could be established only if the difference was higher than 50% in comparison to the medicine of reference and in 84% of cases only if the difference was more than 25% (14). A more recent evaluation established that only in 4% of non-inferiority studies under consideration a justification had been given for the choice of margin; in addition in 50% of cases inadequate statistical tests had been employed (15).

A further criticality profile sticks to a well-known problem and, even from the Helsinki Declaration, object to more in depth study: the potential "conflict of interest" that can be generated because of the double role of the doctor when he carries out a research within the therapy: it is important to remember that the doctor's primary obligation is to offer the patient the most appropriate therapy between those proved efficient for his/her pathology. Now, in the case of non-inferiority protocols, the doctor plans to give to a part of his patients a treatment that will be, in the best of cases, not inferior to the one it is being compared to.

It is not ethical to involve patients in non-inferiority studies

What kind of ethics legitimates an approach that seems to hide the differences instead of highlighting them? Non-inferiority studies lack ethical justification because they do not offer any advantage to the patients, current or future. They deliberately relinquish to consider the patients' interests in favour of commercial interests. This betrays the substantial agreement that is established between patients and researchers in any correct and informed consent, which presents randomisation as the only ethical solution to answer such clinical uncertainty. Non-inferiority studies aim only to boast of some efficacy, but without giving definitive proof of it. In the informed consent text it is never made clear to patients what a non-inferiority study means. Few patients would agree to participate in the study if the message in the form that asks for their informed consent was put clearly: why would a patient accept a treatment that in the best of cases is not worse, but in reality could be less efficient or safe than the available treatments? Why would patients participate in a randomised test that will offer only doubtful answers, since non-inferiority includes the possibility of a worse outcome?(16)In the current clinical experimentation the patient has the possibility to confide in the action of ethical Committees, which have to approve the protocols. It is appropriate that ethical Committees are aware of the methodology with which controlled medical studies are planned. Non-inferiority studies should not be approved unless they aim to demonstrate other advantages more relevant to the patients. We should in fact always request that a new medicine is tested only with the "superiority" methodology, to be sure that the study can bring potential advantages to the recruited patients and to the patients who will use the medicine in the future.

It is worth remembering that the DM 18th of March 1998 (reinforced by the DM 12th May 2006), which bears the guidelines for the creation and the

functioning of ethical Committees, in point 3.7.6 states: “As the informed consent represents an imperfect form of protection of the subject, obtaining informed consent is not sufficient guarantee of ethical behaviour and does not exempt the Committee from the need to evaluate the experimentation”. It is not therefore possible to justify the ethical status of a non-inferiority protocol simply appealing to the fact that the patient has been perfectly informed on the logic, the aims, the risks and the benefits of the experimentation, aspects that the ethical Committee cannot but evaluate in light of the documents attached to the request for authorisation.

Conclusions

Non-inferiority studies disregard both instructions which serve as guidelines to the planning of good clinical studies, or “ask an important question; and give it a methodologically reliable answer” (17). The important question is the one which is real for the patient, therefore the one that tackles a real clinical problem. But a study planned to verify whether a medicine is “not worse” than standard treatments, without any interest in any added value, does not ask any clinically relevant question. This kind of study simply cuts research and development costs, as well as the risks for its commercial image, without a care for the patients’ interests. Randomisation should not even be allowed in such circumstances, because it is not ethical to leave to chance the possibility that a patient might receive a treatment which, in the best of cases is similar to the one that he/she would have received anyway, but could also reduce a great number of the advantages that previously had been assured to him/her by current treatment. We hope that the text of informed consent explains the concept of non-inferiority. With regards to the methodological approach and therefore the answer, the uncertainty that surrounds the conclusion of non-inferiority is difficult to accept: however small, the increase of the relative risk inevitably implies an unacceptable excess of negative events in the patients’ population. At times the risk can turn out to be significantly higher in the group subjected to the experimental treatment, however all this does not refuse the non-inferiority of such treatment (13).

In conclusion, the National Bioethics Committee recommends that non-inferiority studies are illustrated with more transparency and carefully analysed by the ethical Committees, which have to supervise in particular so that the patients’ interests are not subordinated to other interests, including the commercial interests of the sponsor.

Presidenza del Consiglio dei Ministri



**CHIMERAS AND HYBRIDS
WITH SPECIFIC ATTENTION TO CYTOPLASMIC HYBRIDS**

26th of June 2009

Introduction

The National Bioethics Committee (NBC) has approved the opinion “Chimeras and hybrids, with specific attention to cytoplasmic hybrids”.

The NBC’s opinion reflects in depth and accurately the Committee members’ opinions with regards to bioethical questions raised by the production of hybrids and chimeras, but especially by the production of cytoplasmic hybrids (cybrids), obtained through the technique of transferring the nucleus of a somatic human cell in a denucleated animal egg cell in which animal mitochondria can still be found. This technology has been the object of widespread debate in Great Britain after the authorisation issued by the Human Fertilisation and Embryology Authority (HFEA) to carry out this experiment. This is therefore a current topic that the NBC has deemed important to discuss also because of the prohibition of these practices in the Law No.40/2004 (Regulations for Medically Assisted Procreation).

There are a variety of important ethical issues involved in these new methods of intervention: some concern the evaluation of scientific research and of the reasons given to defend its practicability; others regard the question of the identity of man and of the human species considering the creation, in a laboratory, of new identities mixing human and animal genetic material. This examination also had to take into account the issue of whether cytoplasmic hybrids are human embryos or whether the presence of mitochondrial DNA of animal origin makes them non-human, an issue that has not yet found a shared response in the scientific world.

Within the Committee there are a variety of opinions, some contrary to this research, others favourable although cautious, all presented in a broad and detailed manner.

Some Committee members have raised bioethical problems with regards to the moment when the created organisms are of uncertain identity, as they lead to overcoming barriers between the human species and animal species. Therefore, those members do not think that it is ethically acceptable to scientifically experiment in this way, as it alters the identity of the human being and of the human species, even if this research is carried out in the name of the possible increase in knowledge it could bring.

Other NBC members, believing that the fact that the experiments are not greatly justified by the scientific evidence they produce does not imply their immorality and not agreeing with the thesis that the embryo in his/her very first stages of development is due absolute protection (the situation in which cybrids are not destined to develop is highlighted), do not condemn their creation. They have however recommended a transparent and rigorous control of these types of experiments, which must be carried out with a cognitive purpose.

The opinion has been coordinated and drawn up by Prof. Assunta Morresi with the contribution of the members of the working group (Prof. Isabella Coghi, Prof. Roberto Colombo, Prof. Maria Luisa Di Pietro and Prof. Lucetta Scaraffia) and with the written contributions of a variety of Committee members (Prof. Salvatore Amato, Prof. Adriano Bompiani, Prof. Roberto Colombo, Prof. Francesco D’Agostino, Prof. Lorenzo d’Avack, Prof. Carlo Flamigni, Prof. Marianna Gensabella Furnari, Prof. Demetrio Neri, Prof. Andrea Nicolussi, Prof. Laura Palazzani, Prof. Alberto Piazza, Prof. Lucetta Scaraffia, Prof. Monica Toraldo di Francia and Prof. Grazia Zuffa).

In the plenary meeting of the 26th of June 2009 the document has gained the approval of those present (Prof. Salvatore Amato, Prof. Adriano Bompiani, Prof. Roberto Colombo, Prof. Francesco D'Agostino, Prof. Bruno Dallapiccola, Prof. Antonio Da Re, Prof. Maria Luisa Di Pietro, Prof

. Riccardo Di Segni, Prof. Carlo Flamigni, Prof. Marianna Gensabella Furnari, Prof. Laura Guidoni, Prof. Aldo Isidori, Prof. Assunta Morresi, Prof. Demetrio Neri, Prof. Andrea Nicolussi, Prof. Laura Palazzani, Prof. Alberto Piazza, Prof. Vittorio Possenti, Prof. Monica Toraldo di Francia , Prof. Giancarlo Umani Ronchi, Prof. Grazia Zuffa), with the contrary vote of two members (Prof. Luisella Battaglia and Prof. Claudia Mancina). Prof. Stefano Canestrari, Prof. Lorenzo d'Avack and Prof. Silvio Garattini, absent from the meeting, expressed their agreement with the document. Prof. Luca Marini communicated his abstention.

To better clarify their reasons with regards to some issues discussed and the different conclusions reached in the opinion, two personal remarks have been added, respectively signed by Prof. Assunta Morresi and Prof. Vittorio Possenti.

The President
Prof. Francesco Paolo Casavola

Document

1. Interspecies living beings

The issue of interspecies organisms is an important chapter in the ethical debate that for decades has discussed the problem of overcoming the barrier between the different species of living beings¹.

This poses first of all the problem of defining the identity of the species: it was the use of recombinant DNA technology to raise, in the 60s and 70s, the debate on the existence of natural barriers between different species, and on the opportunity for scientists to one day overcome them².

The NBC has tackled some aspects of this argument in two documents. In the first one, "The problems of collecting and treating human seminal liquid for diagnostic purposes" (5th of May 1991), dedicated to the tests carried out for diagnostic purposes, we highlight the problem of hybridisation tests (spermatozoon's penetration in hamster eggs); in the second, "Identity and status of the human embryo" (22nd of June 1996), we unanimously state that among the "morally illicit treatments of human embryos, at any stage of their development" we must list also the "creation of chimeras; the production of human-animal hybrids; the transferral of human embryos in animal uterus or vice versa".

Currently the production of interspecies human/animal embryos is prohibited by Italian legislation (L. 40/2004, art. 13).

The NBC believes that it is important to examine the problem directly, given its relevance in the national and international debate, both in the scientific, ethical and legal field as well as in public opinion.

1.1 The problem of the species

The old definition of species, with the principles fixed by Aristotle in the IV Century BC, principles acknowledged and widened by Linneo (1707-1778) in type, order, class and kingdom has undergone – with regards to the fixist interpretation – a profound "revolution" with the Darwinian interpretation of living creatures' evolution. There are in any case (without in the document getting into a discussion on this point) a variety of difficulties if we want to adopt an omni-comprehensive definition of the concept of species on the basis of a range of parameters created in order to characterise it in various orders of living creatures (about twenty according to Scott Robert and Baylis³); the same difficulties are found when we want to investigate the mechanism of species formation (speciation).

That said, the most used criteria to define a species are the following:

¹ The NBC document does not discuss the problems regarding the creation of mixed embryos through the manipulation of genetic and/or cellular material belonging to different animal species. We refer in this case not only to the issue of the use of somatic cells, but to the experiments aimed at the artificial production of new species. The NBC proposes to return to this topic with a specific reflection, stressing the importance of this issue, also in relation to the eventual pain of the living beings obtained.

² Cf. e.g. S. Krimsky, *Genetic Alchemy: The Social History of the Recombinant DNA Controversy*, MIT Press, Cambridge 1982.

³ J. Scott Robert, F. Baylis, *Crossing species boundaries*, "Am. J. Bioeth", 2003, 3/3, pp. 1-13.

- typological (based on sharing characteristics),
- biological (based on procreative capabilities),
- evolutionistic (based on descent)⁴.

A still very widespread “popular taxonomy” allows us to classify – for practical purposes – a certain number of the most common living beings on the basis of shared typological characters.

Among modern criteria of great scientific value, it has certainly had considerable circulation the biological concept introduced by Mayr in 1940⁵ and in 1959⁶ and by Dobzhansky⁷, of species as “reproductive isolation”, or lack of genetic exchange between two populations of individuals. The concept of genetic community has then been further clarified by Simpson⁸ and by Wiley⁹ (in the Darwinian sense); the last one stresses how a species descends linearly “from an ancestral population of organisms that maintain their identity with regards to any other evolutionary line and that undertake their own evolutionary journey with an individual historical destiny”.

It was the attention to the variations found between individuals grouped according to summary typological criteria, to lead Darwin to his theory of evolution, that is, to descent with modification. This way, the species nature and reality could be realised in genealogical links and the reconstruction of philogenesis could substitute a purely descriptive classification.

In this context, which is still today full of heated debates, have emerged – especially from evolutionist biologists representatives of the post-darwinian “New Synthesis” of the early 1900 - redefinitions of the concept of species that, starting with the refusal of typologically defining species as “classes of objects” on the basis of intrinsic and arbitrarily selected characteristics, intend to stress their exclusively biological sphere, defining them as groups of natural populations, the members of which mate with each other and are reproductively isolated from other similar groups. A species is therefore a reproductive community, an ecological community and a genetic community¹⁰.

In this document we will refer to the biological concept of species so defined: a group of individuals capable of mating with each other and giving life to fertile offspring, that is, able to generate other individuals.

In conclusion, the practical usefulness of adopting each of the abovementioned criteria – which do not exclude each other but can be integrated in a synthetic vision of a living organism and of its natural history – depends on the specific problem for which we need a distinction between species. In the case of the production of cytoplasmic hybrid embryos, or cybrids (the transferral of a nuclear genome of a somatic cell of human origin in a

⁴ J.D. White, *Specie e speciazione*, in “Enciclopedia del Novecento” (Italian Institute for Italian Encyclopaedia); N. Smelser, B. Baltes, *Species and speciation*, (International Encyclopedia of the Social Behavioural Sciences, Elsevir 2001), in “The New Encyclopedia Britannic” (vol XI Micropaedia).

⁵ E. Mayr, *Speciation phenomena in birds*, “American Naturalist”, 1940, 74, pp. 249-278.

⁶ E. Mayr, *Typological versus population thinking*, in “Evolution and the Diversity of Life” (1959); Id. Cambridge Univ. Press, Cambridge 1976.

⁷ T. Dobzhansky, *Mendelian population and their evolution*, “American Naturalist”, 1950, 84, pp. 401-418.

⁸ G. Simpson, *Principles of animals taxonomy*, Columbia Univ. Press, New York 1961.

⁹ E.O. Wiley, *The evolutionary species concept reconsidered*, “Systematic Zoology”, 1978, 27, pp. 17-26.

¹⁰ E. Mayr, *Speciation phenomena in birds*, cit.

denucleated cytoplasm of animal species), the beginning of a development similar to an early embryonic development is the fruit of a biotechnological intervention and not the outcome of a phylogenetic process, so that – lacking the ability to develop further – a certain attribution of species creates problems.

There is however no doubt that the important data characterising such organisms is the co-presence, within the single cytoplasm, of a nuclear genome and of a mitochondrial genome, belonging to two organisms of different species, whatever concept of species we want to adopt.

1. Definitions and problems

There are three categories of interspecies living beings:

Chimeras: organisms containing cells with a different genetic inheritance, coming from two or more genetically distinct animals, belonging to the same species or to different species. The most common forms of human chimeras are the *artificial* ones, which originate for example from organ transplants or, provisionally, from blood transfusions, and the *natural* ones, temporary and physiological, which happen during pregnancy, because of the passage of embryo-foetal cells into the mother's stream. Much rarer are the *natural* human chimeras deriving from the fusion of embryos originated from independent conceptions or with mechanisms similar to the beginning of pregnancy.

Transgenic: organisms in which the genetic inheritance contains genes added to the original and mitochondrial nuclear DNA, intact or modified. Transgenic animals having a human gene introduced into the animal germinal line that is transmitted to the descendants' cells, can be used to produce substances of potential therapeutic interest and as a model for the study of human illnesses¹¹.

Hybrids: organisms in which all the cells share the same genetic inheritance, originated by crossing different species. Generally they are obtained by fertilising animals belonging to different species: the mule is probably the best known hybrid animal in nature. The concept of hybrid however is used in biology also, for example, to indicate a cellular population originated by the fusion of cells of subjects belonging to different species (somatic cells hybrids).

In more recent scientific literature there are a variety of examples of hybrids, the development of which does not go beyond the first cellular divisions:

1. mixed embryos, man/animal;
or possible chimerisms from the introduction of:
2. animal cells transplanted in human embryos or foetuses;

¹¹ Another definition of transgenic is the following: "an organism's genetic inheritance containing hexogen genes inserted in the nuclear DNA, intact or modified", because genes cannot be "added" to the nuclear DNA and even less to the mitochondrial DNA that, being transmittable only through the maternal line, do not have, in the experiments in which they are used, any interest, either experimental or therapeutic.

3. human cells transplanted in animal embryos or foetuses.

Case 1. is exemplified by animal oocytes (rabbit), denucleated, fused with a cell from human skin, as indicated by Chen et al.¹²: when the blastocyst state is reached (5-7 days), the cells behaving like stem cells, differentiating in different populations, including neuroblasts and myoblasts, are isolated. These experiments have been discussed by the Scottish Bioethics Committee¹³, which has raised doubts about their ethical aspects. Similar experiments have been reported by Illmensee et al.¹⁴, who have fused denucleated cow oocytes with ovary granulose cells or with skin fibroblasts. Some of these fusions have created blastocysts after six days^{13, 15}.

Case 2. according to Mikkelsen¹⁶ has not yet been found in literature.

Case 3. is the one most commonly found. According to Mikkelsen¹⁶, transplants of embryonic human stem cells in mouse or other animal blastocysts have not been described. Instead, numerous experiments of stem cells transplant in animal foetuses, including human stem cells obtained from tissue (or in any case more differentiated sources). For example, Ogle et al.¹⁷ introduced human hematopoietic stem cells in pig foetuses and observed both unmodified human cells and human cells fused with pig cells, in a 40:60 proportion. The same phenomenon has also been observed in other chimerical animals¹⁸. Moutri et al.¹⁹ transplanted human embryonic stem cells into the cerebral ventricles of murine foetuses, in order to study their ability to differentiate in neuronal cells, and observed the formation of synapses between the two neuronal populations, at different levels of cerebral architecture (cortex, hippocampus, thalamus and cerebellum). The overall population of human derivation has been estimated to about 0.1%. Bruestle et al.²⁰ transplanted cerebral stem cells of human foetuses, 53 and 74 days old, in the ventricles of rat foetuses (17-18 days old). Eight weeks after the transplant, human cells were incorporated in a variety of the guest's cerebral areas (amongst other, in the cortex, in the hippocampus and in the olfactory bulb), where they differentiated in astrocytes, oligodendrocytes and neurons. Zanjani et al. in 1995²¹ and in 1996²² implanted hepatic cells of human foetuses, 12 and 15

¹² Y. Chen et al., *Embryonic stem cells generated by nuclear transfer of human somatic nuclei into rabbit oocytes*, "Cell Research", 2003, 13, pp. 251-264.

¹³ Scottish Council on Human Bioethics, *Embryonic, foetal and post-natal animal. Human mixtures*, 2005.

¹⁴ K. Illmensee et al., *Evaluation of the embryonic preimplementation potential of human adult somatic cells via an embryo interspecies bioassay using bovine oocytes*, "Fertil. Steril.", 2006, 85, suppl. 1, pp. 1248-1260.

¹⁵ P.M. Zavos, *Human reproductive cloning: the time is near*, "Reproduc., Biomed., Online", 2003, 6, pp. 397-398.

¹⁶ T.R. Mikkelsen, *Examples of Scientific Articles about Animal-Human Hybrids and Animal-Human Chimeras*, in "Man or Mouse?", The Danish Council of Ethics, Report on Ethical aspects of chimeras research, 2008.

¹⁷ B.M. Ogle et al., *Spontaneous fusion of cells between species yields transdifferentiation and retroviral transfer in vivo*, "Faseb J.", 2004, 18, pp. 548-550.

¹⁸ B.M. Ogle et al., *Biological implications of cell fusion* "Nat. Rev. Mol. Cell. Biol.", 2005, 6, pp. 567-575.

¹⁹ A.R. Moutri et al., *Development of functional human embryonic stem cell-derived neurons in mouse brain*, "Proc. N. Acad. Sci.", 2005, USA 102, pp. 18644-18648.

²⁰ O. Bruestle et al., *Chimeric brains generated by intraventricular transplantation of fetal human brain cells into embryonic rats*, "Nature Biotechnology", 16, pp.1040-1044.

²¹ E.D. Zanjani et al., *Retention and multilineage expression of human haematopoietic stem cells in human-sheep chimeras*, "Stem Cells", 1995, 13, pp. 101-111.

weeks old, into sheep fetuses. A few years after the transplant, the 10-20% of hematopoietic cells was of human origin. Almeida-Porada et al. in 1999²³ and in 2005²⁴ transplanted human neuronal stem cells in ovine fetuses, and at birth (after three months) they observed that transplanted human cells had originated hematopoietic, marrow, hepatic, thymic and spleen cells. The experiment demonstrated the versatility of differentiation in neuronal human cells. Ourednick et al.²⁵ transplanted neuronal cells taken from a 15-week old human fetus, into a “macaca radiata” (Bonnet Macaque). After 16-17 weeks from the transplant, human cells had reproduced and colonised some distant cerebral areas, although in a reduced number.

The examples cited (not mentioning other experiments involving the transplant of human cells from adult organisms in embryos or in animal fetuses) indicate the possibility of creating man-animal interspecies chimeras, with characteristics of relative stability in time. Each of the two populations deriving from the different species, although they remain isolated, appear to be immunologically tolerated during the observation period. The percentage of human population is in any case very limited.

Chimeras, transgenic and hybrids can raise ethical problems. At the same time, there is widespread agreement with regards to some typologies of man/animal chimeras²⁶: there is agreement, for example, on the fact that the

²² E.D. Zanjani et al., *The human/sheep xenograft model: a large animal model of human haematopoiesis*, “Int. J. Hematol.”, 1996, 63, pp. 179-192.

²³ G. Almeida-Porada et al., *Transplantation of human neuronal stem cells into fetal sheep give rise to hematopoietic cells in vivo*, “Blood”, 1999, 94, 129a.

²⁴ G. Almeida-Porada et al., *In vivo haematopoietic potential of human neural stem cells*, “Brit. J. Haematol”, 2005, 130, pp. 276-283.

²⁵ V. Ourednik et al., *Segregation of human neural stem cells in the developing primate forebrain*, “Science”, 2001, 293, pp. 1820-1824.

²⁶ Some members believe that these experiments are legitimate only when they do not cause useless suffering and harm to animals. In particular, Prof. Luisella Battaglia highlights what follows:

Tackling the issue of transgenic animals means taking seriously the bioethical aspects of science and technology, the consequences in the short, medium and long term, for the health and well-being of the subjects involved and for society overall; finally, questioning the development model we are pursuing and its pitfalls, not only with regards to man but also to the environment intended in its totality. In the bioethical debate on transgenic animal we see the clash between two philosophies that, in extreme synthesis, could be so characterised: one has a vision of animals as instruments and simple means of a scientific-technological process, strictly aimed at human well-being; the other seen in those not human, subjects that have abilities, needs and interests, deserving of careful consideration and worthy of respect and protection.

In the NBC’s document, *Ethical and legal considerations on the use of biotechnologies* (30th of November 2001) we see a cautious support of the second perspective. With regards to the patentability of living beings, after recalling that animals with modified genetic characteristics are patentable, if they meet precise objectives of research and biomedical use, the important bioethical principle of “preservation of well-being” is introduced. According to this principle, formulated by the physiologist and philosopher Bernard Rollin, all animal genetically engineered for human use or for environmental usefulness, should not, after the modification of their genetic inheritance, have a worse quality of life than the one they would have had before the intervention or without the intervention.

This is a significant innovation in comparison to previous documents on the topic of animal bioethics, as it is a firmer statement of an ethics of responsibility towards non-humans. In fact, it is not simply a bioethical evaluation of the type of biotechnological intervention, but it requires a precise attitude of care towards animal well-being.

In this regards, it is greatly significant that in the document we read: “For interventions on plants and animals we add the principle of conservation of biological balance based on biodiversity

insertion of human cells in animal guinea pigs during scientific experimentations, or the use of organs from genetically modified animals (transgenic animals) or parts of them, for treating the inadequacy of a human organ, are ethically acceptable and belong to the issues of human and/or animal experimentation²⁷. With regards to chimeras, for better identifying the critical issues from an ethical point of view, it can be useful to distinguish between those that are man/animal, formed adding cells in an advanced stage of development, and those in which cells are transplanted in embryos in the first stages of development. In the first case, cells do not have the opportunity to develop, differentiate and spread into the organism, the way it can instead happen in the very first stages of development, and the identity of the chimeric organism remains well defined (like, for example, in organ or tissue transplants).

However, some of these experiments can raise ethical problems, in particular when the cells transplanted in adults are neuroblasts or germinal cells. For example in 2005, during a research on Parkinson disease, neuronal stem cells taken from a 13-week old human foetus were transplanted into the cerebral area of an African green monkey, in which dopamine producing neurons had been destroyed. After 7 months, the transplanted cells worked and had partially substituted the ones that had been destroyed²⁸. Attempts at cell transplants capable of developing into germinal cells, from man to animal, are also known, aiming at producing, in animals, human germinal cells. The examples of cell transplants capable of developing in spermatozoons, from human testicles to mouse testicles made immunodeficient²⁹, or from human ovary to mice³⁰, are significant. If these experiments had been successful, murine testicles would have produced human and murine spermatozoons, human oocytes would have developed in chimeric mice, and, in theory, human embryos could have been obtained from animals capable of producing human gametes.

The problem of the identity of the new living being always presents itself when the man/animal chimeras are formed in the very first stages of embryo-foetal development – when transplanted cells can develop and spread in the new organism, modifying it substantially – and in all man/animal hybrids. These can be distinguished in two groups: hybrids formed by the fusion of a human gamete with an animal (moreover, as a rule, these are impossible because of the interspecies barriers, which in effect prevent any development subsequent to this cross-fertilisation) and the cybrids, or cytoplasmic hybrids, obtained by

and the consideration of “animal rights” and of the duties and responsibilities towards them. We must critically evaluate genetic engineering interventions also from the point of view of animal well-being and identify appropriate regulations to guarantee that such interventions meet the new emerging ethics, characterised by a growing consideration for animal suffering and by the intent of preventing and alleviating their burden as much as possible. Those working in genetic engineering should therefore seriously respect the social request of reducing the pain, the anxiety and any kind of suffering of the manipulated animals”.

²⁷ President’s Council on Bioethics, *Reproduction and responsibility: the regulation of new biotechnologies*, USA, 2004.

²⁸ K.B. Bjugstad et al., *Neural stem cells implanted into MPTP-treated monkeys increase the size of endogenous tyrosine hydroxylase-positive cells found in the striatum: a return to control measure*, “Cell Transplant”, 2005, 14, pp. 183-192.

²⁹ M.M. Reis et al., *Xenogeneic transplantation of human spermatogonia*, “Zygote”, 2008, 8, pp. 97-105.

³⁰ Y. Aubard, *Ovarian tissue xenografting*, “Eur. J. Obstet. Gynecol. Reprod. Biol.”, 2003, 108, pp. 14-18.

transferring the nucleus, inserting the nucleus of a human somatic cell in an animal denucleated egg cell.

In theory, transgenic human embryos can be produced, that is, human embryos in which animal genes are inserted: in this case, very different situations can occur, depending on the inserted genome.

In general, the advent of new reproductive technologies has made us reconsider the definition of human being as the result of natural fertilisation, that is, of the fusion of male and female gametes: the possibility of creating hybrid or cybrid embryos has opened the opportunity of thinking about new life forms, unlike the ones already known.

The possibilities of man/animal combination are therefore different and present a variety of ethical problems; in any case we have the problem of defining what is human. In particular it is necessary to understand if a chimeric, transgenic or hybrid living being, created in a laboratory through the fusion of human and non-human cells, has characteristics that can define it as “human”.

In reality, for some NBC members³¹ the most complex problem is not so much the missing of human and animal tissues and cells, but the creation, through the formation of man/animal hybrids and chimeras, of living beings of uncertain identity, in which the boundary between the human and the animal species is no longer identifiable.

Other NBC members³² however, consider the concept of “uncertain identity” quite obscure, especially because the identity’s “uncertainty” is not substantiated by any reference to any measurement criteria. It seems instead, on the one hand, that such uncertainty – following what has been stated above – cannot depend on the mere combination of biological material; and, on the other hand, that it refers to – as it can be understood by the use of the adjective “visible” – a kind of “intuitive recognition” in deciding whether the new “being” does not belong to the human species. In any case, the biggest perplexity derives from the application of the concept of “identity” to the cybrids, as it is not clear what type of identity we are referring to. If we want to consider only genetic identity, then it would not be uncertain, because it is defined by the procedure used to form the cybrids. It therefore seems that we are considering, at least implicitly, the historical-cultural and psychological-social aspects, in which the concept of identity is really rooted. However, the centre of the concept of identity rotates around the subjectivity and the discourse of the subject on itself. Therefore it is evident that the difficulty of applying this concept to the cybrids, destined not to develop, unless we assimilate *tout court* the embryo to the “living human being”, so that genetic individuality and human individuality coincide, a thesis that is ethically controversial (and not shared by the abovementioned members).

Bioethical issues connected to the production of interspecies living beings, which include not only the status of the human embryo, but also the question of the species’ identity and of the definition of human, are common to all man/animal interspecies living beings described in previous paragraphs. At the same time, each form of interspecies living being implies also specific considerations, relative to the methods with which it was produced, to its development and its purpose.

³¹ S. Amato, A Bompiani, R. Colombo, A. Da Re, F. D’ Agostino, B. Dallapiccola, M.L. Di Pietro, M. Gensabella, A. Isidori, A. Morresi, A. Nicolussi, L. Palazzani, V. Possenti, R. Proietti, L. Scaraffia.

³² C. Flamigni, S. Garattini, D. Neri, A. Piazza, M. Toraldo di Francia, G. Zuffa.

In this document the NBC examines in detail only one form of interspecies living being, that is, cytoplasmic hybrid embryos, or cybrids, because:

- currently it seems to be one of the possibilities, maybe the only one, in line with the cloning project through the nuclear transplant for therapeutic purposes;
- the protocol followed in creating this hybrids is sufficiently standardised to be reproduced in a laboratory; the organisms derived can be described only from a genetic point of view, although still, for some NBC members³³ remains the problem of their uncertain identity.

The paragraph dedicated to bioethical reflection, refers in particular to the creation of cybrids and, in general, to the creation of interspecies organisms; conclusive bioethical considerations and the legal part (in appendix), for the arguments and the problems tackled, are applied to all man/animal interspecies organisms.

2. Cytoplasmic hybrid embryos

Commonly known with the expression “therapeutic cloning”, the SCNT technique (Somatic Cell Nuclear Transfer) allows us, theoretically, to create embryos with the genetic inheritance of an adult individual, using only one gamete. This protocol involves the removal of an egg cell’s nucleus, which is then substituted with the nucleus taken from a man adult somatic cell of the same species. Appropriately stimulated – chemically and/or electrically – this new cell can behave as a fertilised oocyte and can divide and differentiate until it originates a new organism, which has the same nuclear genetic inheritance of the donor’s adult somatic cell.³⁴

The main purpose of this technique is to obtain cellular lines and, consequently, human tissues, compatible to the donor and, theoretically, useful for eventual medical applications and, first of all, for the substitution of tissues damaged by degenerative diseases (like, for example, Parkinson disease), without having any rejection problems. This is a possible application of regenerative medicine. Another purpose of these experiments is simply of a cognitive nature, that is, aimed at exploring the mechanisms of cellular reprogramming mediated by the egg cell’s cytoplasm. The SCNT can also be seen as a technique that allows us to reprogram and therefore “rejuvenate” an adult cell to its embryonic stage, through not yet clear mechanisms that involve the activation of some genes.

³³ S. Amato, A. Bompiani, R. Colombo, A. Da Re, F. D’Agostino, B. Dallapiccola, M.L. Di Pietro, M. Gensabella, A. Isidori, A. Morresi, A. Nicolussi, L. Palazzani, V. Possenti, R. Proietti, L. Scaraffia.

³⁴ However it’s not a perfectly identical copy: the oocyte contains mitochondria - small structures responsible, amongst other things, for the cellular energetic cycle – which have their own genetic inheritance, present in the new embryo in different quantities, according to the methods of transferral of the nucleus from the donor to the enucleated oocyte. The term heteroplasma indicates the presence of mitochondrial DNA with a different genetic make-up, for example the mixture of the egg’s and the donor’s mitochondrial DNA, because of the transferral of a residue of the adult somatic cell’s cytoplasm: in this case, both the mitochondria of the somatic cell’s donor and those of the individual who has given the oocyte, can be found in the new embryo.

Some NBC members³⁵ observe that the use of SCNT to get autologous cells (that is, compatible to the nucleus' donor) to use in regenerative medicine, would have a very limited value in therapy, especially in the case of illnesses (like Parkinson disease) with a strong genetic component. In fact, the cells so obtained contain the genes that caused or contributed to cause the illness, and some scientists³⁶ have been asking themselves for some time if the advantage of the autologous stem cells' compatibility (however obtained) is not strongly put into perspective by the fact that the use of these cells in transplants, in the case of illnesses with a high genetic component, means reintroducing the cause of the illness into the patient. Different is instead – still according to those NBC members – the evaluation of the use of this technique (on human or animal oocytes) in base research, where it can lead to the acquisition of knowledge regarding the processes of normal and pathological development which cannot currently be gained in other ways.

12 years from the cloning of Dolly, SCNT's efficiency seems very limited. The percentages of full term pregnancies for cloned animals is 1-2%, as they are penalised by a high incidence of abortions and still-births³⁷, whilst, according to what we know today, the technique has not produced results on man and, in particular, lines of human embryonic stem cells obtained from cloned human embryos are not available. The Korean vet Hwang Woo Suk³⁸ declared that he had been able to achieve human cloning with this technique, but subsequently his work was revealed to be “the greatest scientific fraud of the century”³⁹.

³⁵ C. Flamigni, S. Garattini, D. Neri, A. Piazza; M. Toraldo di Francia, G. Zuffa.

³⁶ Cf. H.I. Park, *Global gene and cell replacement strategies via stem cells*, “Gene Therapy”, 2002, 9, p. 623; E. Snyder, A. Vescovi, *The possibilities/perplexities of stem cells*, “Nature Biotechnology”, 18th of August 2000, pp. 927-828.

³⁷ L. Loi, *Dieci anni di cloni e di fibrillazioni*, “Darwin”, 2007, 21, pp. 54-59, and cited references.

³⁸ In May 2005 the journal “Science” published an article illustrating how the medical team led by Hwang (45 direct collaborators and 183 researchers in total, 26.5 million dollars received as funds in the first six months of 2005, 65 millions dollars in total invested by the Korean government) had obtained 11 embryonic stem lines compatible with some patients affected by different pathologies (diabetes, spinal cord lesions, immunodeficiency). But in the following months it was discovered that the results had been falsified, that no cloning had happened, and that the oocytes used were not 185, donated by volunteers, but more than 2,000, some of which obtained from female researchers within the same Hwang research group, through pressure and payment.

³⁹ “The Korean stem cell research star Woo Suk Hwang is at the centre of one of the largest investigations of scientific fraud in living memory”, in www.nature.com/news/specials/hwang/index.html; “...making it, by number of active fabricators, the biggest case of scientific fraud in history...”, Cynthia Fox, in “Fortune”, December 22, 2006; “Some analysts are describing his fall from grace as one of the biggest cases of scientific fraud in recent history”, <http://news.bbc.co.uk/2/hi/asia-pacific/4597416.stm>; “Medical researchers say the episode, which has shocked and shamed many South Koreans, is one of the biggest cases of scientific fraud in recent history”, ABC news 11.6.2006 in <http://www.abc.net.au/news/stories/2006/01/11/1545956.htm>; “Ironie de l'histoire, la plus grande fraude scientifique de l'époque moderne masquait...”, Michel de Pracontal, in *Le Nouvel Observateur*, n. 2234, 30 agosto 2007; “Responsable de la plus grande fraude scientifique de ces dernières années sur le clonage, le généticien coréen Hwang Woo-suk...”, in *l'Express*, 19.1.2009, in http://www.lexpress.fr/actualite/sciences/decouverte/ce-soir-on-mange-du-clone_479339.html; “...die viele Experten als größten Forschungsskandal des Jahrhunderts bezeichnen...”, “Die Ziet” 16 febbraio 2006, n. .8; even more damning the definition of “La verdad”: “El gran fiasco ha sido el fraude del coreano Woo Suk Hwang”, in http://www.laverdad.es/murcia/prensa/20061227/sociedad/avances-cientificos_20061227.html.

Although specialised literature is quite sceptical towards the SCNT, many believe that the lack of results with regards to man is due to the scarce availability of human oocytes. From this derives the hypothesis of taking oocytes from different animal species, available in theoretically unlimited quantity, which could be used without technical and ethical problems⁴⁰. But the SCNT technique that uses animal oocytes produces biologically new “entities”, with a human genetic inheritance that is limited to the nuclear DNA, and animal genetic inheritance with regards to mitochondrial DNA.

Improperly defined by the media as chimeric embryos, or confused with real chimeric embryos, in effect these embryos are cytoplasmic hybrids, or cybrids. The international debate in the last few years has focused on this type of interspecies embryos.

At the moment of drawing up this document, the new nuclear “reprogramming” techniques defined by the Japanese researcher Shinya Yamanaka for the production of induced pluripotent cells (iPS or induction of Pluripotent Stem cell), appear in some ways more promising and efficient in comparison to the SCNT, and have contributed in increasing the doubts about the usefulness, from a therapeutic point of view, of nuclear transfer techniques aimed at obtaining lines of embryonic stem cells⁴¹. We must however clarify that it is not completely clear if the iPS are really induced from differentiated cells⁴²; what is certain is that they are not cells identical to embryonic stem cells, as demonstrated by the studies of genic expression and of DNA methylation;⁴³ what is not clear is the system that determines their reprogramming, as some genes originally believed to be essential for this process have subsequently been found to be unnecessary or not relevant⁴⁴; finally, the iPS present safety issues from a therapeutic point of view, as all the factors relevant in the reprogramming are oncogenes and their hyper-expression is associated to tumorigenesis⁴⁵.

⁴⁰ For example, cow oocytes can be obtained directly from slaughtered animals, without any preliminary treatments. Non-human primates, however, need ovary stimulation like humans.

⁴¹ K Takahashi and S. Yamanaka, *Induction of pluripotent stem cells from mouse embryonic and adult fibroblast cultures by defined factors*, “Cell”, 2006, 126, 663-676; K. Takahashi et al., *Induction of pluripotent stem cells from adult human fibroblasts by defined factors*, “Cell”, 2007, 131, 861-872; M. Nakagawa et al., *Generation of induced pluripotent stem cells without myc from mouse and human fibroblasts* “Nat Biotechnol.”, 2008, 26, pp. 101-106; K. Okita et al., *Generation of mouse induced pluripotent stem cells without viral vectors* “Science”, 2008, 322, pp. 949-953. Currently the three research projects on cybrids that have obtained the HFEA licence, have not been funded by the United Kingdom authorities, which declared that, one of the most promising research, and therefore worthy of funds, is that on induced pluripotent stem cells.: “The Guardian”, 13.1.2009 <http://www.guardian.co.uk/science/2009/jan/13/hybrid-embryos-stem-cells>, “The Independent”, 13.1.2009, <http://www.independent.co.uk/news/science/funding-halted-for-stem-cell-research-1332000.html>; <http://www.independent.co.uk/news/science/mps-to-investigate-stem-cell-funding-row-1334254.html>.

⁴² T. Aoi, et al., *Generation of pluripotent stem cells from adult mouse liver and stomach cells*, “Science”, 2008, 321 (5889), pp. 699-702; M.F. Pera et al., *Simpler and safer cell reprogramming*, “Nature Biotechnol.” 2008, 26, pp. 59-60.

⁴³ K. Takahaschi, and S. Yamanaka, “Cell”, 2006, op. cit. in ref. 37.

⁴⁴ S.V. Liu, *iPS cells: a more critical review*, “Stem Cells and development”, 2008, 17, pp. 391-397.

⁴⁵ S.V. Liu, *iPS cells are man-made cancer cells*, “Logical Biology” 2008, 8, pp. 16-18.

3.1 The state of the art

Only one scientific publication states that the production of cybrids through SCNT can be done. An experiment of this type was published in 2003 by the journal *Cell Research*⁴⁶, but no-one yet has been able to reproduce these results, including the authors of the first publication, so that a series of doubts about the scientific validity of the first experiment have emerged.

On the other hand, different experts in the sector explain that the development of these organisms is destined to stop too early⁴⁷. The causes seem to depend on the role of the egg cell in embryonic development, in particular, with regards to the maternal-zygotic transition, that is, the transition of the program of development from the oocyte to the zygote⁴⁸ and to the role of mitochondria⁴⁹.

One of the main aims, for the researchers interested in the SCNT problem and in the formation of cybrids, is the study of mitochondrial illnesses, a sought-for sector of the research that investigates in particular the possibility of substituting mitochondria in oocytes of women affected by these illnesses.

With this purpose, the technique of the “cytoplasmic transferral” (“mitochondria donation”) from an egg cell to another has been developed. The cycles of in vitro fertilisation that used egg cells in which the mitochondria transferral had taken place, have also created fetuses and new-borns who presented development pathologies and genetic anomalies: this research has been suspended in the USA since July 2001, on FDA request⁵⁰.

⁴⁶ The foreskin cells of two five year old children, the skin of a 60 year old woman and of two men were fused with rabbit oocytes. Of the 400 embryos created, about 100 arrived to the blastocyst stage, that is, they could give embryonic stem cells, from which cellular lines could be originated, ref. [12].

⁴⁷ Robert Lanza (in Andy Coghlan, *Human-animal “cybrids” may not be possible*, “New Sci.”, 2007, 2621) of the Advanced Cell Technology, declared that his team worked for a long time to obtain this type of embryos, but without success: arrived at the stage of 16 cells, the one immediately before the blastocyst, the development has always stopped, probably, according to Lanza, for the incompatibility of the genetic inheritance of different species, which would stop “talking to each other”. But also C.A. Redi, Scientific Director of the IRCSS Foundation at the Policlinico San Matteo in Pavia, explains “cellular replication is regulated by species-specific enzymes: having joined two different species, the enzymes are different, with the consequence that the reaction after a few days is destined to physiologically stop, for the impossibility of “communicating” “[...] Having been joined, the cytoplasm and the nucleus of two different species and types, this process is destined to stop very soon” (“Repubblica e salute”, 5.6.2008).

⁴⁸ R.M. Schultz, *The molecular foundations of the maternal to zygotic transition in the preimplantation embryo* “Human Reprod. Update”, 2002, 8, pp. 323-331 and cited references; M. Zurita et al. *From the beginning: the basal transcription machinery and onset of transcription in the early animal embryo*, “Cell. Mol. Life Sci.”, 2008, 65, pp. 212-227 and cited references.

⁴⁹ R. Dumollard et al., *The role of mitochondrial function in the oocyte and embryo*, “Curr. Topics in Develop. Biol.”, 2007, 77, pp. 21-49, and rif. cit.; P. May-Panloup et al., *Mitochondrial DNA in the oocyte and the developing embryo* “Curr. Topics in Develop. Biol.”, 2007, 77, pp. 51-83, and cited references.; E. A. Shoubridge et al., *Mitochondrial DNA and the mammalian oocyte*, “Curr. Topics in Develop. Biol.”, 2007, 77, pp. 87-111 and cited references.

⁵⁰ “One centre in the USA has performed 33 IVF cycles involving CT since 1996 resulting in the birth of 16 babies. Another fetus was electively reduced (the twin delivered normally later) due to an anomaly of the sex chromosomes called Turner’s Syndrome. One early spontaneous miscarriage also occurred and the foetus was diagnosed with the same syndrome. The children born after IVF with cytoplasmic transfer have been evaluated and one 18-month-old child was recently diagnosed with a pervasive development disorder. Two babies have been born in whom mitochondria were derived from the mother as well as from the donor. This research has been suspended in the USA since early July 2001, pending clarification of new requirements

The document “Interspecies embryos” of the English Medical Academy, which is in favour of the creation of this type of hybrid embryos, states: “in the context of cytoplasmic hybrid embryos, mitochondria and cytoplasm represent potential retrovirus sources within the animal oocyte. [...] The nuclear genome of cows and rabbits contains the endogen retroviral genome. It is therefore possible that the cytoplasm of rabbit or bovine oocytes can contain transcripts (of RNA) or express endogen retrovirus codified by their nuclear genome. These viruses could reintegrate in the transferred human nucleus. This occurrence must be considered highly improbable but not impossible”. The same document suggests the preventive assessment of the existence of “expression profiles of endogen retroviruses” (that is, the expression of any retrovirus) before using the oocytes, and it stresses that, for the same reasons, stem cell lines so produced could not in any case be used for clinical treatments. The English Medical Academy also stated that in standard conditions of safety there would be no problem⁵¹. Different hearings – written and oral – given by the Science and Technology Committee⁵² highlighted the same problem, so that the potential use of these cells for in vitro studies emerged, but not for in vivo experimentation.

Some NBC members⁵³ stress that the eventual clinical application of stem cells derived from hybrids (as with any other type of stem cell) on human beings, will have to undergo the provisions contained in the recent “Regulation (EC) Number 1394/2007 of the European Parliament and of the Council on Advanced therapy medicinal product”. Looking out for problems regarding biosecurity involves, therefore, the eventual clinical application of the products, which will not be allowed until the procedures to obtain these products (and the products themselves) are not shown to be free from risks to human health. According to the same NBC members, all this has nothing to do with the experiments as long as they are confined to the laboratory or are used as an instrument to investigate specific biological issues.

Bioethical evaluations

NBC members⁵⁴ started from two different types of ethical considerations:

- I. some concern the evaluation of scientific research and of the reasons given to defend its practicability;
- II. others refer, instead, to the issue of the identity of man and of the human species.

suggested by the federal Food and Drug Administration (FDA).” (Hfea, Scientific and Clinic Advanced Group, Mitochondria and Development, 16.7.2005).

⁵¹ *Inter Species Embryos*, A report by Academy of Medical Science, June 2007, in <http://www.acmedsci.ac.uk/p47prid51.html>

⁵² Science and Technology Committee, UK Parliament, Fifth Report of session 2006/07; Government proposal for the regulation of hybrid and chimera embryos, 5.4.2007, in http://www.parliament.uk/parliamentary_committees/science_and_technology_committee/science_and_technology_committee_reports_and_publications.cfm

⁵³ C. Flamigni, S. Garattini, D. Neri, A. Piazza, M. Toraldo di Francia, G. Zuffa.

⁵⁴ S. Amato, A. Bompiani, R. Colombo, A. Da Re, F. D’Agostino, B. Dallapiccola, M.L. Di Pietro, M. Gensabella, A. Isidori, A. Morresi, L.Palazzani, V.Possenti, L.Proietti, L.Scaraffia; A.Nicolussi adheres to the ethical reasons sub II, 1,2,3.

I. The ethical value of the experimentations cannot be considered apart from its strictly scientific relevance: from this point of view, any research that is futile, highly and unnecessarily risky or undeservedly costly can be also ethically criticised. In determining the scientific value of research we must assess – as well as its hypothesis' usefulness or interest – also its intrinsic value, in comparison to what we already know.

Starting from this premise, with regards to cytoplasmic hybrid embryos, the following observations have been put forward.

- The scientific literature available indicates that the cytoplasmic hybrids produced do not survive up to a stage that allows us to recover embryonic stem cells.

- The high degree of developmental defects and anomalies that characterises the majority of cloned animals, brings into question the quality of stem cells that eventually could be obtained from this type of embryos; on the other hand, cells with genetic anomalies would not be useful or would have limited use, as models for the study of an illness, and could not have any therapeutic application.

- Even hypothesising that embryonic stem cells could be removed from cybrids and that they had no anomalies, they would not have any therapeutic relevance for man, because of their contamination with animal material. In the same way, they would have limited or no relevance in the study of illnesses, because the results would be extremely difficult to interpret, as it would be an unknown cellular model.

- The human derivation of the nuclear genetic information and the animal information of the mitochondrial genome makes the clinical transferral of this type of experimental model problematic, as it also potentially carries the risk of an interspecies transmission of viral agents.

- If the purpose of these studies is an improvement in our knowledge of cybrids, and/or the failure of cellular reprogramming in the egg cell, similar experiments could be designed using biological material of exclusively animal origin, intraspecies or interspecies, although ethical caution and ethical problems would remain, which have to be considered even in animal research. Cloning has a very low efficacy even in animals belonging to the same species: it would therefore be logical to tackle the technical and bioethical problem of cellular reprogramming through the transferral of the nucleus, starting with animal models.

For these NBC members, therefore, the abovementioned reasons make the studies on cytoplasmic hybrids scarcely justifiable at the moment. Also, we stress how the reasons given by researchers⁵⁵ in the current debate in support of the justifiability of this practice, are not sufficient for a variety of reasons:

a) the fact that it would produce a hybrid cellular population, the development of which spontaneously stops or, in any case, is interrupted by researchers and is not transferred to the maternal body, is not sufficient to make this practice legitimate: we must in fact face the responsibility of producing these entities. In addition, not interrupting their development would open the possibility of introducing variable percentages of animal genetic material or of liberalising other forms of interspecies fertilisation, even with the

⁵⁵ Only the following arguments under a) and b) have been recalled in the HFEA document, *Hybrids and Chimeras Consultation document*, October 2007; House of Commons, Science and technology Committee, Fifth report, Government proposal for regulation of hybrid and chimera embryos, 5 April 2007.

possible intention of transferring such hybrid cellular populations in the human or animal body;

b) the fact that researchers produce cybrids because of the low availability of human oocytes, in order to avoid subjecting women to the risks of hormone hyper-stimulation, does not constitute a scientifically and ethically sufficient argument: experimentation not only must not expose women, but also the subject on which the experimentation is carried out, to any risks, and in any case it must answer general scientific and ethical criteria.

c) It must also be highlighted that the objective of this research is to increase the efficacy of cloning, in a perspective of human application. If this aim was achieved, the intention declared by the researchers would be to still continue the research on embryonic cells derived from SCNT, but using human oocytes, as the stem cells eventually obtained from cybrids would not be useful for therapeutic purposes. What would follow, is the paradox of an increase in the demand of human oocytes and, if the technique was successful, the demand would end up subjecting women to much greater pressures and coercions than the ones they face today to persuade them to give their oocytes⁵⁶.

II. Those same members have also put forward other ethical, more general reasons with regards to illegitimacy of such practices, which can be referred to any type of interspecies hybrid and to some chimeras and man/animal transgenics (see par. 2). These can be articulated in three points.

1. The first ethical reason is given by the protection of the dignity of the human embryo from the beginning of his/her life as well as the integrity of the human species.

Looking into this, the issue of whether cytoplasmic hybrids are *human* embryos or whether the presence of mitochondrial DNA of animal origin makes them *non-human*, has not yet found a shared response.

However, the simple existence of a reasonable doubt about the *status* of cybrids, reopens the question of the dignity of the human embryo. If, in fact, they are human embryos, there are a variety of issues: if it is legitimate, in principle, to create them for research purposes; if it is justifiable to destroy them within a certain date, after having studied them and having eventually taken out their stem cells. This reopens a debate the NBC has already taken part in numerous times, recording divergent opinions⁵⁷.

Even if science was able to demonstrate the efficacy or the usefulness of some of these experiments and of their applications, the mixture of even a *quantitatively* low percentage of animal genetic material with human genetic material, would qualitatively damage the identity of the embryo and of the human species, with evident pitfalls with regards to the protection of the dignity of the first and the integrity of the second. The fact that the development of cybrids is destined to stop, is not proof that there is no development, but instead confirms it; the fact that cybrids cannot be implanted or are not implanted, does not ethically justify the experimentation, as such entities are

⁵⁶ F. Baylis, *Animal eggs for human embryonic stem cell research: A path not worth taking*, "Am. J. Bioethics", 2008, 8, pp. 18-32.

⁵⁷ *The Identity and Status of Human Embryos*, 1996; *Opinion on the Therapeutic Use of Stem Cells*, 2000; *Opinion on the Research Using Stem Embryos and Cells*, 2003; *Opinion on the Destiny of Human Embryos Resulting from MAP and not Complying with the Conditions for Implantation*, 2007.

intentionally produced for experimental purposes; the fact that they are “destined to die” does not make them less worthy. In particular, the planned destruction of human/animal mixed embryos, highlights a contradiction in those who state that these are only cellular artefacts: why stop their development on the 14th day of conception, as it happens for human embryos created for research purposes? If one of the objectives is to increase the knowledge that can derive from this type of organisms, and if this is a sufficiently legitimate aim, why not allow their growth and development, as it happens for the creation of genetically modified animal species?

The production of man/animal mixed embryos is not acceptable because it implies a radical manipulation of the human being, so that his nature is uncertain and it prevents us to recognise him as belonging to the human species. The recognition of human supremacy on other living beings is not a speciesist anthropocentric prejudice, but the acknowledgment of the importance of man not only because of his peculiar genetic characteristics, but also because of the potential and natural abilities he has developed, during the history of his evolution, amongst which⁵⁸ language, moral intelligence and the discrimination between right and wrong⁵⁹, free will or cultural elaboration⁶⁰, and other characteristics.

The overcoming of the barriers between species, through the use of technologies, alters the natural order and could lead to the possible degradation of the identity of man, violating his intrinsic dignity.

Even those who don't agree with the full protection of the human embryo can however feel that it is necessary to safeguard it as a key value, which completely different from being mere biological material, or from the vegetable or animal world.

The embryo, it is stated, must be surrounded by a duty of respect, as it can be recognised as a subject, in consideration of his human nature (intended in the biological, not ontological sense), and cannot be reduced to mere object.

Recognising the subjectivity of the human embryo means guaranteeing the conditions that in the first instance promote his development and birth and protect him from sacrifices unjustified by scientific interests that are of no clear usefulness, are risky and have an uncertain outcome.

The principle of human dignity allow us to argue the position against the production of man-animal interspecies living beings, even starting from a position of doubt or *tout court* negative about the subjectivity of the human embryo. This principle operates, in fact, in extreme cases like this one, also in defence of the image or concept of the human being as a universal category. Moreover, even if we don't believe in completely protecting the human embryo, but we admit that he has qualities different from the simple animal biological material, it is still possible to distinguish between various ways of use, according to different degrees, intensity and implications. From this point of view, we can well recognise that the creation of human-animal interspecies beings, bringing into question the uniqueness of man and his dignity in comparison to animals, is different from any type of research, destructive to

⁵⁸ Cf., amongst others, also L. Eisenberg, *The Human nature of the human nature*, “Science”, 1972, 176, pp. 123-128.

⁵⁹ Cf. also S. Pines, *Guide for the perplexed: moshe Maimonides*, Chapter 41, Chicago Univ. Press, 1898.

⁶⁰ Cf. also D. Loike, M.D. Tendler, *Revisiting the definition of homo sapiens*, “Kennedy Inst. Of Ethics J.”, 2002, 12/4, pp. 343-350.

single individuals or not, which however does not bring into question the uniqueness of man. Damaging the principle that distinguishes man and animal has repercussions on the principle of equality that presumes a conception of the human being as a universal category with which each individual can identify.

The idea of being able to remedy this violation of human dignity, prohibiting the transferral into a maternal uterus and imposing in any case the suppression of cybrids on the 14th day in order to avoid their development, confirms – as said above – the violation. Or, in fact, the creation of the cybrid does not damage human dignity, and therefore why arbitrarily establish a legal limit for its development? Or it does damage it, and in that case it is not the duration (14 days) and the prohibition of transferral in the maternal uterus to constitute a cause of justification. On the other hand, it is very difficult to reconcile this practice with the Regulations of the Oviedo Convention – which protect the human being in his dignity and identity (art. 1) - , and in particular in Articles 18.1 and 18.2. In fact the first establishes that “where the law allows research on embryos, it shall ensure adequate protection of the embryo”, whilst the second forbids “the creation of embryos for research purposes”.

The European Court of Human Rights recognises the human dignity of the conceived, however, it does not give an opinion on his subjectivity, because of his development potential. It is difficult to isolate, almost conceptually freezing, the beginning of human life – which in Italy is explicitly protected also by the L. number 194 of 1978 – cancelling his development potential. Forbidding the cybrid’s development does not therefore mean cancelling the violation of human dignity, which has already happened with the creation of the cybrid for research purposes, but desperately attempting to confine it, leaving open, in this way, a dangerous opportunity for the creation of human-animal interspecies beings, in contrast to that principle of egalitarian universalism on which all post-second world war constitutional democracies are founded⁶¹.

It can be useful to observe at this point that a greater awareness of the unacceptability of such research is found in the law, like the German one, constitutionally inspired to the principle of human dignity, where even those who criticize the overload of human dignity, distance themselves from the possibility of creating human-animal interspecies beings⁶². Italy has a

⁶¹ J. Habermas, *The Future of Human Nature. The Risks of Liberal Genetics*, English translation by Hella Beister and William Rehg, Polity Press, Cambridge 2003.

⁶² Interesting, from a legal or ethical-legal point of view, the debate on human dignity that has developed in the last decade in Germany, after the coming into effect (on the 1st of January 1991) of the law on the protection of embryos (Gesetz zum Schutz von Embryonen) with particular reference to the authors who raised the problem of the überforderte Menschewürde (overloaded human dignity) in a controversy against an excessive reference to art. 1 of the German constitution (human dignity’s “intangibility”) in the issues regarding the embryo (U. Neumann, *Die Tyrannei Würde*, ARSP 1998, 153 s.; B. Schlink, *Die überforderte Menschewürde*, in *Vergewisserungen*, Zürich 2005; *Biowissenschaften und Biotechnologie - Perspektiven, Dilemmata und Grenzen einer notwendigen rechtlichen Regelung*, JZ, 2008; P. Bahr - H.M. Heinig, *Menschewürde in der saekularen Verfassungsordnung*, Tuebingen 2006). It is significant, in this regard, the opinion that the authors against the overload of human dignity express about the appropriateness of referring to this principle in the case of the creation of man-animal mixed beings. In fact, although they invite us to differentiate the assessment of the different issues without suffocating them – as they say – under the constant reference to the human dignity principle, they cite the eventual creation of man-animal mixed beings as an example of the certain violation of the human dignity principle (U. Neumann, *Die Tyrannei der Würde*, ARSP 1998, 162; B. Schlink, *Die überforderte Menschewürde*, in *Vergewisserungen*, Zürich 2005, 136). And one author stresses, on this point, that in this case the human dignity

Constitution that, like the German one, is inspired to the human dignity principle and therefore we believe, as a NBC that must inspire its opinions to this principle, that we need to take it into account. With this, we don't want to "judge" the experience of other countries, but only to show how from certain constitutional premises, certain evaluations can be drawn, which instead in other Countries' Regulations – where the human dignity principle is not recalled with the same insistence – are not accepted. On the other hand, because the European Court of human rights also accepts the reference to the principle of the protection of human dignity in general with regards to the conceived (cf. sentence *Vo contro Francia* 8th of July 2004) the perspective followed here can also be considered the one more in harmony with the principle of the European law in the formal sense.

The issue also lends itself to being considered from the more general point of view of the relationship between law (constitutionally oriented) and technology.

The prohibition of creating mixtures between human gametes and animal eggs, contained in the Italian and German law, beyond any consideration in the matter, can be said to be the expression of a formal principle of guarantee against the claim of technocratic irresponsibility. Limiting to the will of power of those working in the technology field, means in essence preserving the minimal conditions of democratic balance, which presume that the law will not change "from regulating to regulated with regards to the technical capabilities of realising aims without excluding any"⁶³. To do this in an extreme case (*Extremfall*), as with regards to the creation of human-animal interspecies beings, certainly does not change the freedom of research, but it is useful in questioning researchers as socially responsible subjects⁶⁴.

2. The second ethical reason regarding the illegitimacy of the abovementioned experimentations moves from the possibility (which cannot be in effect excluded) that scientific research – although initially focusing on the destruction of such entities – could "slip" into the temptation of transferring them into the uterus to verify their possible survival. What must be stressed is the ethical importance of the protection of a balanced relationship between living beings, which is an essential condition in maintaining the ecosystem, and the "responsibility" when facing the risks of such experiments and when considering their effects on subject who cannot express their consent, like future generations⁶⁵. The uncertain consequences, in the short and long term, of an interspecies mixture, for society and future generations, should persuade scientists to have a coherent attitude of cautious interruption of any form of this kind of experimentation. This is one of the cases in which it seems our duty to employ the *precaution principle* as guideline, quoted by many in bioethical reflection (on which the NBC already drew up – in 2004 – a specific document titled *Precaution principle: bioethical, philosophical and legal profiles*), a principle that opens up to a tutioristic and responsible attitude.

principle is legitimately invoked even in defence of a conception of man, and not only in defence of a single man against his eventual exploitation. It is – Neumann states – an unacceptable violation of the image of man (*Menschenbild*), according to a unanimous point of view.

⁶³ E. Severino in: N. Irti – E. Severino, *Dialogo su diritto e tecnica*, Bari-Roma, 2001.

⁶⁴ These reasons are shared also by Stefano Canestrari and Lorenzo d'Avack, who base their agreement with the first three points of the opinion's conclusions on them.

⁶⁵ H.Jonas, *Das Prinzip Verantwortung* (1979).

3. The third ethical reason of illegitimacy refers to a possible instinctive feeling of “repugnance” towards experimentations which endanger the identity of the human species. This is an argument that goes “beyond reason”, as it is not rationally articulated and it is based on an immediate reaction, on emotions and feelings, but is not for this devoid of wisdom, good sense and ethical value (think about the repulsion we feel towards incest or cannibalism)⁶⁶. The repugnance does not come from the strangeness or novelty of such experimentation, but from the intuition of rejecting the excesses of human will, which can violate (in this case) the specificity and separateness of the human. In addition, the reproductive connection that characterises living species distinguishing them from any other cataloguing form, has for the human species a peculiar meaning of “relations”⁶⁷, becoming a place of mutual recognition. This recognition of the *humanum* in itself and in others does not mean a discrimination of other living species as inferior – speciesism – but awareness of belonging to our species. It is within the species that the normative understanding of self, as beings of a type is realised, and this allows us to respect each other as free human beings, equal in dignity. The prospect of interspecies reproduction makes the recognition confused and uncertain, endangering the possibility of thinking about our identity as human beings. These arguments must be taken into account when establishing to what extent the genetic “manipulation” of the gametes, the application of techniques allowing cross-fertilisation with other animal species, or in any case man/animal hybridising practices, can alter the “notion” of human species itself and its “representation” at the common level.

Some NBC members⁶⁸ disagree with the previous bioethical evaluations on the basis of some observations expressed during the debate and that they intend to synthesise as follows.

I. General observations.

Despite the title *Chimeras and Hybrids*, the document tackles almost exclusively the ethical problems raised by cytoplasmic hybrid embryos (cybrids), obtained through the technique of transferring the nucleus of a somatic human cell into a denucleated animal egg cell, in which animal mitochondria are still present. This technology has been the object of ample debate in Great Britain, following the request of authorisation to carry out such an experiment, advanced by some researchers of the *Human Fertilisation and Embryology Authority* (HFEA). The experiment has limited scope and has two aims:

a) studying in more depth the biochemical processes through which the nucleus of the somatic cell is reprogrammed by the egg cell, with the purpose

⁶⁶ The argument of “repugnance” is also taken into consideration in the document of the Danish Bioethics Committee “Man or mouse? Ethical aspects of chimera research” (2008), cf. in particular pp. 42-44 and pp. 54-57. In this document it is believed that such feeling could have a biological value (as a mechanism inherited during the evolution process, in order to protect our species) or an anthropological-cultural and symbolic value (as social taboo, the taboo of interspecies mixture). These are interpretations which attribute to the repugnance feeling the function of preserving our species, in the strong sense (as it is considered unchangeable by culture) or weak (if changeable).

⁶⁷ R. Spaemann, *Personen* (1996).

⁶⁸ C. Flamigni, S. Garattini, D. Neri, A. Piazza, M. Toraldo di Francia, G. Zuffa.

of identifying the biochemical determinants of the reprogramming process so that it can be reproduced in vitro, without having to use egg cells anymore (in the experiment in question, they intend to use animal cells because of the insufficient availability of human egg cells);

b) attempting to acquire embryonic stem cells to compare with those obtained by human embryos formed in vitro for research purposes.

With regards to this second objective (which, in the current state of the art, cannot be achieved for sure), we want to stress that, in any case, embryonic stem cells so obtained can be research instruments to investigate specific biological issues, but can never have a clinical use because of their contamination with animal biological material. The regulations regarding the safety of any biological product used in the human field are contained in the EC Regulation No.1394/2007 of the European Parliament and of the Advanced Therapies Council.

In giving the authorisation, the HFEA felt that the projects – despite the presence of animal mitochondria – involved “living human embryos” and therefore subjected the projects to the same strict obligations that are in force with regards to the authorisations to produce human embryos for research. In particular: a) the embryos obtained in this manner cannot be transferred to a woman’s uterus; b) must be destroyed by the 14th day. Clearly, the experiment stays confined to the laboratory, it must finish within a fixed term and categorically excludes (according to English law this would be a crime) the transferral of the product of the experimentation in a uterus.

At the moment we don’t know if this experiment will be carried out, but in any case it is part of a wider international debate on the problems arising from interspecies organisms and, therefore, on the so-called “overcoming of the species barriers”, and, more in general, on the perspectives of scientific research in the field of stem cells and of their possible therapeutic applications. Because of the arguments’ novelty, rather than giving normative instructions, it would be appropriate, according to the abovementioned members, to begin a more in depth study of the whole field of research, in order to clarify the ethical and scientific implications for public opinion: in other words, to open, without any preconditioned moral condemnation, the debate on the wide scope of ethical, philosophical-anthropological and scientific issues raised by these recent developments in research and technology.

But, even wanting to focus the attention, for exemplification purposes, on the experiment of cytoplasmic hybrids, it is necessary, to evaluate the moral meaning of these new entities’ experimental creation, to discuss at least two points: a) the possibility of a “biological” definition of the human embryo; b) The definition of “beginning of personal human life”. It is also true that the NBC has already presented an opinion on these issues, in 1995 (Identity and Status of the Human Embryo), but we don’t see why we shouldn’t, given the opportunity in this new document, return to this topic – as already proposed by those who subscribe to these observations – focusing our attention on the interesting debate taking place internationally, with regards to the possibility of agreeing on a biological definition of human embryo⁶⁹.

The current definition of human embryo, in effect, generally includes all the biological entities created following the fertilisation of a human oocyte by a human spermatozoon. Recently however, it has been possible to create similar

⁶⁹ Cf. J.K.Findlay, *Human embryo: a biological definition*, “Human Reproduction”, 2007, 22, p. 905.

entities, to which in principle we have to assign the definition of embryos, in other ways, like the introduction of parthenogenesis and the transferral of the nucleus of somatic cells (SCNT) in human oocytes and, as we mention in this document, also animal; in the case of the transferral, also the possibility of “silencing” some genes in order to make any development biologically impossible (we refer to the so-called *Altered nuclear transfer* proposed by W. Hurlbut and discussed by the President’s Council on Bioethics⁷⁰). For this reason many biologists have raised the question of whether it is appropriate to “rethink” the biological definition of “human embryo”.

In the light of the various emerging technologies and taking into account the development potential and the genetic make-up of the products so obtained, the abovementioned article by Findlay, proceeds to analyse these possibilities (some, at the moment, only theoretical) to illustrate how biotechnologies can produce “living” structures that cannot be implanted or that cannot allow the birth of beings able to live and can lack the genetic contribution of one of the two gametes or, finally, can contain the DNA of two different species.

Findlay’s conclusions can be summarised as follows:

- 1) in order to be defined as “human embryo”, a biological entity must be potentially able to form a living being;
- 2) It is not instead indispensable, for this purpose, that the biological entity is formed following a fertilisation process and a singamic mechanism;
- 3) The biological definition of human embryo should not exclude, in particular, entities formed with the DNA of two different species;
- 4) It is necessary to question whether the definition of human embryo must refer to a specific point in time during the development. In the biology of development the definition of human embryo generally includes the reference to a certain moment in the development, but in the context of the potential capability of continuous development. In this sense, the term human embryo cannot be applied before the singamy, that is, the completion of the fertilisation, the moment in which the genome of the new individual is formed starting with his/her parents’ genomes.

A definition of human embryo based on singamy, however, excludes reproductive biotechnologies that don’t make provisions for the fertilisation of a human oocyte by a human spermatozoon. Some of these technologies are theoretically capable of leading the creation of living human beings, others aren’t. It could therefore be more appropriate to evaluate the potential ability that these entities have of developing up to the appearance of the primitive embryonic line or of going beyond its appearance.

Therefore the definition of human embryo should be separated in two components: the first, relative to the development processes resulting from the fertilisation of a human oocyte by a human spermatozoon, and the second relative to what can derive from other processes.

At this point, Findlay proposes the following definition of embryo: a human embryo is a distinct unity who can originate from:

- a) the first mitotic division, at the moment in which the fertilisation of a human oocyte by a human sperm is complete;

⁷⁰ Cf. President’s Council on Bioethics, *Alternative sources of human pluripotent stem cells*, Washington, D.C., 2005, pp. 36-49.

b) any other process that starts the organised development of a biological entity with a human nuclear genome, or a modified human nuclear genome, who have the potential capability of developing at least to the stage in which the primitive streak appears.

This definition tries to take into account the categories that represent the various stages of development, the structure's potential capabilities and the origin of the DNA, which contributes to the formation of the new individual. Findlay admits that there can be confused and anomalous situations, like the possibility of defining as embryo an entity who has formed by natural fertilisation and then lacks the potential capability of continuing in his development, whilst a similar entity artificially created might not deserve this definition. On the other hand, Findlay observes, there's no doubt that the definition of embryo must be given by rights to a human oocyte fertilised by a human sperm, regardless of his potential development capabilities.

On this considerations is based the second argument, relative to the definition of "beginning of personal human life", which seems indispensable for the purpose of establishing whether personal dignity can or cannot be recognised to the various entities to which we intend to attribute that definition. If, for example, we accept the definition of "beginning of personal life" presented by the supporters of relational personalism, which favours the implantation into the uterus as condition of relational subjectivity, the conclusions regarding the level of dignity to be recognised to cytoplasmic hybrids would be very different from those presented by the previous bioethical evaluations.

This hypothesis of a personal life that begins with the implantation of the embryo in the uterus is at the basis of a third form of personalism (the other two are those defined as functionalist personalism and substantialist personalism), which does not attribute to biology or to functional services the person's diriment character. This personalism, defined as "relational", links the dignity of life to the context of relations of which it's part and to the project of life it expresses. At the end of its nesting within the uterus (14th day) the embryo establishes the cellular communications with the maternal organism and at the same time, within it, the beginning of the differentiation between embryonic component and extra-embryonic component takes place. From that moment the embryo is no longer a guest in the uterus, but he/she is intimately connected to the maternal tissues, a bond that is not only biological, but leads to an intense relationship of communication and from which starts a project of life based on that relationship. In other words, the relationship with the mother is defined and the one with the outside world is clarified: the embryo becomes a *being-in-relation*. In this way his/her identity in the relationship becomes a significant element, which the embryo did not have before the nesting.

According to the supporters of this particular form of personalism, the relationships represent a summative and qualifying anthropological trait, where biology is, anthropologically, necessary but insufficient and the functions are important but not crucial. A further consequence is that the embryo cannot be considered apart from his/her project of life and context: the implantation into the uterus signals the passage from a phase in which the embryos don't have a configuration of relationship that is significantly human and can be used (for example in scientific research) with vigilance and caution, to a phase in which they have an established configuration of relationship and must therefore have a different kind of protection. Beyond the mere biological fact, the recognition of

the mother as a protagonist in the making of the new living being and of the relationship as an element that links biology and biography, make this passage a key anthropological threshold also from a theological point of view.

In conclusion, this connection of perspectives opens the way to the possibility of using the embryos, formed but not yet implanted, for scientific research purposes, but it does not intend to be an indiscriminate consent: if human life – because this is what we are talking about – must not become sacred, it also cannot be used at a whim, in the interest of scientific or economical powers.

II. Specific observations.

The general observations presented above are the background to some specific observations on particular points based on two orders of arguments.

The first refers to the evaluation of scientific research and of the reasons presented in defence of its practicability and concludes with the statement that “the studies on cytoplasmic hybrids at the moment are hardly justified”. But the mere fact that the scientific proposition is, at the moment, scarcely justifiable from the point of view of previous scientific evidence, does not imply its immorality, but, at most, its uselessness. The connection between scientific justification and morality of research is important in pharmacological and clinical trials on human beings (who would be subjected to a useless risk if the protocol was hardly scientific) and not in base research. We also want to stress that, in the case of the experiment in question, rather than talking about scarce scientific justification (in the previous bioethical evaluation at the end of paragraph 2, the protocol followed in creating hybrids is described as “sufficiently standardised”), we should talk about scarce evidence with regards to the possibility that this experiment will reach its objectives: but the mere circumstance that, in effect, an innovative proposition cannot demonstrate any scientific evidence that is already established, cannot be a reason to condemn such proposition. From the point of view of the internal criteria governing scientific research, it would be a contradiction to state that a proposition that is not yet referenced by evidence must not, only for this reason, be pursued: this would be the same as saying that no innovative research can ever be undertaken. In 1980 the Nobel Prize Mario Capecchi was refused funding for his research on homologous recombination by the NIH, as they were considered “unworthy of being pursued”. Capecchi did not allow this to discourage him and, some years later, granting him the funding, the NIH stated: “We are happy that you did not pay attention to our assessment”⁷¹.

To these evaluations about the scientific value of the research in previous bioethical assessments, we add a critique of the reasons given by researchers in defence of its practicability. In reality, these are ideas taken from the consultation promoted by the HFEA – that cannot directly be attributed to the researchers in question – in the course of which some have voiced the fear (see letter a) that, once this practice is made legitimate, we could give into the temptation of aiming to “liberalise other forms of interspecies fertilisation” and to “transfer such hybrid cellular populations into the human or into the animal body”: aims that in addition, if realised, would be a crime according to the current English legislation, as already recalled.

⁷¹ S. Simple, “Scientist Profile: Mario Capecchi, Ph.D.”, Genetic Science Learning Center, University of Utah: www.gslc.genetics.utah.edu/features/capecchi/.

As for the letter b), we observe that the fact of wanting to protect women is an ethically significant caution, to eventually balance against the possible risk for the cybrids, which we actually don't know exactly what it could be and that, in any case, would require a preliminary decision about what type of protection can be assigned to such entities.

Finally, with regards to the letter c, we observe that, should this research open therapeutic perspectives of recognised interest for human health, the eventual increase in the demand for human oocytes – with all the ethical problems that it undoubtedly involves – should be balanced against the importance of such therapeutic perspectives. When we use a consequential argumentative style, we must in fact be ready to examine the positive and negative consequences of the practices under discussion and to attempt to balance them.

The second order of arguments refers to more general ethical reasons, which can be summarised in three points: a) the protection of the dignity of the human embryo and of the integrity of the species; b) the precaution principle, in relation to the protection of the ecosystem and to the consequences for future generations; c) the feeling of repugnance.

With regards to the first point, the value of the argument depends on the answer to the question of whether the cytoplasmic hybrid is a human embryo or if the presence of mitochondrial DNA of animal origin makes it non-human. On this point, we want to recall that such entity is the product of cloning through the transferral of the nucleus of a human cell and that in the most usual definitions of cloning (cf. Law No.40 “Regulations on Medically Assisted Procreation”, art. 12, subsection 7; additional Protocol to the Convention on Human Rights and Biomedicine, art. 1, subsection 2) the nuclear genome is considered essential – for an ethical and legal qualification – not the mitochondrial one.

In any case the meaning of the following arguments about the damage to the “quality of the embryo's identity”, the “radical manipulation of the human being” and finally the conclusion to this first point, rests on the attribution of the human character to the cybrid. However, in previous bioethical evaluations we simply state that such attribution “has not yet found a shared response”, preferring to fall back on the “uncertainty of identity” that, from what we understand, does not depend on the mere combination of biological material, but on the impossibility of the “intuitive” recognition of the new living being as belonging to the human species. The lack of intuitive recognition – together with the instinctive “feeling of repugnance” (see later) through the overcoming of the so-called “barriers of species” – would be an uncertain proof of the cybrids' identity, which therefore would be a sort of “degraded human beings”: from this the charge of damaging human dignity, the species' identity and the meaning of human itself. The link between these statements and the experiment discussed in the whole document is very vague and, in any case, it takes for granted that the circumstances at the centre of the second point of these bioethical evaluations have been realised.

This second point is based on the intentions, attributed to not better identified researchers, aiming at liberalising other forms of interspecies fertilisation, transferring such hybrid cellular populations into the human or into the animal body to verify their possible survival. On this basis, we can imagine a situation in which such entities would be released in the natural and social environment, putting at risk the balanced relationships between living beings and affecting future generations, which would suffer, without being able to

express their consent, an “interspecies mixture”, also because of the possibility of an “interspecies reproduction”, discussed further on, which would threaten the opportunity of thinking about our identity of human beings. There is no way of expressing a logical evaluation of this situation; as stated in the previous bioethical assessments, the possibility of its occurrence “in fact cannot be excluded”, just like, in fact, nothing can be excluded about the future.

The third point refers to the “wisdom” of the instinctive feeling of repugnance towards experimentations which put in danger the identity of the human species itself. Naturally the entity of this danger is proportional to the plausibility of the situation described above, but the fundamental problem is to understand how much wisdom can be ascribed to the feeling of repugnance. In fact, one thing is to observe that something generates a feeling of disgust or repugnance (we could, at most, believe that this observation is a sort of warning signal), another thing is to state that on this feeling we can found a judgement of immorality about something or, even, to ask for it to be forbidden by law. We cannot in fact forget that, not long ago, that feeling was invoked – as the Danish Bioethics Committee, referred to in the note, recalls – to condemn as immoral homosexuality; and the examples could multiply to show how not always, in past history, that feeling expressed wisdom and good sense, but immoral prejudice instead. In any case, not accepting the recourse to the feeling of repugnance without any criteria of distinction (if not that of the mere passage of time), calling upon it today to condemn this or that practice is only an expression of the personal preferences of those who appeal to it: its content of wisdom or prejudice can only be evaluated by future history.

Synthesis and conclusions

Following the previous considerations, some NBC members⁷² arrived to the conclusions synthetically reported here.

- The mixture of human/animal tissues and/or cells and/or genes can raise bioethical problems emerging in particular when the created organisms have an uncertain identity, as they lead to overcoming the barriers between the human species and animal species; this problem presents itself for some types of chimeras and transgenic organisms *and for all hybrids*, in the case of mixtures between the human and non-human species.

- Every scientific experiment that alters the identity of the human being and of the human species is not ethically acceptable, even if carried out in the name of the increase in knowledge that we can derive from it.

- The same NBC members, for the reasons discussed in this document, hope for the suspension of the creation of man-animal hybrids and, only if adequately justified, the use of alternative research techniques, as for example the hybridising between different animal species, which still requires a careful and adequate bioethical evaluation.

⁷² S. Amato, A. Bompiani, S. Canestrari, R. Colombo, A. Da Re, F. D’Agostino, L. d’Avack, B. Dallapiccola, M.L. Di Pietro, M. Gensabella, A. Isidori, A. Morresi, A. Nicolussi, L. Palazzani, V. Possenti, R. Proietti, L. Scaraffia.

Other NBC members⁷³ instead have reached the following conclusions:

There is no doubt that the problems discussed in the Document – overcoming of the barriers between species, creation of new entities mixing human and animal genetic material in a laboratory – have an enormous relevance and call for great caution in the evaluation and control of these new powers of intervention. However, for those who don't accept the "slippery slope" argument (especially in the catastrophist form described above), because they believe that the responsibility principle requires, today more than ever, the recognition of differences, which change things, and do not agree with the ethical thesis of the absolute protection due to the human embryo in the very first stages of development (even when founded on the topic of the uncertainty of identity), the condemnation of the creation of cybrids cannot be shared. We believe, in fact, that the empirical observation that cybrids are not destined to develop makes a difference and that a transparent and rigorous control of this type of experiments – if conducted for cognitive purposes and if they can be reproduced in different laboratories – is, even from the bioethical point of view, more acceptable than their a priori condemnation founded on an excessively strict application of the precaution principle.

⁷³ C. Flamigni, S. Garattini, D. Neri, A. Piazza, M. Toraldo di Francia, G. Zuffa.

APPENDIX

Legal discipline

1) The legislation in some countries.

Italian legislation precludes, as well as “interventions of cloning through nucleus transferral”, all forms of creation of chimeras and hybrids, punishing with a sanction of up to more than 6 years “the fertilisation of a human gamete with a gamete of a different species and the creation of hybrids or chimeras” (art. 13, subsection 3, c-d of Law No. 40/2004 “with regards to medically assisted procreation”). It’s not completely clear, however, to which of the two crime hypotheses we must assign the creation of cybrids, which is this document’s topic: the cybrid, in fact, is not created from the fertilisation of a human gamete with a gamete of a different species (letter d), but from the transferral of the nucleus of a human adult cell (letter c), into a denucleated animal oocyte.

We can get other ideas – still not always clear with regards to their legal qualification as hybrids or chimeras – from other countries’ legislations concerning the research on embryos, which, in general, move between two extremes: on the one hand, more liberal legislations (for example, some Asian countries like China, Singapore and South Korea); on the other, the rigid ban on using embryos in research (for example some European countries like Austria, Germany, Italy, Poland, Lithuania, Norway, Slovakia)⁷⁴. In between there are countries (for example India, South Africa, Israel, England) that allow the experimentation on embryos (the first two also the nuclear transferral or therapeutic cloning) under the control of specific *Authorities*. A variety of European countries follow a middle way, using only residual embryos below the 14th day of development (Spain, Sweden, Denmark, Finland). Only Germany (*Embryonenschutzgesetz* of the 13th of December 1990) limits the use to the 21st hour from conception. The French parliament, with a measure put in place on the 22nd of January 2002, banned cloning for therapeutic purposes, authorising research on surplus embryos deriving from assisted fertilisation. The Belgian law of the 11th of May 2003 limits research to surplus embryos, but allows cloning (nuclear transferral), when the research objectives require it. Nuclear transferral is, currently, accepted also in Sweden and Finland.

In Australia it is allowed to create embryos for research through SCNT, but it is forbidden to produce hybrids, except than for testing the quality of the sperm⁷⁵. The *Canadian Assisted Human Reproduction (2004)* explicitly forbids the creation of human/animal hybrids and chimeras and their transferral in human or non-human beings. The creation of hybrids for reproductive purposes is also explicitly forbidden. The *USA Draft Human Chimera Prohibition Act (2005)* forbids the creation of human chimeras, the transferral of human embryos in a non-human uterus, and that of a non-human embryo in a human uterus; some types of man/animal hybrids could be defined as chimeras⁷⁶. We must take into account that, in federal legislation, individual American States

⁷⁴ M. Fusco, *Embrioni clonati: sì da Londra. Una “fuga in avanti” nella sperimentazione terapeutica* in “Diritto e giustizia”, 2004-32, p. 8 ff.

⁷⁵ This is the hamster test, in which a human spermatozoon and a hamster oocyte are fused, with the aim of testing the sperm’s vitality. Usually what is created, is a zygote that blocks its own development after reaching the bi-cellular stage.

⁷⁶ HFEA document.

present a differentiated panorama. Even here, there are States with a more liberal legislation (for example California, Connecticut, Illinois, Maryland, Massachusetts, New Jersey, Missouri, Rhode Island) and others with much more restrictive regulations (for example Florida, Louisiana, Maine, Michigan, Minnesota, North and South Dakota, Pennsylvania).

In Great Britain the revision of the *Human Fertilisation and Embryology Act* (1990) which banned the mixing of human gametes and animal gametes, apart from the concession of explicit authorisations, was extremely complex. The “White book”, issued by the English Government in 2006, stressed the opportunity of keeping the prohibition of creating chimeras and hybrids in vitro, foreseeing the possibility of allowing exceptions. Subsequently, the *House of Commons Technology Committee* reached the conclusion that the creation of chimeras and hybrids is necessary for research, but lacks an adequate legislative definition of the threshold that divides the human from the non-human. In 2007 the Department of Hill issued a detail proposal of revision through the *Human Tissue and Embryo (Draft) Bill*⁷⁷. In 2008 the *Human Fertilisation and Embryology Act* was amply revised with regards to the problem of chimeras and hybrids, adopting in point 4, relative to *Prohibitions in connection with genetic material not of human origin*, the expression “human admixed embryo”, to which an extremely analytical and detailed series of hypotheses is linked⁷⁸. It is prohibited to implant into a woman’s body all these heterogeneous forms of “human admixed embryos”, any other non-human embryo, any gamete that is not a human gamete. Nobody can mix human gametes and animal gametes, causing the creation of, preserving and using “human admixed embryos”, except when having proper authorisation. It is not possible to authorise keeping or using “human admixed embryos” after the appearance of the primitive streak or after the 14th day from the beginning of the creation process. Even the implantation in an animal cannot be authorised. At the moment of discussing the document, the HFEA (*Human Fertilisation*

⁷⁷ In particular art. 17.2 prohibits the implantation of interspecies embryos in a woman’s or in an animal’s body, describing in detail the various hypothesis: a) embryos created using human and animal gametes; b) embryos created cloning the nucleus of an animal oocyte or a cell derived from an animal embryo with a human cell or the nucleus of a human cell; c) a human embryo altered by the introduction of an animal nuclear or mitochondrial DNA sequence. The authorisation to research cannot allow the preservation or use of an interspecies embryo a) beyond the appearance of the primitive streak; b) beyond the end of the period of 14 days starting from the beginning of the creation process of the interspecies embryo; c) when half of the time of gestation or incubation has passed in which the nuclear or mitochondrial DNA is contained within the embryo.

⁷⁸ (a) an embryo created by replacing the nucleus of an animal egg or of an animal cell, or two animal pronuclei, with—
(i) two human pronuclei,
(ii) one nucleus of a human gamete or of any other human cell, or
(iii) one human gamete or other human cell,
(b) any other embryo created by using —
(i) human gametes and animal gametes, or
(ii) one human pronucleus and one animal pronucleus,
(c) a human embryo that has been altered by the introduction of any sequence of nuclear or mitochondrial DNA of an animal into one or more cells of the embryo,
(d) a human embryo that has been altered by the introduction of one or more animal cells, or
(e) any embryo not falling within paragraphs (a) to (d) which contains both nuclear or mitochondrial DNA of a human and nuclear or mitochondrial DNA of an animal (“animal DNA”) but in which the animal DNA is not predominant.

Embryology Authority)⁷⁹ has given three licences as many research groups for the creation of cytoplasmic hybrid embryos, with the condition that they are not transferred to the maternal uterus; that they are destroyed on the 14th day; that research leads to an advancement in knowledge⁸⁰.

2) Aspects of international and European law.

In international and European law we don't find any explicit normative indication in relation to our topic, but a variety of arrangements, regarding aspects relative to the modalities of the reproductive process (legitimacy of cloning), as well as the outcome of this process (patentability of the process or the product), that are linked to each other in a variety of ways by the reference to general clauses of respect of public order (*ordre public and morality*), of human dignity and of decrease in animal suffering⁸¹. These express, although in a general way and, as we will see, not easily applicable within the international and European context, the need to leave, in the application of the law, a flexible space, open to scientific development but also to the public perception of the scientific message, to economic pressures, and also to different sensitivities.

In this context, the creation of chimeras and hybrids forces, therefore, a reconstruction of the general lines of legal qualification of the human genome and, within it, the analysis of two specific problems: the legitimacy of the different forms of cloning; the patentability of biotechnical inventions achieved through cloning, including the cloning process itself. In this last case, we would not have a directly repressive intervention, but any possibility of economic incentive would be indirectly affected.

The legal, as well as ethical, relevance of the human genetic make-up is clearly expressed in art.1 of the *Universal Declaration on the Human Genome and Human Rights* (Unesco 11th of November, 1997) when it states that "the human genome underlies the fundamental unity of all the members of the human family, as well as the recognition of their inherent dignity and diversity. In a symbolic sense, it is the heritage of humanity". In stressing the profound connection between genetic identity and personal identity, the Declaration forces us to respect the "uniqueness and diversity of each individual" (art. 2) and gives very precise limits to research, and to its applications, which can "prevail over respect for the human rights, fundamental freedoms and human dignity of individuals or, where applicable, of groups of people" (art. 10). The collection of values indicated by the Declaration on the genome (dignity, identity, human integrity and the prevalence of human rights on the interests of society and science) characterises also the *Convention on Human Rights and*

⁷⁹ HFEA, *Hybrids and Chimeras. A consultation on the ethical and social implications of creating human/animal embryos in research*, April 2007.

⁸⁰ The documentation on the projects and licences can be consulted on <http://www.hfea.gov.uk/en/1640.html> with regards to those given by the University of Newcastle Upon Tyne and by the King's College London, and on <http://www.hfea.gov.uk/en/1698.html> with regards to those given by the University of Warwick.

⁸¹ The document does not discuss the problems of animal suffering linked to the creation of chimeras and hybrids, reserving the right of tackling this topic in the context of the Document in the course of the elaboration on "Methodologies alternative to animal experimentation". Here will suffice to recall the European convention for the Protection of the Pet Animals (ETS No. 125), which in art.3 (*Basic principles of animal welfare*) states that:

1 *Nobody shall cause a pet animal unnecessary pain, suffering or distress.*

2 *Nobody shall abandon a pet animal.*

Biomedicine, issued in Oviedo on the 4th of April 1997 that, in art. 1 number 1 of the additional protocol explicitly tackles, as we will see, the problem of cloning.

In the light of these dispositions two crucial problems remain open: if the recourse to cloning is possible in order to create chimeras and hybrids, and if, in any case, such activity is in contrast with the respect for human dignity and, therefore, with “*public order and morality*”. With regards to cloning we must stress a subtle linguistic divergence between the Declaration on the genome and the Oviedo Convention. Art. 10 of the Declaration forbids “reproductive cloning”, whilst art. 1 of the Convention’s additional Protocol uses a much more generic expression: “*Est interdite toute intervention ayant pour but de créer un être humain génétiquement identique à un autre être humain vivant ou mort*”. Point 2 of the same Article clarifies that the expression genetically identical human being means “*un être humain ayant en commun avec un autre l’ensemble des gènes nucléaires*”. Can we deduce a general ban, which includes both therapeutic and reproductive cloning? In doubt, Holland, at the moment of signing the Protocol, deposited a declaration in which it stated that the term “human being” refers exclusively to the already born and, therefore, it does not include the phases preceding his/her development. Even without discussing the controversy about the various forms of cloning and about embryos’ legal status, the Oviedo Convention contains a regulation that is absent from the Unesco text, art. 18 number 2 forbids “the creation of human embryos for research purposes”.

We would therefore have a variety of hypotheses:

- hybridizing experiments are in contrast with the ban on any form of cloning (modelled on Italian law and maybe on the Oviedo Convention), even if carried out on animal oocytes;
- independently from the legitimacy of cloning, hybridisations violate the ban on creating human embryos for only experimental purposes (art. 18 Oviedo Convention);
- Although therapeutic cloning is legitimate, hybridisations are, in any case, in contrast with human beings’ dignity and uniqueness.

In the last two cases, emerges the problem of the legal qualification of interspecies chimeras and hybrids. They are:

- human embryos, included in the provisions of art. 18 of the Oviedo Convention;
- human genetic material, included in the protection of every human being’s dignity and uniqueness
- biological material excluded from any specific form of protection.

We must take into account that these are “entities” obtained without fertilisation, but in many cases through the reprogramming of adult cells for cloning. Scientists themselves present the nature of their research in a different way stressing, in some hypotheses, the importance of knowing the interaction mechanisms between human and animal cells⁸² and, in others, the relevance of the study on the possibilities of reprogramming adult cells⁸³.

⁸² Like in the experiments carried out by the team lead by Hui Zhen Sheng of Shanghai’s Second Medical University, in which cells of men and women between 5 and 60 years old were transferred into New Zealand rabbit oocytes, developing numerous embryos containing human and rabbit genomes, see ref. [12].

⁸³ As in the case of the research on cytoplasmic hybrids authorised by the English HFEA in 2007.

Interpreters find themselves facing choices that have profound moral connotations, without having a stable and homogeneous cultural background from which to take inspiration.

For this reason, it is important that every national bioethics Committee fulfils its duty of clarifying the problems and making an effort to highlight the principles and values that should be the foundations of any legal resolutions. Jurists themselves stress the need for a moral integration of their work. The European Commission's Report on *Patenting DNA sequences (polynucleotides) and scope of protection in the European Union: an evaluation*, clearly highlights the need for a moment of ethical reflection: "*the aim of this background study is to give an overview of the various issues involved in the patentability of DNA sequences (polynucleotides) and the scope of protection of such patents. It does not deal with ethical issues, which were excluded from treatment in this study, as they require a different approach, which was outside the scope of the mission of the author and the Expert Group on Biotechnological Inventions*"⁸⁴. A similar invitation to reaffirm the centrality of ethics for the democratic legitimacy of the process of integration between different European countries, comes from the report of the working Group instituted by the European Commission on *Science and Governance*⁸⁵. Therefore it is necessary not only to identify the individual regulations related to the creation of chimeras and hybrids, but especially to reorganize the problematic issues left open by the reference to morality in the general clauses. A motion towards this was presented by the European assembly: "Embryonic, foetal and post-natal Animal-Human Mixtures"⁸⁶, but it has never been questioned. In the draft of the document we read: "The assembly invites the governments of member States to start a wide consultation and reflection with regards to the complex ethical questions due to the creation of animal/human mixed living beings". The aim is to elaborate an additional protocol for the *Convention on Human Rights and Biomedicine*.

3) *Public order* and morality in patenting law.

An important contribution to the models of legal qualification can be gained by the discipline on biotechnological inventions. The 1998 Directive of the European Parliament and of the European Council number 44⁸⁷, in Article 6 subsection 1, excludes the patentability of inventions whose economic exploitation is contrary to public order and morality, however it clarifies that "exploitation shall not be deemed to be so contrary merely because it is prohibited by law or regulation". This clause – already present in many national laws – has always generated many doubts in patenting law's scholars, both

⁸⁴ *Background study for the European Commission within the framework of the Expert Group on Biotechnological Inventions*, edited by Sven J. R. Bostyn, Directorate-General for Research Food Quality and Safety, 2004 EUR 21122, p. 1.

⁸⁵ *Science and Governance. European Society Taken Seriously*.

⁸⁶ Doc. 10716, 11.10.2005 (Mr Wodarg et al.).

⁸⁷ The Directive has been put into force in Italy by Law No.2006/78, which has made more defined and explicit what was more unclear and confusing in the Directive, with regards to the topic of exclusions from patentability. Art. 4 No. 1, in fact, in the general part of letter c) reproduces the Directive's generic formula, but in indicating the specific the preclusions contemplates "any proceeding of human cloning, whatever the technique used, the higher stage of development programmed by the cloned organism and the cloning purposes" (point 1), "any use of human embryos, including human embryonic stem cells lines" (point 3) and then it stresses, as a general norm in closing "it is, in any case, precluded from patentability any technical procedure using human embryonic cells" (No.2).

with regards to its practical applicability (no patent has even been refused on the basis of this clause), and with regards to its general meaning⁸⁸.

It must therefore be taken into account that the concept of *public order and morality* implies a complete overhaul of the widespread feeling of the international community, a feeling that goes beyond the directives of a single country, as recalled by the *Guidelines on biotechnological inventions*, which suggest that “a fair test to apply is to consider whether it is probable that the public in general would regard the invention as so abhorrent that the grant of patent rights would be inconceivable” (EU Dir. 98/44/EC.). A trend for the application of the “ethical clause” can be found in Article 6 second subsection, which exemplifies a non-exhaustive list of non-patentable inventions: “a) processes for cloning human beings; b) processes for modifying the germ line genetic identity of human beings; c) uses of human embryos for industrial or commercial purposes; d) processes for modifying the genetic identity of animals which are likely to cause them suffering without any substantial medical benefit to man or animal, and also animals resulting from such processes”. Also Article 27, paragraph 2, of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS 2) authorises individual countries to exclude the patentability of inventions that are in contrast with “*order public or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law*”.

Chimeras and hybrids are not openly mentioned, but “Consideration” number 38 of the EC Directive, clarifying the scope of Article 6, explicitly states that the list has a merely indicative character for the purpose of interpreting the reference to public order or morality and significantly adds that “whereas processes, the use of which offend against human dignity, such as processes to produce chimeras from germ cells or totipotent cells of humans and animals, are obviously also excluded from patentability”. This principle is stressed by the *Guidelines for Examination in the European Patent Office* (December 2007): “Also excluded from patentability under Art. 53(a) are processes to produce chimeras from germ cells or totipotent cells of humans and animals (EU Dir. 98/44/EC, rec. 38)”.

We could conclude that the creation of chimeras and hybrids is contrary, beyond the cloning techniques adopted and the embryo’s legal status, to the general clause of respect for *ordre public and morality*. However, in the interpretative processes, the boundary between biological sequences easily assimilated to any chemical reaction and human biological sequences which imply protection of dignity profiles, is still uncertain, as recalled in the Commission Report to the European Council and Parliament on the “Developments and implication of patenting laws in the biotechnology sector” (COM/2005-312). Generally, there’s no lack of interpretations that assimilate chimeras and hybrids, obtained with any genetic material, to mere “inter-species entity” biological artefacts or “Human/Non-human Interspecifics”. An Australian society, Amrad, in 1999 obtained a patent that covered the production of embryos containing human cells and cat, sheep, pig, bovine, goat or fish cells⁸⁹. Edinburgh university had originally obtained a patent (EP number

⁸⁸ D. Neri, *Etica e brevetti: il caso delle cellule staminali umane*, “Bioetica”, 2008, 2, pp. 203 ff.

⁸⁹ Subsequently, a provider of some of the base materials in the Chinese technological development was sold to an American society, Chimicon international. www.newsmax.com/archives/2003/8/153903.shtml

0 695 351) on the methods of isolation, increment and propagation of transgenic embryonic stem cells. Point 11 clarifies that the term animal cells must be intended in the wider sense “including human cells”⁹⁰. In 2005, the *US Patent and Trademark Office* instead reached the opposite conclusion, rejecting a similar request, because chimeras are too close to human beings to be patentable.

⁹⁰ V. Pignata, *Il contrastato brevetto rilasciato dall’U.B.E. inerente alle cellule staminali animali*, in “Il diritto industriale”, 2000-4, pp. 313 ff. The patent’s owner then modified the request, excluding the possibility of building human stem cells.

PERSONAL REMARKS

Supplementary personal remark signed by Prof. Assunta Morresi

This remark exists because of a pledge that was publicly although personally taken, as the coordinator of the NBC working group on the topic “Chimeras and hybrids”.

On the 15th and 16th of October 2007, the Luca Coscioni Association had the initiative of organising some public encounters in Rome, with the participation, as spokesman, of Stephen Minger – the English scientist leading one of the three research groups which obtained the HFEA’s (the English Authority on Fertilisation and Human Embryo Research) authorisation to experiment on cybrids – and Emily Jackson, HFEA official.

I participated to the meeting held on the 16th of October, directed mainly to Italian parliamentarians, and open to the public. The previous day a similar encounter had taken place at Rome’s University La Sapienza, in front of students, teachers and authoritative scholars. It would suffice to leaf through the newspapers published in those days, to see how the visit to Italy was preceded by a widespread media campaign in which this type of scientific research was presented as very promising; through interviews and statements, care possibilities for currently incurable, important diseases like Parkinson were offered. The refusal and the perplexity with regards to the opportunity, from an ethical and scientific point of view, of creating man/animal mixed embryos were often attributed to a conservative position, typical of those who refuse to face the new opportunity offered by scientific progress.

Another argument of the media campaign in favour of cybrids was the ways in which public debate was carried out in Great Britain: seeing the doubts and the controversy raised in the public opinion by this topic, the HFEA in fact promoted a citizens consultation, involving them in encounters, discussion days with experts, and producing informative material on it. A positive model of “participative democracy”, to imitate, according to our press.

Starting with this experiment, disallowed by the English law in force at the time, some generative commissions began a more in depth study in order to come up with a new bill on embryology, which would update the one currently in force, and would allow, amongst other things, the creation of interspecies embryos.

Having followed the international debate on this topic for a long time, and having examined the scientific literature and the documentation produced by English institutions, I feel that the research hypothesis was scarcely consistent, from a scientific point of view. I was also unconvinced by some passages in the procedures followed by the HFEA. I agreed and still agree with the idea of a public debate on the topic: but a debate that offers a real opportunity of scientific discussion, fully transparent.

During the encounter of the 16th of October 2007 in Rome, I therefore asked some questions to Stephen Minger and Emily Jackson, pledging to make the answers public – whatever they would be – attaching them to the NBC opinion on hybrids and chimeras, on which, in the meantime, I had started working.

The questions are printed at the end of this remark.

The answers arrive in writing after one year.

Stephen Minger wrote on the 14th of December 2008, directing us to read one of his scientific articles (S. Minger, *Interspecies SCNT derived human embryos- a new way forward for regenerative medicine*, "Regenerative Med.", 2007, 2, pp. 103-106), in which he explained his experiment's ratio.

Emily Jackson's answer, received on the 9th of January 2009, is printed at the end of this remark, after the questions.

In the document "Chimeras and hybrids" approved by the NBC we can find many of the scientific objections which are the object of the abovementioned questions.

The creation of cybrids for the aforesaid purposes, as it is presented, in the current state does not seem to have any chance of success. The objection often posed is that the purpose of any research is to answer unsolved problems, and to increase the level of knowledge. This aspect is more closely looked at in the attached document, and I would not repeat its arguments here. I simply observe that, as any researcher who has asked for funding at least once will know, every project has its ratio, and it is the researcher's task to prove its feasibility. If a line of research has been shown to be impossible to follow, if it has already failed, if it has presented some insurmountable or irresolvable problems, it is unfeasible to continue proposing it in the same terms.

All this – that is, the possibility of creating man/cow cybrids or not – should have been the object of debate within the scientific community, but superficial information has spread the idea that the experiment is valid and concretely feasible, influencing also the political debate, and directing the English one in particular towards the legalisation of such experiments.

According to the writer, Stephen Minger's and Emily Jackson's answers did not clarify the queries posed in the questions, but I believe that it is important to make the questions and answers known, in order to allow everyone a personal evaluation.

Questions to Stephen Minger:

1. You wish to produce cytoplasmic hybrid embryos. To do so, you intend to use a technique that at this point is widely considered ineffective and unhealthy for the animals created.

It is well known from the scientific literature that the rate of success of Somatic Cell Nuclear Transfer is 1-2% for the cloning of animals and zero for the cloning of humans. Ten years since the Dolly sheep cloning, this technique has failed to produce any human embryonic stem cell. The only thing SCNT actually produced is Korean veterinary Hwang Woo Suk's well known fraud.

The importance of mitochondria in the establishment of oocyte functional competence and early development was recently reviewed.

Many advanced the idea that SCNT's failure is due to incompatibility between mitochondrial and nuclear DNA among individuals belonging to the same species.

The cytoplasmic hybrid embryos you would produce would have both animal mitochondrial DNA and human nuclear DNA. That is to say, these embryos would inherit DNA from different species.

Only one published scientific paper reports a SCNT success in producing embryonic stem cells from hybrid embryos (Chen et al. Cell. Res. (2003)).

So far, neither the same research group nor any other one managed to successfully repeat that experiment. In the scientific literature we found out that many expressed doubts and criticisms towards that paper.

On the New Scientist issue of 15th September, in an interview with Robert Lanza of Advanced Cell Technology, we read: "his company has made many unsuccessful attempts to produce embryonic stem cells from animal-human hybrids". They grow to the 16-cell stage, then just before going on to become blastocysts, they block," he says. Lanza thinks this happens because the mitochondrial genome of the animal "stops talking" to the human genome, blocking further growth.

At this point, my question is: what is the scientific foundation of your experiment?

Perhaps it is the expectation to attain better results due to having an unlimited number of available oocytes?

If so, why is that the cloning of cows failed to yield any satisfactory result so far? Is your research project based upon any more solid scientific evidence?

From which argument you infer that success, that is to say to produce hybrid cytoplasmic embryos, is possible?

Given that the mixing of DNA coming from different individuals belonging to the same species failed, how can it be possible to successfully do the same with individuals from different species?

2. Your aim is to create "embryonic stem cell lines in order to determinate therapies for neurodegenerative illness".

Many neurodegenerative illnesses are due to altered mitochondrial metabolism. Given this, how can you use a model for neurodegenerative illness in which mitochondrial metabolism is altered since its initial formation, and it is altered for causes other than those inducing the illness?

3. In "Inter species embryos. A report by Academy of Medical Science", one reads: "In the context of cytoplasmic hybrid embryos, the mitochondria and the cytoplasm represent potential sources of retrovirus within the animal oocyte. [...]. The nuclear genomes of cows and rabbits do contain endogenous retroviral genomes. It is therefore possible that rabbit or bovine oocyte cytoplasm may contain RNA transcripts or express endogenous retroviruses encoded by their nuclear genome. Such viruses might conceivably re-integrate into the transferred human nucleus. While this scenario is not impossible, on balance we consider it to be highly unlikely. To ascertain whether such a genuine problem, expression profiles for endogenous retroviruses could be sought for oocytes from potential recipient species".

The authors specify that for these reasons, these cell lines should not be used for clinical treatment purposes. They also state that with standard laboratory procedures there shouldn't be any problem in this kind of research.

The same problem was noted in several others auditions - oral and written - of the Science and Technology Committee.

After the Creutzfeld-Jakob virus alarm, which originated in your country, I will be very surprised if Europeans institution will not ask for specific guarantees about these experiments. I'll be even more surprised if the ecological

associations, which were so openly critical at the time of the Creutzfeld-Jakob virus issue, will not express themselves.

How will your laboratories manage security issues for these experiments?
How do you intend to control animal oocytes?

Questions to Emily Jackson:

On certain conditions, Hfea can issue licences for human embryo research.

In your legal system, the definition of human embryo implies that its genome must be entirely human, and the embryo itself must be viable – it must have the potential to grow in the uterus.

Newcastle's Dr Armstrong declared that since the animal contribution to cytoplasmic hybrid embryos is small, it can be ignored, and the genome can be considered entirely human.

However, no geneticist treats genes in numeric terms. Genome has priorities, it has hierarchies, and as we know well, a very small flaw in one gene can cause a devastating disease, and generally have remarkable effects on an individual's development. Therefore the "numeric" argument is weak.

The second condition requires the embryo to be viable, which is able to grow once implanted into the uterus. With cytoplasmic hybrid embryos, the law forbids you from testing whether the embryo can grow there.

From parliamentary auditions, and from the observations that followed, we saw it's impossible to define how human and how animal a cytoplasmic hybrid is.

Therefore, we are not yet sure that Hfea holds the authority to issue such licences.

1. In January 2007 Hfea asked for a legal advice regarding the legitimacy of issuing licences for animal/human hybrids and whether cytoplasmic hybrid embryos are considered human for the purposes of the HFE Act.

HFEA obtained the legal advice they asked for, but they haven't made it public. They say that they are 'probably' allowed to release licences.

Why hasn't the legal advice made public?

2. I now refer to the pamphlet on line in the Hfea site, "Hybrids and Chimeras", which was published to inform people about the public consultation on interspecies embryos.

On page 5, as the pamphlet describes the importance of stem cell research, one reads "a number of team are carrying out research on stem cells - some derived from cloned embryos and some from embryos created through cloning". It seems that this is refers to human embryos. But we know that human embryonic stem cells obtained from cloned embryos either don't exist, or such results have never been published. Can you explain us the meaning of this phrase?

On page 7 the scientific background is described, and cell nuclear replacement technique is referred to as if it were an effective, currently practised procedure. We know that this is false. Such technique has not been successfully practised in humans, and this fact is not explained in the pamphlet.

Why? Perhaps you have information we ignore about cell nuclear replacement being successfully done in humans?

Answers from Emily Jackson:

The High Court this week decided that issuing licences for hybrid research is within our legal powers, and that the application for permission to judicially review whether or not we have that power was 'without merit'.

It is not true to say that in our legal system, 'the definition of human embryo implies that it must have the potential to grow in the uterus'. We exercise regulatory powers over all human embryos, including those that are genetically/chromosomally abnormal and hence unable to grow in the uterus.

The admixed embryo contains a full human nuclear genome, falls within the same genus of facts as an embryo created through normal fertilisation and is live. On that basis, and taking into account that parliament intended the regulatory scheme to be comprehensive, 'there was to be no free for all' (Quintavalle v HFEA, House of Lords, 2003), the HFEA decided that it could consider applications for research licences which satisfy the statutory requirements.

..*

Personal remark signed by Prof. Vittorio Possenti

The link between freedom of scientific research and bioethical issues is a fundamental and delicate problem: this personal remark discusses some considerations in relation to the document on chimeras, hybrids and cybrids.

I start from two of the document's phrases which mirror the first position: "The ethical value of the experimentations cannot be considered apart from its strictly scientific relevance: from this point of view, any research that is futile, highly and unnecessarily risky or undeservedly costly can be also ethically criticised." (p.15). In addition, we raise bioethical doubts about the studies on hybrids, believed to be "scarcely justifiable at the moment" (p.16). Within the NBC, there is a discrepancy in the evaluations of these points, between those who adopt an attitude of caution and prudence, and those who believe that the criteria of freedom of research and science are of primary importance. We pause on this issue, asking whether intrinsically unjustifiable research from a bioethical point of view exists, or whether the recourse to biotechnologies is without exception a categorical or unconditional imperative.

Supposing that we give a categorical imperative in favour of the recourse to technology, does this mean controlling nature? Researching useful effects? Lowering human suffering? That these purposes are not completely the same is clear when looking at the issues they tackle: that they are generally legitimate comes from the fact that they depend on specific inclinations present in man and rationally justifiable. Is there an unconditional obligation in them or in one of them? No matter how much we reflect on this complex problem, not one of the mentioned purposes has the character of an unconditional objective and therefore of a categorical imperative without exceptions: not even that of lowering human suffering and malum naturae – which is the most plausible -,

because its unlimited and therefore unconditional exercise would end up dealing with human dignity's fundamental aspects as subordinate means and instruments. This criterion represents a hindrance even for technology, in the sense that in its practice it is never legitimate to put in danger the person's essence, existence and dignity.

It is possible to foresee these conclusions observing the profound difference between knowing and acting. Knowledge is always good: there is no bad or forbidden knowledge. Different are things with regards to action, in which the division between good and bad prevails, so that there are good and legitimate actions, and bad and forbidden actions. Pure knowledge, scientific or of other nature, sought for in order to widen the scope of our knowledge, it is not only a profoundly human need and nobility, but it is something intrinsically good. To this pure knowledge it is applied, without restrictions, the axiom according to which there is no forbidden knowledge. But when knowledge brings in itself, in an indissoluble way, a technological action and its access into our life (human and non-human), knowledge's good without restriction is not unconditionally valid.

In effect, knowledge can be increased as much using immaterial and "poor" means, and in this way its increase has an unconditional value, as through the recourse to "heavy" and intrusive methods of acquisition. In this case the increase in knowledge can stop being a categorical imperative, and consequently the freedom of research can stop having unconditional value, even when its purpose is care and therapy. The method of acquisition of knowledge and its technological application to man cannot be beyond ethical guidelines and the limitations imposed by the need of respecting human dignity. The appeal to the scientist's responsibility, to his/her self-limiting ability, always important, is especially so in "technical sciences", that is, in those sciences that, unlike the strictly theoretical ones who simply know, know by changing, transforming, manipulating their object.

It is therefore not only the minimal level of methodological reference of the research on cybrids that advises us against putting it into practice, but the fact that there is not, at the moment, any evidence on the nature of the entity that would be created and on the eventual threat to human dignity. The criterion of freedom of research can and must be intrinsically limited by the principle of human dignity. In recent years the "heuristic of fear" (cf. H. Jonas) and the "wisdom of repugnance" (cf. L. Kass) have also been mentioned as ideas we can call upon to work in defence of dignity, and, in the case of cybrids, to reject overcoming the species' barriers. These are criteria we need to refer to with some caution, but not completely irrational, also because they invite to carefully evaluate not only the benefits but also the damage they bring. The species' barrier must be protected because of both the anthropocentric privilege and the intrinsic value of what is natural.

"Looking into this, the issue of whether cytoplasmic hybrids are *human* embryos or whether the presence of mitochondrial DNA of animal origin makes them *non-human*, has not yet found a shared response." (p.17). The particular difficulty of this problem comes from the fact that cybrids do not exist in nature, they are not the outcome of the evolution process: cybrids are not part of what has naturally developed but of what is technologically produced, being the result of biotechnological intervention, not the outcome of a phylogenetic process, as the document stresses. From this point of view the creation of cybrids is not about the acquisition of pure knowledge obtained without any

intervention on the object, but is part of that do-act that cannot escape the dichotomy licit-illicit.

Presidenza del Consiglio dei Ministri



**ALTERNATIVE METHODOLOGIES, ETHICS
COMMITTEES AND CONSCIENTIOUS OBJECTION TO
ANIMAL TESTING**

18th of December 2009

INTRODUCTION

The opinion analyses methodologies alternative to animal testing in the context of the 3Rs model (replacement, reduction and refinement of experimentation methodologies applied on animals). The NBC, in line with the Proposal for a Directive of the European Parliament and of the Council on the protection of animals used for scientific purposes and with other international documents on this topic, believes that it is advisable to limit animal testing to what is strictly necessary, reducing their number and controlling suffering and harm, and it expresses the hope for a development of the research and the application of alternative methodologies. The Committee clarifies that the document has not taken into consideration research on human embryonic stem cells as an “alternative” to animal testing, as it feels that the two experimentation methods are not equivalent either from a scientific or an ethical point of view.

The opinion focuses on ethics Committees for animal testing, with particular reference to their establishment, composition and social relevance, hoping for a national and international coordination. In addition, the NBC analyses the 1993 Italian Law No.413 “Regulations on Conscientious Objection to Animal Testing” which recognises that Italian citizens have the right to declare their conscientious objection, recommending that it is publicised, and that adequate formative avenues are set up (also contemplating the teaching of alternative methodologies at university). In the appendix we publish the results of an investigation (conceived and organised by Dr. Maria Paglia) carried out at the scientific faculties of Italian universities in order to monitor the state of application of the Law.

The document has been coordinated by Prof. Luisella Battaglia, with the contribution of Prof. Salvatore Amato, Prof. Adriano Bompiani, Prof. Cinzia Caporale, Prof. Lorenzo d’Avack, Prof. Riccardo Di Segni, Prof. Silvio Garattini, Prof. Laura Guidoni, Prof. Assunta Morresi, Prof. Demetrio Neri, Prof. Monica Toraldo di Francia, Prof. Giancarlo Umani Ronchi. During the working group’s discussion Prof. Thomas Hartung, Prof. Rosagemma Ciliberti, Prof. Simone Pollo, Prof. Anna Laura Stamatii, Prof. Flavia Zucco were consulted.

During the discussion at the plenary meeting, Prof. Luisella Battaglia, Prof. Adriano Bompiani, Prof. Stefano Canestrari, Prof. Roberto Colombo, Prof. Francesco D’Agostino, Prof. Antonio Da Re, Prof. Lorenzo d’Avack, Prof. Riccardo Di Segni, Prof. Carlo Flamigni, Prof. Romano Forleo, Prof. Silvio Garattini, Prof. Laura Guidoni, Prof. Luca Marini, Prof. Assunta Morresi, Prof. Demetrio Neri, Prof. Andrea Nicolussi, Prof. Laura Palazzani, Prof. Vittorio Possenti, Prof. Rodolfo Proietti, Prof. Monica Toraldo di Francia voted in favour of the document. Prof. Cinzia Caporale voted against the document. Prof. Salvatore Amato and Prof. Marianna Gensabella, absent from the plenary meeting, communicated their agreement with the document.

The document is accompanied by a personal remark by Prof. Francesco D’Agostino.

The President
Prof. Francesco Paolo Casavola

PREMISE

1. THE 3Rs MODEL
2. ALTERNATIVE METHODOLOGIES
3. THE PROTECTION OF ANIMALS IN SCIENTIFIC RESEARCH AND THE ROLE OF ETHICS COMMITTEES FOR ANIMAL TESTING
4. CONSCIENTIOUS OBJECTION TO ANIMAL TESTING (LAW N° 413 OF THE 12TH OF OCTOBER 1993)
5. SYNTHESIS AND RECOMMENDATIONS
6. APPENDIX
7. PERSONAL REMARK

Premise

The document comes from the need to bring together, in a balanced and shared way, different values, all worthy of recognition, for example man's wellbeing, the promotion of scientific research, the reduction of suffering for animals subjected to testing, animal welfare in case of veterinary experimentation, and respect for the researchers' personal convictions. So far, animals have had, and will be probably continue to have, a fundamental role in scientific experimentation, but their declared usefulness in the development of knowledge does not diminish our duty to reduce their pain, suffering and harm to a minimum.

In scientific research, animals can be used:

- for general research, aimed mostly or solely to broadening knowledge;
- for research aimed at maximising human benefits (e.g. in order to trial drugs primarily aimed at curing human pathologies);
- for research aimed at maximising benefits for the animals on which the testing is carried out or for similar species (e.g. to test veterinary drugs).

It must be mentioned that currently they are used, for example:

- a. to understand physiological functions, biochemical mechanisms and the complex regulation of hormonal, circulatory and nervous systems, which can only be studied in a living organism;
- b. to create models of human pathology, using techniques of genetic engineering to develop diagnostic tests and therapeutic strategies for the treatment of man and animals;
- c. to study the toxic effects induced *in vivo* by drugs, prostheses, medical devices, food additives and polluting substances;
- d. very rarely for didactic purposes.

In case of commercialisation of pharmaceutical products and more in general of health products, mentioned in points (b) and (c), the Law makes it compulsory to first test them on animals.

Animal testing in Italy is regulated by a series of directives, starting with Legislative Decree 211/92 and the following modifications introduced by the 1993 Ministerial Decree (Legislative Decree n° 116, 27th of January 1992. Implementation of Directive n° 86/609/EEC regarding the protection of animals used for experimental or other scientific purposes). In addition, we must also consider the European Community Recommendation of the 18th of June 2007 relative to the *Guidelines for the accommodation and care of*

animals used for experimental or other scientific purposes 2007/526/EC (published in the Official Journal of the European Union L197, 30th of July 2007). The recommendation is applied to all types of experimentation for scientific purposes, also including research for veterinary use, defining experiment as: “the use of an animal for experimental or other scientific purposes which may cause pain, suffering, distress or lasting harm, including any course of action intended, or liable, to result in the birth of an animal in any such condition, but excluding the least painful methods accepted in modern practice of killing or marking an animal, commonly accepted as humane; an experiment starts when an animal is first prepared for use and ends when no further observations are to be made for that experiment; the elimination of pain, suffering, distress or lasting harm by the successful use of anaesthesia or analgesic or other methods, does not place the use of an animal outside the scope of this definition”.

The regulation explicitly contemplates that animal testing is carried out only if “another scientifically satisfactory method of obtaining the result sought, not entailing the use of animals, is (not) reasonably and practically available”. The Decree also tries to regulate animal testing, so that it is carried out by qualified personnel in order to minimise suffering, and that the animals are reared and stabled in adequate conditions. The testing is subjected to procedures that include the obligation to notify the ministry of all experimentations. In some cases, for example when the testing involves dogs, cats and non human primates (Article 8), it is necessary to have the technical opinion of the Superior Institute for Health.

The experimentation can therefore be considered inadequate both by the Ministry and the Superior Institute for Health, and consequently not be authorised. The procedures must guarantee that the testing is in line with the principle of justification and that the tests are carried out with the least number of animals, with animals that have the lowest neurological development, with methods that involve the lowest level of pain, possibly using anaesthesia, and that, in any case, experimental protocols with the highest probabilities of giving sufficient results are chosen.

The National Bioethics Committee has already tackled more than once questions regarding animal bioethics⁹¹ in which these issues have been mentioned, even if marginally. This document expressly concentrates its attention on two particular aspects: the study, the dissemination and the implementation of alternative methods (A.M.) to animal testing, and the question, strictly connected to this problem, of ethics Committees and conscientious objection (C.O.)⁹². This focus is justified both by the new and promising horizons offered by the development of advanced research methods, and by the significant change that the legal framework has undergone in these last years, gaining a strong ethical connotation with regards to recognising animal welfare. Life in all its facets has an immense

⁹¹ Documents and Opinions: *Caudectomy and concheotomy* (2006); *Bioethical Problems concerning the use of animals in activities linked to human health and well-being* (2005); *Ritual slaughtering and animal suffering* (2003); *Bioethics and veterinary science, animal wellbeing and human health* (2001); *Bioethical guidelines for ethics Committees* (2001); *Opinion on the proposal for the moratorium on human Xenotransplantation clinical trials* (1999); *Animal testing and health of living beings* (1997); *Drugs' trials* (1992).

⁹² Particular thanks go to Prof. Rosagemma Ciliberti, Prof. Thomas Hartung, Prof. Simone Pollo, Prof. Anna Laura Stamatii and Prof. Flavia Zucco, for their contribution to the Working Group.

bioethical value and animal life, in particular, deserves consideration and respect. Inflicting futile, useless, cruel, disproportionate suffering to animals for experimental purposes is absolutely unacceptable, in particular if alternative experimentation methods can be found or promoted.

1. The 3Rs model

The hope of considerably reducing and, in some cases, eliminating the use of animals in testing, is summarised in the “3Rs system”: *Replacement, Reduction, Refinement*, formulated by William Russell and Rex Burch in the volume “The Principles of Human Experimental Technique” (1959). With this trinomial it is respectively intended:

- 1) the “replacement” of animals used in experimentation with alternative methods or, if this is not possible, the use of animals with a lower neurological development;
- 2) the “reduction” of the number of animals to the minimum quantity necessary to obtain scientifically reliable data;
- 3) the “refinement”, that is, the perfecting of procedures that would allow reducing to a minimum the animals’ suffering, distress and harm.

The book by Russell and Burch mostly addressed the scientific community that, in effect, from that moment started to dedicate more attention to the problem of how to employ more “humane” procedures in the treatment of test animals, a problem also developed by the same researchers in relation to the advancement of knowledge. The impulse to tackle the issue of Animal Testing (A.T.) in the wider sense, putting it in a specific bioethical perspective, starts however only in the 1970s, on the wave of publications destined to impose animal issues on the philosophical stage.⁹³

In these years the use of the term “alternative” started to indicate an option in substitution to a given system and not simply another possibility. Therefore, it is not surprising that in 1978 David Smith put forward again the 3Rs model in the volume “Alternative to animal experiments”: a diction that has been considered ambiguous, as it would make us think of the immediate possibility of abolishing animal testing, which, in reality, is not what the 3Rs model proposes.

In 2002 the European Commission financed a bioethics project on “Quality of life” titled “Animal Alternatives: Scientific and Ethical Evaluation” (ANIMALSEE) with the precise task of updating the 3Rs system.

This interdisciplinary project – to which biologists, ethologists, philosophers, pharmacologists and toxicologists participated – has had the merit of allowing an effective dialogue between scholars of different disciplines. This discussion led to a clearer and more shared definition of A.M. and it has shown how the 3Rs model is strongly rooted in a bioethical prospect centred on protecting animal welfare without damaging the interest of the patients awaiting effective therapies.

A combined analysis of the ethical and scientific aspects of testing ensued, which allowed the scientific community to open up to a serene discussion about the issues raised by civil society. We must add that the

⁹³ See in particular P. Singer’s work, *Animal Liberation*, Barnes & Noble, 1975 and T. Regan’s *Animal Rights*, University of California Press, 1983.

alternative based on the 3Rs model represents a journey that links scientific and economic interest and the more specific ethical interest of avoiding – or, at least, reducing as much as possible – animal sacrifice. This need must also be tempered by other important requests of civil society, which expects from scientific research remedies for illnesses and the reduction of environmental toxicity.

In order to evaluate the 3Rs model, we must stress that, with regards to the first R (“replacement”), at the moment there are no methods that allow the full verification of the efficacy and safety of a substance or a drug without using a living organism. However, in the last decade significant steps towards the development of alternative methods have been made, consisting primarily by *in vitro* techniques; that is, cellular and tissue cultures, micro-organisms, image technologies, mathematical and IT models. Still in the current state of knowledge, *in vivo* experimentation, although in many cases difficult to extrapolate to the human situation, continues to represent, today, the best available way to tackle, for example, the complex effects of drugs in the reduction of heart attacks or strokes, the action on appetite and satiety, analgesic action, the effects on the damages caused by cerebral trauma, hypertensive activity and so on. In addition we observe that it is not so much the extrapolation from a single animal species to man that counts, it is instead the possibility of a series of observations in many animal species that allows us to construct a catalogue of knowledge useful to understand if we must test on man and, if so, what are the possible toxic and therapeutic effects to take into consideration. In particular, techniques of genetic engineering allow us to create new models of human illnesses in test animals, with a better chance of extrapolation.

Also, some Committee members believe that alternative methodologies, in the current state of knowledge, must be intended not as a substitution, but as a complement to *in vivo* animal testing. In the hope that in the future alternative methodologies can be carried out and developed.

The second R (“reduction”) has the purpose of both reducing the number of animals used, and avoiding an excessive repetition of tests on animals. Further progress in the mutual recognition between European Union and non-European Countries, with regards to the procedures for the registration of drugs, could have a considerable effect in reducing the number of animals used for scientific or technological purposes. Important, in this sense, are the technological developments that let us carry out repeated sampling in a non-invasive way, allowing us, for example, to follow the same animals, without having to sacrifice them at different times, through CT scans, nuclear magnetic resonance, Doppler ultrasound scans, etc.

The third R (“refinement”) contemplates: planning research with sophisticated programming instruments, in order to reduce the suffering, distress and harm endured by the animals to a minimum; the institution of better testing procedures; the housing of the animals in environments suitable to each species, within a frame of more efficient Animal Care, which is also indispensable for the reliability of *in vivo* experimentation.

Many steps forward have been made thanks to the progress of knowledge in cellular and molecular mechanisms at the basis of physiological and pathological processes. Informatics has also opened horizons and unexpected possibilities for the elaboration of data, the construction of models, the theoretical verification of hypotheses. The technology associated

to this new knowledge has evolved very rapidly, also pressed by the needs of the market.

Therefore, the scientific community today has extremely broad possibilities of study, which, seen in perspective, could allow to steadily decrease the use of animals and to improve testing conditions. Thanks to this progress it is also possible to think about a concrete implementation of the 3Rs model.

2. Alternative methodologies

In 1986 Europe decided to regulate this sector with the *European Convention for the Protection of Vertebrate Animals Used for Experimental or Other Scientific Purposes*⁹⁴ (1986/123), to which followed the Directive *On the Approximation of Laws, Regulations and Administrative Provisions of the Member States Regarding the Protection of Animals Used for Experimental and Other Scientific Purposes* (1986/609).

On the basis of the Directive, at the European level an intense activity of research and validation (determination of the reliability and reproducibility of a method) developed, aimed both at identifying new *in vivo* methods which could be used for a regulatory activity, and at modifying some of the existing *in vivo* methods in order to reduce the number of animals used and minimise suffering and harm. The majority of the Countries of the European Community intervened, with appropriate regulations, to limit the use of animals, instituting specific commissions for the authorisation and control of the methods of research and experimentation. In particular, in Italy the Directive was transposed through Legislative Decree n° 116, 27th of January 1992, which expressly indicated the principle of preference of alternative methods (Article 17.1b). Circular n°6 by the Ministry of Health, of the 14th of May 2001, recalled the experimenters' attention to the fact that "for any research activity the impossibility of using other scientifically valid alternatives to the use of animals must be demonstrated".

In the last twenty years, the scientific basis on which the Directive was established has changed considerably thanks to an evolution of the techniques in the field of animal testing, and European authorities – also taking into account the fact that the Directive's guidelines, keeping in mind the text of the abovementioned Convention, had a character that was more political than legal, and was indicative and open to free interpretations rather than tending to harmonise things -, proposed to revise them. The Proposal for a Directive stresses that animals have an intrinsic value that must be respected. The use of animals in the procedures also raises concerns in public opinion. Therefore, animals must always be treated as sentient creatures and their use in scientific procedures must be limited to those fields that promote scientific progress and are ultimately beneficial to the health of man and animals and the environment. For this reason, in the text there are a whole series of reinforcing measures for the protection of animals still used in scientific procedures that have as their focus: a) the increasingly more

⁹⁴ The Convention was adopted on the 31st of May 1985 and it was sent to be signed by the member States of the Council of Europe and those of the European Economic Community on the 18th of March 1986. It came into force on the 1st of January 1991, it was signed in 1987 by the European Community which, however, did not ratify the text before March 1998.

appropriate application of the 3Rs model; b) the development of alternative methodologies. A first result towards this has already been reached with Directive n° 2003/15/CE that set up precise limitations for the sale of cosmetics tested on animals.

Another important contribution derived from the institution, in 1991, of the *European Centre for the Validation of Alternative Methods* (ECVAM), an institute of technical consultancy to the European Commission, whose task is to study, promote and “validate” the procedures that do not contemplate the use of animals. As “validation” of alternative methods, we intend the overall process through which the reliability and the pertinence of a certain test for a specific purpose are established.

An effect of the institution of the ECVAM has been the establishment, in each member state of the European Union, of “National Platforms for Alternative Methods” (IPAM in Italy), coordinated by the *European Consensus of Platforms on Alternatives* (ECOPA), which see the participation of industries, government bodies, research institutes and animal protection associations.

In this framework, a partnership between the European Commission and some companies in different industrial sectors (EPAA) has been established, in order to promote the development of new methods as modern and alternative approaches to animal testing, to guarantee the safety and the efficacy of chemical substances. The programme – 5 years long – is monitored through the annual conferences “Europe goes alternative”.

In April 2009, the ECVAM signed a cooperation agreement with the corresponding organisms in the United States (ICCVAM), in Japan (JACVAM) and in Canada (*Environmental Health Science and Research Bureau*), to improve the coordination at the international level in order to identify and disseminate alternative methods that can be reproduced and are based on unquestionable scientific foundations, dispelling any fear of risks for our health.

Moreover, the European Community has been, for some years, increasing research funding: the VII Framework Program (2007-2013) anticipates funds for projects aimed at finalizing alternatives to animal testing in medical research. We must however remember that if animals represent an often insufficient model of the human body, *in vitro* tests based on the use of cells cultivated outside of the complexities of a living organism, without the intervention of hormonal, humoral and nervous regulatory systems, would be even less representative. Even embryonic stem cells, animal and human, because of the peculiarity of their epigenetic and metabolic profile, are not representative of an experimental model alternative to that of an adult organism.

Therefore we face a considerable increase in the focus and sensitivity towards ethical and scientific problems relative to A.T. which, without overlooking the importance of the traditional models, forces us to research new, less invasive perspectives, more focused on finding the right balance between the needs of scientific knowledge and respect for animal life. As hoped for in the European Proposal for a Directive: “In addition to animal welfare benefits, alternative methods also have the potential to provide robust information through quality-controlled, state-of-the-art tests which could be faster and less cost-intensive than classical animal-based tests”.

The NBC highlights that in certain environments, even institutional, the expression “methods alternative to animal testing” includes also tests on human embryonic stem cells.

The NBC does not believe that this is the place to enter the debate about testing of human embryonic stem cells, and refers to previous⁹⁵ and eventual future documents.

The NBC feels that it is unacceptable to consider “alternative”, in the sense of “scientifically and ethically equivalent”, methods involving tests on adult animal organisms and methods involving experiments on human embryonic cells.

Some NBC members⁹⁶ in any case believe that any experimentation that involves the destruction of human embryos is illicit and morally unjustifiable, including those aimed at minimising animal testing at the cost of testing on human embryos.

3. The protection of animals in scientific research and the role of ethics Committees for animal testing

The quality of scientific research and the reliability of the results have been strictly linked to a good laboratory practice and to animal welfare. It is a known principle that using animals that are already in a state of physical or psychological suffering in research can compromise the reliability and the reproducibility of the test results. The protection of lab animals, as contemplated by the law, is therefore intimately linked to the interests of the research and, in principle, there should not be any conflict between these interests and the need, increasingly felt, of a qualified *animal care*, that is, a lab animal science that includes the study of their biology, consideration for their rearing and environmental needs, the prevention and the treatment of eventual illnesses, the optimisation of the testing techniques and the improvement of anaesthesia, analgesia and euthanasia. From the beginning of the 1900s many steps forward have been made towards the optimisation of the quality and the animals’ state of health, and the standardisation of environmental and housing conditions to ensure animal welfare. This progress has certainly been supported not only by issuing suitable regulations, but – if the link between the interests of the research and an increasingly qualified *animal care* – also by the sense of responsibility of the researchers and the establishments in which they operate. Proof is that many research centres in Italy and in Europe have instituted internal control bodies, on the example of what has already happened, from the middle of the 1980s, in United States and Canada with the creation of *Institutional Animal Care and Use Committees* (IACUC). This is an evident sign that the presence of ethics

⁹⁵ See the NBC documents: *The destiny of embryos resulting from medically assisted procreation (MAP) and not complying with the conditions for implantation* (2007); *Use for research purposes of cell lines h1 and h9 derived from human embryos* (2004); *Research using human embryos and stem cells* (2003); *NBC's opinion on the therapeutic use of stem cells* (2000); *Identity and status of the human embryo* (1996)

⁹⁶ Prof. Amato, Prof. Bompiani, Prof. D’Agostino, Prof. Da Re, Prof. Di Pietro, Prof. Fattorini, Prof. Forleo, Prof. Morresi, Prof. Nicolussi, Prof. Palazzani, Prof. Possenti, Prof. Proietti, Prof. Scaraffia, Prof. Umani Ronchi agreed. Prof. Gensabella expressed her agreement although she was absent from the plenary meeting.

Committees (named in a variety of ways in the different establishments) is not felt as a sort of limitation, but as a valid help to pursue the objectives indicated by the laws in force on this issue. The dissemination of these bodies has occurred voluntarily, as neither the current European Directive nor Legislative Decree n° 116/92 include specific guidelines that require the presence and the implementation of these Committees in the establishments involved.⁹⁷

An important step forward in the direction towards which a part of the world of animal testing is already moving, will happen if the abovementioned Proposal for a Directive, which revises the 1986 Directive, will become operative. This Proposal starts with observing the existence of an evident change in the cultural attitude of European society towards the importance attributed to animal welfare, also proven by the numerical success of public consultations launched on this issue in the past few years.⁹⁸ Looking at this, we must accept that the measures currently in force with regards to the protection of animal welfare do not sufficiently respond to the expectations and are not able to guarantee an adequate transparency in this extremely controversial sector. As we said, it is true that many research centres have already, voluntarily, created ethics Committees, and that the measures to control and inspect the observance of the law exist and work adequately: however there is no body giving an independent, public guarantee that goes beyond respecting the regulations: this is currently, in effect, entrusted to the researchers' self-discipline. We don't want here in any way to put into doubt their good faith but, looking at it carefully, the current situation is the same as that which, around the second half of the 1960s, led to the creation of ethics Committees for humans trials: independent bodies as guarantee for public opinion and researchers, especially in a very controversial sector like the one under scrutiny.⁹⁹ To respond to public opinion's expectations, the European Commission put forward the proposal of constituting, in every place rearing and using research animals, a "permanent and independent body of ethical assessment", with the fundamental task of promoting the ethical debate within the establishment, stimulating a climate favourable to care and providing the tools to practically and quickly apply the most recent technical and scientific developments inherent to the 3Rs principles. As we said, this has been largely anticipated by many public and private establishments (at least those where testing is carried out), however, clearly the presence of these bodies will have more strength if they are dictated by the law.

We also highlight that these bodies' task will not only be to encourage the acquisition of a growing awareness of the ethical issues involved in animal testing. The most relevant novelty of the Proposal for a revision of the Directive is in the fact that, for the first time (see Article 35) the concession of an authorisation to research projects by the competent authorities is

⁹⁷ In this sense we stress the importance of Bill No. 258, *Directives for the protection of animals used for scientific or technological purposes*, that anticipates the compulsory institution of ethics committees, internal to the establishments where the testing takes place, which should support the experimentation and follow its evolution (www.senato.it/leg/15/BGT/Schede/Ddliter/24691.htm).

⁹⁸ The consultation on the European Union's action Program for animal protection and welfare, received about 45,000 answers and slightly less (42,500) were received by the consultation on Directive 86/609/CEE.

⁹⁹ In the document *Guidelines for ethics Committees in Italy* of the 13th of July 2001, the NBC already advanced the idea that ethics Committees for pharmacological and clinical trials on human beings should also be given jurisdiction, after being integrated with a zoologist and a clinical veterinary, over the passing of protocols relative to animal testing.

subordinated to the acquisition of a positive ethical-scientific evaluation. This ethical evaluation must verify that the project satisfies a large number of requirements, detailed in the following Article 37¹⁰⁰, it must accompany the release of the authorisation to the research project and, in some cases (those involving “no or mild” procedures), it can even substitute the non-technical report that must be included in the request of authorisation. The task of compiling this ethical evaluation belongs to the permanent ethical assessment body discussed in Article 26, which also has the task of re-examining every year all projects lasting longer than 12 months, eventually proposing, on the basis of the results, the modification or the renewal of the authorisation. These are therefore very important tasks, to satisfy which, however, the composition of these bodies in the manner contemplated in Article 25 does not seem adequate. In fact, it is anticipated that these bodies will be made up of a veterinary doctor, the persons responsible for the animals’ welfare and care *within the establishment* and, in the case of a research organisation, of a selected member of the research personnel. In light of previous experiences, both with animals and with humans, this make-up is unsatisfactory in order to offer public guarantee that the research is ethical. It would be appropriate to expect that at least some members of these bodies are external to the establishment and that amongst them there is a bioethicist expert in animal welfare.

The last novelty of this revision Proposal is the creation of a national Committee for animal ethics and welfare (Article 47), which on the one hand would advise the competent authorities and the web of permanent Committees of ethical evaluation in the single establishments, and, on the other hand, would cooperate with similar Committees in other countries, in order to share *best practices* within the European Union. In this case as well, we must highlight that some European countries (but also non-European) already have this kind of set-up, which however is missing in our country: after all, we must remember that in Italy there is no central institution also in the field of pharmacological and clinical trials on human beings, although it was contemplated in Article 6 of the Decree of the 18th of March 1998.

Every establishment that carries out animal testing should have an ethics Committee for animal testing (ECAT) with the task of evaluating research projects from a scientific and ethical point of view. The ECAT should establish the real need to use animals, verifying that there are no alternative methods of obtaining the same results. In addition, it should guarantee that the project respects the principles inherent to the concepts of reduction and refinement. The ECAT’s task should be to monitor the housing conditions with particular attention to rearing and animal welfare. The ECAT should be made-up of researchers, clinical and non-religious personnel, with the presence of members that are external to the establishment concerned.

In Italy, ECATs should substitute the current body contemplating an authorisation to carry out research projects on animals to be given centrally (Ministry of Health and Superior Institute for Health). ECATs’ deliberations – similarly to what happens for human trials – should be notified to an observatory recording all projects of experimental research that include the use of animals. The observatory should have the function of supervising;

¹⁰⁰ Amongst the criteria to be met: scientific justification, according to the analytical directives anticipated in previous articles.

elaborating the data received highlighting eventual anomalies between the protocols and their practical realisations.

4. Conscientious objection to animal testing (Law n° 413, 12th of October 1993)

The growing sensitivity of modern society towards animals found a significant expression in Law n° 413, 12th of October 1993, which recognised the right to “citizens who, in obedience to their conscience, exercising their freedom of thought, conscience and religion recognised by the Universal Declaration of Human Rights, by the Convention for the Protection of Human Rights and Fundamental Freedoms and by the International Covenant on Civil and Political Rights, oppose violence on all living beings” to “declare their conscientious objection to every act connected to animal testing” (Article 1).

The Law No.413/1993 contemplates this possibility for “doctors, researchers and healthcare personnel in the roles of qualified, technical, nursing professionals and for the university students concerned”, who, once they have declared their conscientious objection, “are not required to take part directly in the activities and interventions specifically and necessarily directed to animal testing” (Article 2).

With regards to the way this right can be exercised, article 3 clarifies that “conscientious objection is stated at the time of applying for employment or participating in a public contest”, “university students declare their conscientious objection to the professor teaching the course within which there can be activities or interventions of animal testing, at the beginning of the course”, “the declaration of conscientious objection can be withdrawn at any time”. These regulations presume that these are profound existential choices that imply, in their exercise and evaluation, significant coherence and continuity.

Of particular interest is subsection 5 of Article 3, according to which “All public and private establishments legally allowed to carry out animal testing are obliged to communicate to all workers and students their right to exercise conscientious objection to animal testing. The establishments are also obliged by the current law to set up a form for the declaration of conscientious objection to animal testing”.

Unfortunately we must acknowledge that this double obligation – expressly contemplated by the law -, has been largely overlooked and that a very limited number of faculties have belatedly carried out those duties only after formal requests aimed at ensuring the outmost dissemination of the law.

Article 4 ratifies the prohibition of discrimination stating in subsection 1 that “no-one can be made to suffer negative consequences for refusing to practice or to cooperate to the execution of animal testing”, and supporting (subsection 2) the objectors’ right – “whether they are public or private employees, to be allocated, within the existing organic apparatus, to activities other than those requiring animal testing, retaining the same qualification and the same salary”.

As we can see, these are imperative instructions that include, in the following subsection 3, even universities, whose “competent bodies must make the attendance to laboratory exercises involving animal testing,

voluntary”, and require the activation, “within courses”, “before the beginning of the academic year following the date of the coming into force of the current law, teaching methods that do not include activities of interventions of animal testing in order to pass the exam”.

Once again we recommend the faculties’ secretarial offices to ensure “the outmost dissemination of the right to conscientious objection to animal testing”.

Conscientious objection has, in our legislation, an exceptional nature and it is contemplated in clear laws, within which the sacrifice of inviolable rights like human life is believed to justify conscientious objection. Examples of this are conscientious objection to military service (Law n° 772, 15th of December 1972), conscientious objection to the voluntary interruption of pregnancy (Law n° 194, 22nd of May 1978) and conscientious objection to the application of medically assisted procreation techniques (Law n° 40, 19th of February 2004).

Therefore, it has been highlighted that, with the 1993 Law, the motivated refusal to inflict harm and suffering to animals has in some way become a part of the ethical basis for the development of personal identity and the promotion of social conscience (Articles 2 and 3 of the Constitution).

We must also observe that if Law n° 413/93 undoubtedly recognises the individual’s freedom of conscience as an inviolable human right and therefore protects a subjective good-value, it attributes significant relevance also to the objective good-value animal welfare/life. In this sense, conscientious objection to animal testing, with its connections to animalist laws – globally inspired to the general principle “do not cause suffering, do not harm animals in vain” -, represents a turning point in our legislation for its high bioethical value.

In this perspective we can also place the new formulation of Article 727 of the Penal Code¹⁰¹.

Years after, it is necessary to observe how the law has not yet been fully implemented. Currently – with regards to the situation in Europe – there is only a teaching position at the University of Konstanz and three courses, respectively at the universities of Hannover, Erlangen and Utrecht. In Italy still little has been done, despite the law establishes – as we have seen – the institution of “teaching methods that do not include activities of interventions of animal testing in order to pass the exam”.

To monitor the knowledge of the law and its application, the working Group also sent a questionnaire to all scientific faculties of Italian Universities (pharmacy, medicine and surgery, mathematical, physical and natural sciences, veterinary medicine, biotechnological sciences) with questions reported in the appendix, together with the results of the investigation.

¹⁰¹ Article 727 Penal Code “Anyone who abandons domesticated animals or animals that have become accustomed to captivity is punishable with up to a year in prison and from 1,000 and 10,000 euros. The same penalty applies to anyone keeping animals in conditions incompatible with their nature, and causing grave suffering.”

Synthesis and recommendations

In line with the “Proposal for a Directive of the European Parliament and the Council on the protection of animals used for scientific purposes” and with the most important international Documents on this issue, the NBC recommends:

1. a better international coordination for the development and the validation of alternative methods aimed at producing the same level of scientific evidence as procedures conducted on animals, but without using them, or using a smaller number or involving less painful procedures;
2. the institution of Ethics Committees for animal testing exercising the function of discussing, approving and monitoring the complex problems relative not only to carrying out “in vivo” research projects but also to rearing methods and to managing the welfare of the test animals; the NBC recommends the presence, in the composition of the local bioethics Committees for animal testing, of some members who are external to the establishment;
3. the formalisation – within the establishments carrying out animal testing – of a formative course for all scientific and auxiliary personnel in order to improve professionalism and ethical awareness, referring to the principles of the 3Rs;
4. the full implementation of Law n° 413, 12th of October 1993, Regulations on Conscientious Objection to Animal Testing, which recognises (Article 1) to Italian citizens the right to declare their conscientious objection to animal testing.

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<http://www.ministerosalute.it>

Appendix

The working Group sent a questionnaire to all scientific faculties in Italian Universities (pharmacy, medicine and surgery, mathematical, physical and natural sciences, veterinary medicine, biotechnological sciences) with the following questions:

- **In your faculty, have students been informed of the possibility of exercising the right to conscientious objection, as anticipated in Article 3 point 5 of Law n° 413/93?**

(All public and private establishments that legally carry out animal testing are obliged to inform all workers and students of their right to exercise conscientious objection with regards to animal testing. The establishments themselves are also obliged to set up a form for the declaration of conscientious objection to animal testing by the current Law.)

- **Have there been cases of students or workers making such a request?**
- **Have you implemented “teaching methods that do not include activities or interventions of animal testing in order to pass the exam”, as required by Article 4, point 3 of the Law n° 413/93?**

(“In Universities, the competent bodies must make the attendance to laboratory exercises involving animal testing, voluntary. Within courses must implemented, before the beginning of the academic year following the date of the coming into force of the current law, teaching methods that do not include activities of interventions of animal testing in order to pass the exam. The faculties’ secretarial offices must ensure the outmost dissemination of the right to conscientious objection to animal testing.”)

For this investigation 128 scientific Faculties have been identified and all answered.

The answers to the questions, which arrived both by post and e-mail (as also indicated in the letter),¹⁰² have been given by the Faculties’ Headmasters or by their delegate, in 2 cases a resume’ of the Faculty’s Council was sent.

All were sent a letter of thanks by the NBC for the collaboration offered and the NBC’s commitment to make the results known by drawing up a document with this investigation.

Results report

- With regards to the **first question**, 87 answered that they had implemented communication to make the possibility of conscientious objection known, 13 did not answer, 28 stated that, as they did not carry out any animal testing activity they had not organised any way to disseminate this regulation.

¹⁰² All the answers were filed, included in the table following this document, included in a file shared by the NBC under “conscientious objection”, listed on a paper matching/personal file, both e-mails and original letters are preserved at the Group’s secretarial offices.

- With regards to the **second question**, 29 specifically answered that, as they did not carry out any animal testing, they did not have any objector, in 10 Faculties some exercised conscientious objection, in the remaining 89 faculties there had not been any case of objection.
- With regards to the **third question**, 86 Faculties – not having animal testing in their courses or their thesis – do not carry out any Alternative Methodologies, 26 Faculties instead implemented A.M., Pisa instituted the National Interuniversity Association of Ethics Committees for Animal Testing (NIAECAT), 16 Faculties carry out animal testing with traditional methods.

FACULTY	CITY	answer	question 1 conscientious objection	question 2 objectors	question 3 alternatives
Faculty of Pharmacy	66013 Chieti (Chieti Scalo)	YES	NO	NO	NA
Faculty of medicine and surgery	67010 Coppito L'Aquila	– YES	YES	NA	NA
Faculty of mathematical, physical and natural sciences	67010 Coppito L'Aquila	– YES	NA	NA	NA
Faculty of veterinary medicine	64100 Teramo	YES	YES	NO	NA
Faculty of mathematical, physical and natural sciences	85100 Potenza	YES	NA	NA	NA
Faculty of Pharmacy	88021 Roccelletta di Borgia (CZ)	YES	YES	NO	NA
Faculty of medicine and surgery	88100 Catanzaro	YES	YES	NO	NA
Faculty of Pharmacy	87036 Arcavacata di Rende (CS)	YES	YES	NO	NA
Faculty of mathematical, physical and natural sciences	87036 Arcavacata di Rende (CS)	YES	YES	NO	NO
Faculty of medicine and surgery	80138 Naples	YES	NO	NO	NO
Faculty of mathematical, physical and natural sciences	81100 Caserta	YES	NA	NA	NA
Faculty of mathematical, physical and natural sciences	82100 Benevento	YES	YES	NO	YES
Faculty of Pharmacy	80131 Naples	YES	YES	NO	NA/NO
Faculty of medicine and surgery	80131 Naples	YES	YES	NO	NA
Faculty of veterinary medicine	80137 Naples	YES	NO	NO	NO
Faculty of Biotechnological sciences	80125 Naples	YES	NA	NA	NA
Faculty of mathematical, physical and natural sciences	80134 Naples	YES	YES	NO	NO
Faculty of Pharmacy	84084 Fisciano (SA)	YES	NA	NA	NA
Faculty of mathematical, physical and natural sciences	84081 Baronissi (SA)	YES	NA	NA	NA
Faculty of industrial chemistry	40136 Bologna	YES	NO	NO	NO
Faculty of Pharmacy	40126 Bologna	YES	YES	NO	NO
Faculty of medicine and surgery	40125 Bologna	YES	YES	NO	NA
Faculty of veterinary medicine	40064 Ozzano dell'Emilia (BO)	YES	YES	10	YES
Faculty of mathematical, physical and natural sciences	40126 Bologna	YES	NA	NA	NA
Faculty of Pharmacy	44100 Ferrara	YES	YES	NO	YES
Faculty of medicine and surgery	44100 Ferrara	YES	YES	NO	NA
Faculty of mathematical, physical and natural sciences	44100 Ferrara	YES	YES	NO	NA
Faculty of Pharmacy	41100 Modena	YES	YES	NO	NA

Faculty of medicine and surgery	41100 Modena	YES	YES	NO	NA
Faculty of mathematical, physical and natural sciences	41100 Modena	YES	NA	NA	NA
Faculty of Pharmacy	43100 Parma	YES	YES	NO	YES
Faculty of medicine and surgery	43100 Parma	YES	NO	NO	NO
Faculty of veterinary medicine	43100 Parma	YES	YES	NO	NA
Faculty of mathematical, physical and natural sciences	43100 Parma	YES	YES	NO	NA
Faculty of Pharmacy	34127 Trieste	YES	YES	NO	NA
Faculty of medicine and surgery	34149 Trieste	YES	YES	NO	NA
Faculty of medicine and surgery	33100 Udine	YES	NA	NA	NA
Faculty of veterinary medicine	33100 Udine	YES	YES	NO	NO
Faculty of mathematical, physical and natural sciences	33100 Udine	YES	NO	NO	NA
Faculty of medicine and surgery “biomedical campus”	00128 Rome	YES	NA	NA	NA
Faculty of mathematical, physical and natural sciences	01100 Viterbo	YES	YES	NO	NA
Faculty of Pharmacy	00185 Rome	YES	YES	NO	YES
Faculty of medicine and surgery	00161 Rome	YES	YES	NO	NA
Second faculty of medicine and surgery	00189 Rome	YES	YES	NO	YES
Faculty of mathematical, physical and natural sciences	00185 Rome	YES	YES	4 or 5	YES
Faculty of medicine and surgery – Tor Vergata University	00133 Rome	YES	YES	NO	NA
Faculty of mathematical, physical and natural sciences	00133 Rome	YES	YES	NO	NA
Faculty of mathematical, physical and natural sciences – Roma Tre University	00146 Rome	YES	YES	NO	YES
Faculty of Pharmacy	16132 Genova	YES	YES	NO	YES
Faculty of medicine and surgery	16132 Genova	YES	YES	NO	NA
Faculty of mathematical, physical and natural sciences	16132 Genova	YES	YES	NO	NA
Faculty of medicine and surgery “A. Gemelli”	00168 Roma	YES	YES	NO	NA
Faculty of mathematical, physical and natural sciences	25121 Brescia	YES	NA	NA	NA
Faculty of medicine and surgery	21100 Varese	YES	NA	NA	NA
Faculty of mathematical, physical and natural sciences – Como	22100 Como	YES	NA	NA	NA
Faculty of medicine and surgery	25123 Brescia	YES	YES	NO	NA
Faculty of Pharmacy	20133 Milan	YES	YES	NO	N/A
Faculty of medicine and surgery	20122 Milan	YES	YES	1	YES
Faculty of veterinary medicine	20133 Milan	YES	YES	4	YES
Faculty of mathematical, physical and natural sciences	20133 Milan	YES	YES	Very	YES

natural sciences					rarely	
Faculty of medicine and surgery – Milano Bicocca University	20050 Monza	YES	NO	NO	YES	
Faculty of Pharmacy	27100 Pavia	YES	YES	NO	N/A	
Faculty of medicine and surgery	27100 Pavia	YES	YES	NO	N/A	
Faculty of mathematical, physical and natural sciences	27100 Pavia	YES	YES	NO	N/A	
Faculty of medicine and surgery Vita San Raffaele University	20132 Milan	YES	N/A	N/A	N/A	
Faculty of medicine and surgery	60020 Torrette di Ancona	YES	YES	YES	YES	
Faculty of mathematical, physical and natural sciences	60131 Ancona	YES	YES	YES	YES	
Faculty of Pharmacy	62032 Camerino (MC)	YES	N/A	N/A	N/A	
Faculty of veterinary medicine	62024 Matelica (MC)	YES	YES	NO	YES	
Faculty of sciences and technologies	62032 Camerino	YES	YES	NO	N/A	
Faculty of Pharmacy	61029 Urbino	YES	YES	NO	N/A	
Faculty of mathematical, physical and natural sciences	61029 Urbino	YES	YES	10	N/A	
Faculty of mathematical, physical and natural sciences	86170 Isernia	YES	NO	NO	YES	
Faculty of Pharmacy	28100 Novara	YES	N/A	N/A	N/A	
Faculty of medicine and surgery	28100 Novara	YES	YES	NO	N/A	
Faculty of Pharmacy	10126 Turin	YES	YES	NO	N/A	
Faculty of medicine and surgery	10126 Turin	YES	YES	NO	N/A	
Faculty of veterinary medicine	10095 Grugliasco (TO)	YES	YES	NO	N/A	
Faculty of mathematical, physical and natural sciences	10125 Turin	YES	YES	N/A	N/A	
Faculty of Pharmacy	70126 Bari	YES	YES	NO	N/A	
Faculty of medicine and surgery	70124 Bari	YES	YES	NO	N/A	
Faculty of veterinary medicine	70010 Valenzano (BA)	YES	YES	NO	NO	
Faculty of biotechnological sciences	70126 Bari	YES	N/A	N/A	N/A	
Faculty of mathematical, physical and natural sciences	70125 Bari	YES	YES	NO	N/A	
Faculty of medicine and surgery	71100 Foggia	YES	YES	NO	N/A	
Faculty of mathematical, physical and natural sciences	73100 Lecce	YES	YES	Rare cases	N/A	
Faculty of pharmacy	09126 Cagliari	YES	YES	NO	YES	
Faculty of medicine and surgery	09124 Cagliari	YES	YES	NO	N/A	
Faculty of mathematical, physical and natural sciences	09126 Monserrato (Ca)	YES	YES	NO	NO	
Faculty of pharmacy	07100 Sassari	YES	YES	NO	N/A	
Faculty of medicine and surgery	07100 Sassari	YES	NO	NO	N/A	
Faculty of veterinary medicine	07100 Sassari	YES	YES	YES	NO	

Faculty of mathematical, physical and natural sciences	07100 Sassari	YES	N/A	N/A	N/A
Faculty of pharmacy	95125 Catania	YES	YES	NO	N/A
Faculty of medicine and surgery	95125 Catania	YES	YES	NO	NO
Faculty of mathematical, physical and natural sciences	95123 Catania	YES	NO	NO	NO
Faculty of pharmacy	98168 Messina	YES	YES	NO	N/A
Faculty of medicine and surgery	98125 Messina	YES	YES	NO	N/A
Faculty of veterinary medicine	98123 Messina	YES	NO	NO	NO
Faculty of mathematical, physical and natural sciences	Sant'Agata – 98166 Messina	YES	YES	NO	N/A
Faculty of pharmacy	90123 Palermo	YES	YES	NO	N/A
Faculty of medicine and surgery	90127 Palermo	YES	YES	NO	N/A
Class of mathematical, physical and natural sciences	56126 Pisa	YES	YES	NO	N/A
Scuola Superiore di studi universitari di perfezionamento Sant'Anna	56127 Pisa	YES	YES	NO	N/A
Faculty of pharmacy	50134 Florence	YES	YES	NO	YES
Faculty of medicine and surgery	50134 Florence	YES	N/A	N/A	N/A
Faculty of mathematical, physical and natural sciences	50121 Florence	YES	N/A	N/A	N/A
Faculty of pharmacy	56124 Pisa	YES	YES	YES	NO
Faculty of medicine and surgery	56126 Pisa	YES	N/A	N/A	N/A
Faculty of veterinary medicine	56124 Pisa	YES	N/A	NO	Ethics Committee
Faculty of mathematical, physical and natural sciences	56126 Pisa	YES	YES	NO	N/A
Faculty of pharmacy	53100 Siena	YES	YES	NO	YES
Faculty of medicine and surgery	53100 Siena	YES	N/A	N/A	N/A
Faculty of mathematical, physical and natural sciences	53100 Siena	YES	YES	NO	N/A
Faculty of mathematical, physical and natural sciences	38050 Trento	YES	NO	NO	N/A
Faculty of pharmacy	06126 Montebello (PG)	YES	YES	NO	YES
Faculty of medicine and surgery	06126 Montebello (PG)	YES	YES	NO	NO
Faculty of veterinary medicine	06126 Montebello (PG)	YES	YES	NO	YES
Faculty of mathematical, physical and natural sciences	06123 Perugia	YES	YES	NO	YES
Faculty of mathematical, physical and natural sciences	30123 Venice	YES	YES	YES	YES
Faculty of pharmacy	35131 Padova	YES	N/A	N/A	N/A
Faculty of medicine and surgery	351281 Padova	YES	YES	NO	N/A

Faculty of veterinary medicine	35020 Legnano (PD)	YES	NO	NO	N/A
Faculty of mathematical, physical and natural sciences	35121 Padova	YES	N/A	N/A	YES
Faculty of medicine and surgery	37134 Verona	YES	NO	NO	N/A
Faculty of mathematical, physical and natural sciences	37134 Verona	YES	N/A	N/A	N/A

Regarding conscientious objection supported by Law No.413/1993

Personal remark by Prof. Francesco D'Agostino

I believe that the *National Bioethics Committee* did well to dedicate its attention to the problem of methodologies alternative to animal testing and to draw up a document in which we take note with satisfaction of the existence in our legislation of a Law, the 413/1993, with which the right to conscientious objection (CO) for every act linked to animal testing. I also feel that it is commendable that the NBC has stigmatised the fact that still in some ways two fundamental obligations contemplated by law as duties of the competent establishments, are not met, that of making known to all employees and students their right to exercise CO to animal testing and that of putting in place a form to formalise this declaration.

I believe however that it would have been appropriate for the NBC to go a step further, recalling its readers' attention to its document on the *paradoxical* character of Law n° 413/1993. Article 1 of this Law, in fact, bases the right of CO to animal testing on the due respect our legislation gives to citizens who, *in obedience to their conscience, in the exercise of their freedom of thought, conscience and religion recognised by the Universal Declaration of Human Rights, by the Convention for the Protection of Human Rights and Fundamental Freedoms and by the International Covenant on Civil and Political Rights, oppose violence on all living beings*. Now, what is the paradox? This: there is no doubt that, like all other animals, man is also a living being; it seems therefore unjustified the fact that the law – *starting with the premises abovementioned* – does not anticipate that the right to CO can be exercised also towards any kind of experimentation involving living human beings as well as towards animal testing. It is a fact that the text of the law, as well as its explicit title (*Regulations on Conscientious Objection to Animal Testing*), although it takes *violence on all living beings* seriously, does not make any reference to the relevant bioethical problems raised by practices of experimentation on man and to the indubitable problems of conscience that can arise in those carrying out the experiments.

The paradox highlighted, like any paradox, needs to be resolved or in any case requires adequate reflection. There are no other regulations, in our legislation, that explicitly (the way Law n° 413/1993 is explicit) guarantee CO to experimentation on man and we don't understand why. Therefore I think that a *bioethical* reflection on this *absence* is indispensable, as it has been going on *scandalously* now for more than fifteen years, also in order to verify if it is possible to give a convincing answer to the malicious, but almost irresistible observation, repeated by many, that *some* supporters of animal bioethics (in particular those who at the time were the promoters of Law n° 413/1993) suffer from a serious ideological short-sightedness, which would lead them to give very little attention to "human animals", in comparison to "non-human animals". I feel that it is this short-sightedness affecting, as already stated, *some, but not all animalists*, that makes their bioethics fragile and supports the idea, wrong in itself, but consolidated by the media, that they are in fact a sect.

Effectively, this document could have been a good opportunity to recall attention to the fact that CO towards experimental practices of bioethical relevance is a value of the outmost importance that must be rigorously protected and that must not be confined to spheres that are relevant, but restricted, like animalism. In the plenary meeting of the 18th of December 2009 I pressed the Committee to include in the document some reflections, although quick, along these lines, but I was left pretty much isolated (something that obviously I don't mind at all, seen as, with regards to moral issues, the opinion of the majority is only a fact, certainly not an argument). This fact however, seemed pretty curious, seen as I did not propose to cut even a line from the text, but to simply integrate it. We know that experimentation on man is regulated by directives that are much more defensive and binding than animal testing, but we have reason to believe that, at least in some cases, there are experimental practices (e.g. on newborns, mentally ill patients, extremely elderly subjects) able to raise relevant ethical dilemmas on experimenters, dilemmas that deserve attention and are certainly similar to those that have been taken seriously in Law n° 413/1993.

Presidenza del Consiglio dei Ministri



**MINOR'S SEXUAL DIFFERENTIATION DISORDERS:
BIOETHICAL ASPECTS**

25th of February 2010

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PRESENTATION

In this Opinion the National Bioethics Committee deals with the pathologies – that can occur in children in different degrees of gravity and frequency – of “sexual ambiguity” (also called an “intersex” condition), that is, a not harmonious development of the different components of sex (genetic, gonadal, hormonal, phenotypic), where it is difficult for the doctors and parents to assign sex as male or female.

It is a delicate matter of considerable bioethical and bio-juridical interest as it places at the centre of reflection the sexual identity of the child (the different physical, mental and social components), the complex decisions of intervening on the body and psyche by the physician, the manner of providing advice for parents and the children themselves when they reach a sufficient level of awareness, the personal, social and legal implications for those affected by these pathologies.

The Opinion, after placing the problem within a historical and clinical framework, highlights the principle elements of international bioethical guidelines, in order to grasp the problematic issues in bioethical and juridical terms, and reach some important shared recommendations. Including: each medical intervention in DSD cases must have the objective to harmonise elements of disharmony in physical, psychological and social terms; the physician must pay particular attention on a diagnostic level to each objective sign (from the stage of prenatal development) to prearrange any possible therapeutic instrument; any intervention on the body must be guided by the principle of the best interests of the child, avoiding unnecessary mutilation (such intervention should be implemented only in emergencies, as it is preferable to wait until the individual reaches a maturity which allows the expression of consent); the family and the child himself/herself (if able to understand) should be given adequate psychological support and the communication must be careful and gradual, with the provision of appropriate counselling.

The NBC focuses in particular on the so-called “exceptional cases” where there are no objective indications for assigning sex: in these cases it is desirable that parents together with the physician make a shared choice to educate the child as male or female, however particular attention is paid to the emergence of spontaneous inclinations. Juridically, the NBC believes that the current Italian legislation governing the declaration of sex at birth (3rd November 2000) should be integrated with a confidential “annotation”, based on rigorous and comprehensive medical certification of the disorder that affects the newborn child, so as to subsequently consent – if necessary – correction of the registry indication through a more simplified procedure compared with that required by current law (that requires surgical medical treatment in accordance with the law on sexual rectification, the Law of 14th April 1982).

The document has been drawn up by the working group coordinated by Prof. Laura Palazzani: with contributions to the group made by Profs. Salvatore Amato, Carlo Flamigni, Francesco D’Agostino, Lorenzo d’Avack, Marianna Gensabella, Aldo Isidori, Assunta Morresi, Andrea Nicolussi, Maria Luisa Di Pietro, Giancarlo Umani Ronchi, Lucetta Scaraffia, Monica Toraldo di Francia, Grazia Zuffa. Special thanks to Prof. Maurizio P. Faggioni, for the two hearings held within the context of the working group and for his valuable suggestions in the drafting of the text. The Opinion was approved in the plenary session on the

25th February 2010 in unanimity of those present: Profs. Salvatore Amato, Luisella Battaglia, Adriano Bompiani, Francesco D'Agostino, Lorenzo d'Avack, Antonio Da Re, Maria Luisa Di Pietro, Riccardo Di Segni, Emma Fattorini, Carlo Flamigni, Marianna Gensabella, Laura Guidoni, Aldo Isidori, Luca Marini, Assunta Morresi, Demetrio Neri, Andrea Nicolussi, Laura Palazzani, Vittorio Possenti, Lucetta Scaraffia, Monica Toraldo di Francia , Giancarlo Umani Ronchi, Grazia Zuffa.

Among the absent members that have expressed their approval are Profs. Luisella Battaglia, Stefano Canestrari, Roberto Colombo, Bruno Dallapiccola, Romano Forleo, Silvio Garattini, Alberto Piazza, Rodolfo Proietti.

The President
Prof. Francesco Paolo Casavola

1. Definition

The term “disorders of sexual differentiation”(DSD from now on), refers to the inharmonious development of the different components of biological “sex” that can also influence the structuring of sexual identity and the assumption of gender role.

It is also known as sexual ambiguity or intersex¹⁰³. In the past different expressions have been used such as “androgynous” or “hermaphrodite”, to indicate those individuals with a mixture of both masculine and feminine elements present¹⁰⁴.

It is a particularly delicate matter of bioethical and juridical interest, as it puts at stake the health of the minor. The term “minor” indicates a person under the age of 18 and refers to a wide range of ages, including the infant, child, and adolescent: such temporal scope requires articulate bioethical reflection that takes into account the different ages, life situations and levels of awareness. The Opinion intends to highlight the issues of DSD connected with the gradual building of sexual identity, the complex decisions to intervene on the body and the psyche, the manner of informing and communicating between those involved (when possible, physician-parents-minor), the personal, social and juridical implications. Other issues arise in relation to anticipation of the diagnosis of certain pathologies of DSD in the prenatal stage which on one hand allows the possibility of new therapies in the uterus and on the other raise - in some cases- ethical issues in the context of the decision related to acceptance or termination of pregnancy. In this field adequate genetic counselling is particularly important¹⁰⁵.

The NBC, following along the child centred lines drawn from the previous document *Bioethics with Childhood* (1994), intends to propose ethical reflection which focuses on the dignity and interests of the child within the context of the complex issue under examination.

2. Sexual development

¹⁰³ Intersex and middlesex are terms used in English. Intersex is distinct from transsexualism, where the dissonance between biological sex- defined as male or female- and sexual identity recognises its genesis as primarily psychological.

¹⁰⁴ *Androgynous* indicates a being with both sexes present in some myths; *hermaphrodite* comes from the mythical Hermaphroditus, son of Hermes and Aphrodite, who obtained from the Gods the merging of his body with that of his beloved so becoming a hybrid, sharing male and female characteristics. As these expressions show, the subject, treated here as a bioethical issue in terms of certain medical disorders, also has an ancient and widespread history. A number of different myths represent androgyny as a “status of reality preceding creation and the ordering of the cosmos” (A. Di Nola, *Bisessualita' e androgynia*, in *Enciclopedia delle religioni*, Vallecchi, Florence 1970, vo. 1, col. 1144). The book of Genesis itself (1, 27), speaking of the creation of the first human being uses the expression “male and female he created them”, which could allude, as emphasised by the ancient exegesis, to a primordial androgyny. The ancientness of the subject and its symbolic radicalness add complexity to the scientific bioethical debate.

¹⁰⁵ Attention should be drawn to the Permanent Conference for relations between the State, Regions, and the autonomous Provinces of Trento and Bolzano: The agreement between the Minister of Health, the Regions, the autonomous Provinces of Trento and Bolzano on the document containing “Guidelines for the activities of Medical Genetics” 15th July 2004. This document advocates that genetic testing should always be accompanied by adequate genetic counselling.

Multiple factors contribute to sexual development. The three key factors are: 1. the chromosomes of the zygote (46,XX in females; 46,XY in males); 2. the differentiation of the gonads in ovary and testis; 3. the differentiation of organs responsible for reproduction and development of external genitalia.

The Y sex chromosome provides the signal for the development of the male gonad, irrespective of the number of female sex chromosomes (X chromosome) present. The absence of Y directs the development of the individual into a female. Therefore, the *genetic sex*, which is formed at the moment of conception in chromosomal 46,XX or 46,XY, can be considered the first event to determine the sex of a person. A series of changes follow on from this, in the cascade which leads to the formation of the female gonad (ovary) or male (testis) and therefore to the definition of the person's *gonadal sex*. Gonads, in turn, secrete hormones that control the development of external genitalia (*phenotypic sex*). There are also other levels of expression of somatic sexuality that contribute to the difference between men/women: for example, blood-chemical parameters and basal metabolism rate.

The *sex of rearing (nurture)* and *psychic sex (gender, role)* are dependent on these events.

Although the formula of sex chromosomes is already defined in the zygote, sexual differentiation in the human embryo starts only after the 6th week. Until then the gonads are identical in both sexes and both the precursors of the tubes and uterus are present, the so-called Mullerian ducts, as well as the precursors of the male efferent ducts, the so-called Wolffian ducts. Undifferentiated gonads appear as bulges in the central portion of the genital ridge. In the presence of testicular determining factor (TDF), 42 days after conception, the first signs of organisation of the testis appear. In the absence of TDF, the gonad develops into female.

Understanding of the initial stages of this complex process were defined in the 40's from animal castration experiments carried out by Jost. Following the removal of genital ridges in rabbit embryos, in the stage preceding differentiation of the gonad, it was seen that internal and external genitalia developed into female, regardless of genetic sex. When a crystal of testosterone (the male hormone produced by the testes) was inserted in place of the removed genital ridge, masculinisation of genitalia occurred even though the Mullerian ducts and therefore the uterus and tubes continued to exist. It has emerged from this result that the basic sex is female; virilisation is related to the secretion of testosterone by the testes; testosterone is not sufficient, however, to complete virilisation, the hormone that inhibits Mullerian structures (AMH) is also necessary.

Jost's intuition has been largely confirmed in the last 25 years, through a series of new acquisitions including, among other things: the identification of the SRY gene (*Sex determining Region Y*), the equivalent of TDF; the discovery of hormone AMH, produced by testis Sertoli cells, which inhibit Mullerian structures; evidence for the production of testosterone by Leydig cells of the testis and its reduction into Dihydrotestosterone (DHT), the hormone that produces virilisation in peripheral tissues, by the α -reductase enzyme. The effectiveness of these hormones depends on the functional integrity of the androgen receptor (AR gene) in target cells. This cascade of events is completed by the action of other genes present on non-sex chromosomes (autosomes) and on the X chromosome, whose proper functioning is critical to

obtain the correlation between chromosomal, gonadal and phenotypic sex as well as reproductive function.

The SRY gene is located on the short arm of the Y chromosome. Introduction of the homologue of this gene (SRX) in a female mouse embryo, determines the development into a male. SRY gene encodes a protein of 204 amino acids, which contains a sequence of 79 amino acids, evolutionarily conserved (HGM-box), present in proteins with high affinity for DNA. SRY is expressed in the genital ridges during differentiation and in many fetal tissues, but not in adult tissues. SRY binds to the promoter of the gene that encodes the anti-mullerian hormone (AMH) inducing expression and preventing the formation of derivatives of the duct of Muller. In addition it controls some enzymes involved in steroidogenesis and therefore in virilization and inhibits DAX1, a gene located on the X chromosome, which in turn acts as a repressor of sexual differentiation. The critical role of SRY in male sex determination is confirmed by the observation that its mutations cause sex reversal. People with this mutation have a chromosome 46,XY, but they are sterile females (Swyers syndrome). This condition arises not only from mutations in the coding or regulatory region of the SRY gene, but also, and more commonly, from loss of a part of the short arm of Y that contains the gene, deriving from an error during pairing of X and Y sex chromosomes in spermatogenesis.

The phenotypic sex of the embryo depends therefore on gonadal sex determination, which is primitively related to the complement of sex chromosomes and the presence/ absence of the Y chromosome. In humans the Y chromosome is the determinant in male sex. Indeed, in the presence of only one X chromosome (45,X or X monosomy), the phenotype is female and corresponds to Turner syndrome (gonadal dysgenesis with short stature; sterile female). Conversely, the sex complement XXY (47,XXY or Klinefelter's syndrome) and its more complex variant forms (48,XXX; 49,XXXXY) give rise to a predominantly male sterile phenotype. In the presence of a cellular mosaicism (coexistence of genetically different cell lines) 45,X /46,XY, the phenotype varies from sterile male (when the line XY prevails) to the Turner syndrome (ovarian dysgenesis with short stature when the X line prevails) with intermediate dysgenesis of the gonads and ambiguous genitalia.

The XY sex reversal (male to female) has a heterogeneous origin. An illustrative example is testicular feminization (known as Morris syndrome), in which the subject 46,XY, because of a mutation in the AR gene (androgen receptor) is insensitive to the action of testosterone, and despite having abdominal testis, develops a female phenotype, with dead-end vagina, in the absence of uterus and tubes. This condition can be associated to varying degrees of virilization, when there is only partial insensitivity to testosterone. Other aspects of ambiguity of the external genitalia in 46,XY subjects can be caused by a defect in the alpha-reductase enzyme, which transforms testosterone into the active form of dihydrotestosterone, which results in pseudovaginal perineoscrotal hypospadias, or other enzyme deficiencies in the cascade that leads to the synthesis of testosterone, such as the defect in 17-KS-reductase. In addition, three quarters of the 46,XY male carriers of alterations in the SOX9 autosomal gene have dysgenetic gonads and ambiguous genitalia, up to sexual reversion. Similarly, mutations with loss of function of the autosomal gene SF1 (*Steroidogenic Factor 1*), which regulates the transcription of certain target genes involved in reproduction, steroidogenesis and sexual differentiation in males, produce in subjects with

complement XY a female phenotype, with gonadal dysgenesis, uterus and normal Mullerian structures, adrenal hypoplasia.

XX reversion (from female to male) is very rare. The most common form is linked to translocation of the short arm of X of the region containing the *SRY* gene. Sex reversion independent from *SRY* (*SRY*-negative subjects) is exceptional and it is due to the mutation of certain autosomal genes.

Lastly, psychological sex, suffers from the influence of factors of a biological nature (brain imprinting) and also of an educational and relational nature.

3. DSD: classification and description of some clinical aspects

Genetic, gonadal and phenotypic sex– as already stated – are closely related and are defined by the genomic characteristics of the individual. It is implicit that such a complex mechanism such as sex determination and differentiation is subject, with relative frequency, to genetic mutations which result in variable aspects of ambiguity or dysfunction. From the physical point of view, the development of body size of sex organs comes from an undifferentiated structure, which then develops through factors of differentiation, the action of sex hormones and specific determinants encoded in the chromosomes: this process begins with fertilization and ends with puberty, with the development of secondary sexual characteristics. The project is originally set by genetic patrimony and is rich in interaction between the diverse components. If this process does not take place in a regular way, it can produce situations of disharmony in the development of sexual organs.¹⁰⁶

This state of disharmony between the genetic, gonadal, ductal and phenotypic components can raise important ethical issues for doctors, surgeons and parents at the moment of decision of the so-called “attribution of sex” or “sex assignment”, which sometimes requires intervention of physical modification and psychological support for the structuring of sexual identity.

The new classification of DSD distinguishes¹⁰⁷. 1. DSD from sex chromosome abnormalities; 2. DSD with 46,XY karyotype; 3. DSD with karyotype 46XX. The first group includes Klinefelter syndrome 47, XXY and variant forms; Turner syndrome with 45, XX and variant forms; mixed gonadal dysgeneses with 45, X/46, XY; chimeras 46XX/46XY formed from the fusion of two zygotes. The second group includes: disorders of gonadal development (testis); disturbance of synthesis, sensitivity and the action of androgens; other pathological aspects (e.g. the syndrome of persistent Mullerian ducts, etc.). The third group includes: gonadal developmental disorders (ovary); syndromes with excessive androgens; other pathological conditions (for example agenesis/Mullerian hypoplasia, etc).

The descriptions of some clinical situations of DSD mentioned in the previous paragraph in relation to their origin, follow as examples.

Among the most well known clinical situations of DSD abnormalities are: Klinefelter syndrome, Turner syndrome and mixed gonadal dysgeneses (previously mentioned in the paragraph above). According to other

¹⁰⁶ D. Frimberger, J.P. Gearhart, *Ambiguous genitalia and intersex*, “Urol. Int.”, 2005, 75, pp. 291-297.

¹⁰⁷ I.A. Hughes, *Disorders of sex development: a new definition and classification*, “Best Pract Res Clin Endocrinol Metab.”, 2008, 22 (1) pp. 119-134.

classification, Klinefelter syndrome and Turner syndrome fall under congenital primary hypogonadism with chromosome aberration¹⁰⁸.

The syndrome of Klinefelter is associated with karyotype 47,XXY, or more rarely with mosaic 46,XY/47,XXY. In patients with Klinefelter syndrome, testicular biopsy shows the presence of fibrous tissue with absence of spermatogenesis in more than 90% of cases. The phenotype is male with gynecomastia (abnormal development of the mammary gland), normal internal and external genitalia and underdeveloped testicles. The Klinefelter syndrome is generally associated with sterility, even if it is possible to produce a low percentage of sperm in 7% of cases.

Turner syndrome is characterised by 45,X chromosome (monosomy X, also known as 45,XO) or a mosaic (45,X/46,XX) or structural defects of the X (deletions, isochromosome of the long arm, ring chromosome). Those affected by the syndrome are phenotypically female, with dysgenetic ovaries, hypoplasia of the uterus and tubes, no pubertal maturation, menarche, do not produce female gametes and show hypoplasia of secondary sexual characteristics. External genitalia maintain a childlike appearance, stature is low, the chest is deformed; intellectual deficit is rare.

Mixed gonadal dysgeneses are associated with genetic mosaicism, abnormal gonadal tissue, ambiguity of the external genitalia, delayed puberty, primary amenorrhea in patients with female phenotype, increase in testicular cancer in patients with male phenotype. In gonadal dysgeneses, phenotypic characters and -particularly- development of the external genitalia are not usually discordant with the other components of sex, except for some forms of mixed gonadal dysgenesis.

In DSD with Karyotype 46,XY and 46,XX phenotypic sex can contrast variably with gonadal sex and the structuring of sexual identity may not correspond to the gonadal sex. While in the past “male pseudohermaphroditism” and “female pseudohermaphroditism” were distinguished, depending on the presence of male or female gonads, today a new classification, better adapted to the different clinical situations, has been proposed¹⁰⁹.

The DSD with karyotype 46,XY include - as previously stated - diverse clinical situations, characterised by incomplete or absent virilisation of external and internal genitalia in patients with karyotype 46,XY and male gonads. Among the various forms of DSD with 46,XY karyotype, we only need remember total peripheral androgen insensitivity and the 5 alpha-reductase deficiency.

Total peripheral androgen insensitivity is the so-called *syndrome of Morris*, a consequence of complete and impaired functioning of androgen receptors in the genital organs and peripheral tissues. Consequently, these individuals does not meet those transformations that are mediated by androgens in males, therefore they have a female phenotype with female external genitalia, dead-end vagina, agenesis of the uterus, internal genital ducts that are not differentiated, male gonads, usually held in the abdomen, inguinal canal or

¹⁰⁸ L.S. De Groot, S.L. Jameson, *Endocrinology*, IV edition, Saunders Co. 2001; *Klinefelter Syndrome*, Acts of the SIAMS commission for rare diseases, Padova February 2010.

¹⁰⁹ See: A. Dreger, C.Chase, A. Sousa et al., *Changing the nomenclature/taxonomy for intersex: A scientific and clinical rationale*, “Journal of Pediatric Endocrinology and Metabolism”, 2005, 18, pp. 729-733; C.Chase (ed.) *Chrysalis: “Journal of Transgressive Gender Identities”*, Fall/Winter, 1997; Cf. *Consensus statement on management of intersex disorders*, 2006.

labia. Menarche does not occur, the mammary gland develops normally¹¹⁰, pubic and axillary hair is absent. These people can not be virilised with hormone therapies. Treatment consists of removal of undescended testes to prevent the risk of cancerous degeneration of the gonads and the administration of estrogen. Expansion of the vagina permits a satisfactory sex life. The phenotypic sex and identity of these people is female¹¹¹. Not only the phenotype but also the level of muscle strength is similar to that of women, that is, to genetically female individuals: this implicates the importance of analogous treatment (consider the problem of possible discrimination in sports).

As previously stated, different forms of partial androgen resistance exist (Lubs syndrome, Rosewater syndrome, Reifenstein syndrome etc.): in these situations there is ambiguity of external genitalia at birth and partial masculinisation during puberty, with variable phenotypic changes.

The deficit of enzyme 5 alpha reductase (Imperato-McGinley syndrome) prevents the formation of an important derivative of testosterone, dehydrotestosterone, responsible for the evolution into male external genitalia (testosterone induces the development on male internal genitalia). These people are genetic males who present - at birth - ambiguous external genitalia with failure to close the lip and scrotal folds and agenesis of the scrotum. The internal genitalia, under the control of testosterone, evolve into male. Testes are usually undescended in the inguinal canal along with hypospadias and a small stretch of dead-end vagina. This phenotype often leads to allocation of female registry with correspondent female education. During puberty, in conjunction with increased levels of plasma testosterone, external genitalia progressively virilize, the volume of the penis increases, the testes descend and muscle mass grows: this transformation highlights the condition of DSD. The effects of physical transformation on identity are variable, but there is mostly a new male identification¹¹² as far as possible fertility in adult life.

Those DSD with karyotype 46,XX include different clinical situations, characterised by the presence of ambiguous external genitalia in patients with chromosome 46,XX. Among the forms of androgen excess there is hyperandrogenism from fetal defects in certain enzymes produced by adrenal 21-hydroxylase, 11-hydroxylase, 3-HSD, from maternal hyperandrogenism, iatrogenic (from progestins or androgens) or from virilising tumors of the ovary or the adrenal glands.

The most widespread form of DSD with Karyotype 46,XX with hyperandrogenism is congenital adrenal hyperplasia 21-hydroxylase enzyme deficiency involved in cortisol metabolism: this condition determines from prenatal life, an overproduction of androgens with consequent virilization of external genitalia. Alterations in development of genitalia are variable, from female phenotype with clitoral hypertrophy, to frankly male phenotype with

¹¹⁰ Cf. J.M. Morris, *Syndrome of testicular feminization in male pseudo-hermaphrodites* (82 cases). "American Journal of Obstetrics and Gynaecology", 1953, 95, pp. 1192-1211. This development is made possible with the action of estradiol, a typically female hormone produced in small quantities from the testes even in normal males and which – in this case – has a markedly feminizing effect because it is not thwarted by male hormones.

¹¹¹ A.B. Wisniewski, C.J. Migeon, H. F. Meyer-Bahlburg et al., *Complete androgen insensitivity syndrome: long-term medical, surgical and psychosexual outcome*, "The Journal of Clinical Endocrinology and Metabolism", 2000, 50, pp. 2664-2669.

¹¹² J. Imperato-McGinley et al., *Androgens and the evolution of male gender identity among male pseudo-hermaphrodites with 5 a-reductase deficiency*, "New England Journal of Medicine", 1979, 300, pp. 1233-1237.

complete fusion of the labia majora, which can simulate an empty scrotum, with marked clitoral hypertrophy, which looks like a hypospadiac or even normal penis, having sometimes a single meatus, urethral and vaginal, at the tip of the male genitalia. Usually, both the uterus and the tubes develop normally. The ovaries maintain for some time their functional potential and this explains the resumption of normal ovarian activity after appropriate therapy or, more rarely, spontaneously. The somatic aspect of patients varies according to virilization of external genitalia: from little or no virilisation in aspect, to a phenotype with masculine physique, that at puberty has short, muscular limbs, abundant hair apparatus, moustache and beard, no breast development, male fat distribution, low and husky voice. In cases of congenital adrenal hyperplasia deficit of 21-hydroxylase (genetic disease that can be suspected in a family where there have been previous cases and therefore also diagnosed prenatally¹¹³), administration of cortisone can be done even before birth, generally, with good results¹¹⁴, it is necessary, only in very serious cases, to resort to surgery to remove the clitoral hypertrophy or other aspects of virilization of the external genitalia, allowing a satisfactory sex life and avoiding the difficulties of the structuring of sexual identity linked to virilization. Some untreated or inadequately treated individuals, usually assume male sexual identity and find a discrete psychological equilibrium; often resorting to surgery to accentuate the manly appearance of external genitalia.

A specific form of DSD is ovo-testicular DSD, in which the (non functional) structures of the ovary and testis coexist. External genitalia may be ambiguous or differentiated as male or, more often, as female; development of the internal genital tract is constantly ambisexual and the uterus or uterine rudiment is usually present: this explains the observation of menstruation, which, in subjects with male phenotype appeared as cyclical hematuria. Secondary sexual characters of the opposite sex in a predominantly male or female soma may be present. Sex drive is usually low or absent; and sexual identity can be ambiguous¹¹⁵.

4. The problem of “assignment of sex”: a brief excursus

The identification of DSD has undergone modification according to changes in the way of considering sexual differences, the development of knowledge and biomedical technologies.

Sex was traditionally considered primarily a physical anthropological reality aimed at procreation: somatic data constituted the basic criterion for sex determination. The only possible way of facing the problem was that of social and univocal normalization to one sex, the one prevailing biologically. Only in cases of absolute ambiguity (so-called “perfect hermaphrodites”) was reference

¹¹³ Otherwise, it can be diagnosed at birth with a blood test of the newborn child.

¹¹⁴ M.G. Forest, H. Betuel, M. David, *Prenatal treatment in congenital adrenal hyperplasia due to 21-hydroxylase deficiency: up-date 88 of the French multicentric study*, “Endocr. Res.”, 1989, 15, pp. 277-301;

J. Travitz, D. L. Matzger, *Antenatal treatment for classic 21-hydroxylase forms of congenital adrenal hyperplasia and the issues*, “Genet. Med.”, 1999, 1, pp. 224-230

¹¹⁵ There are few long term studies. Among these: C. Elliott, *Why can't we go on as three?* “Hastings Center Report”, 1998, May-June, pp. 36-39; F.M. Siliper, S.L. Drop, J.C. Molenaar et al., *Long-term psychological evaluation of intersex children*, “Arch. Sex. Behav.”, 1998, 2 pp. 125-144.

made to subjective perception¹¹⁶. In the sixteenth century, with the birth of biological science¹¹⁷ more rigorous criteria for sexual identification were established in reference to the specific anatomy and physiology of male and female. For males the determining criterion was the presence of testes, and for females the detection of menstrual flow or the presence of the uterus¹¹⁸.

From the second half of the nineteenth century, physiological discoveries in the definition of sexual characters, lead to recognition of the gonads as the determining factor in the true sex of a person. Therefore, sex could be attributed without delay to the majority of individuals with ambiguous genitalia, possessing male or female gonads; only in extremely rare cases of true hermaphrodites (with gonadal tissues of both sexes) was “uncertain sex” properly referred to and the prevalent sex then sought. In this way, nineteenth century medicine managed to remove the inconvenience of sexual ambiguity and assign with certainty one of the two sexes to each individual¹¹⁹.

It was from the middle of the twentieth century that the criterion of genetic sex for sexual identification was introduced.

Today, in the light of recent developments in scientific knowledge and technologies, the framework of identification of DSD is highly composite. There is the realization that a person’s sexuality is not reducible to a single aspect, however relevant: sexuality has physical components (somatic, anatomical and physiological, gonadal and genetic) and psychological. Therefore, the “assignment of sex” for registration of birth and sexual identification in cases of DSD must take into consideration: a) *somatic indices* (phenotypic and gonadal sex): the appearance of the genitals is a determinant for birth registration, the possibility of a satisfying sex life and the mental elaboration of sexual self-identification; *gonadal sex* is relevant to brain *imprinting* (or brain sexualisation), hormonal processing and fertility; b) *psychological indices*, meaning personal identity and social role¹²⁰.

5. The treatment of DSD: bioethical and juridical reflection

Generally, in clinical practice there are two different situations that require cogitation and differentiated choices: early diagnosis (at birth or in the earliest years of life) or late diagnosis (in an adolescent child, but also in an adult subject), often in examinations to verify the delay or irregularity of sexual maturation (in adolescence) or the causes of infertility (in adulthood). The medical treatment of DSD on minors has undergone changes throughout

¹¹⁶ Ulpiano (D. 1, 5, 10) introduces the criterion of prevalent sex, evaluated on the basis of bodily appearance.

¹¹⁷ In addition to the canonical emphasis on medical report. For a systematic treatment of the issue in historical and theoretical terms in the context of canon law cf. P.A. d’Avack, *Cause di nullita’ e di divorzio nel diritto matrimoniale canonico*, Florence 1952, page 91 ff.

¹¹⁸ The role of the ovaries as agents of feminization was not understood let alone their ovum genetic function, and, in any case, they were not in the investigative possibilities of the medicine of that time: this explains the resorting to other indices of femininity.

¹¹⁹ On this point: A. Dromurat Dreger, *Hermaphrodites and the medical invention of sex*, Harvard University Press, Cambridge 1998.

¹²⁰ A. Isidori, *L’etica degli stati intersessuali*, in A.A. VV., *Androgen insensitivity syndrome (CAIS/PAIS)*, study day, meeting of the College of Schools specialising in Endocrinology and Metabolic Diseases of Rome, Fatebenefratelli Foundation, Rome, 23rd May 2009.

history¹²¹: if in the past children with this condition were not operated on, however since the 1950's medical practice has also begun to provide surgical intervention and has subsequently taken different directions.

5.1 In the 50's there was the spread of *the theories of J. Money* which had an impact in the development of the bioethical guidelines mentioned later in this opinion. Money affirms the irrelevance of genetic and gonadal sexual identity, in the belief that sexual identity (defined as "gender" to distinguish it from the bodily identity) derives from the psychic structure induced as a consequence by family education and socialization. In his opinion, the development of gender identity is a kind of "psychic imprinting" completed within two and a half years from birth and that can be changed later but with serious risks for psychological equilibrium¹²². Money's perspective marks a critical somatic step (or somatic prevalence) towards pragmatic criterion, that is, the criterion of sexual assignment by the physician on the basis of surgical feasibility: in cases of ambiguity, given the complexity of reconstruction of functional male genitalia, it was preferred to assign female sex to the subject, with a corresponding upbringing, regardless of consideration of the physical indices (but also of possible infertility or sexual satisfaction). Money's indication was therefore that of early assignment, in order to facilitate "oriented" *nurture*, even with intervention for demolition and reconstruction and possible hormonal therapy at pubertal age.

It should be mentioned that after World War II, the most discerning work in depth psychology - let us think to W.R. Bion or to D. Winnicott¹²³ - genuinely tried to understand the influence of the unconscious and cultural formation, without any denial of the genetic component in the construction of sexual identity. The model supported by Money was criticised¹²⁴ regarding the malleability of gender identity. Clinical and scientific evidence have challenged the model of absolute gender malleability. At the clinical level¹²⁵, the serious distress experienced by some of the cases treated (feminized males asked to

¹²¹ A.D. Dreger, *A history of intersexuality: from the age of gonads to the age of consent*, "J. Clin. Ethics", 1998, 9, pp. 345-349.

¹²² Cf. A.D. Dreger, *Ambiguous sex or ambivalent medicine? Ethical issues in the treatment of intersexuality*, "Hastings Center Report", 1998, May-June, pp. 24-35.

¹²³ D. Winnicott, *Playing and Reality* preface by R.Gaddini, Armando, Rome 1974 and *Sulla natura umana* edited by R. Gaddini, Cortina, Milan 1990; W.R.Bion, *The Italian Seminars*, Borla 1985 and *Attention and interpretation* Tavistok Publications, London 1970.

¹²⁴ Included in the criticism is the possible damage from surgical practice (loss of reproductive ability, infections, pain, distress, incontinence); the possible strengthening of the social perception of "sexual abnormality"; asymmetry in the treatment of male and female (the choice of assignment as male was measured on the basis of the possibility to have sexual satisfaction; the choice of assignment as female on the basis of the capability to copulate). K. Kipnis, M. Diamond, *Pediatric ethics and the surgical assignment of sex*, "The Journal of Clinical Ethics", 1998, 9, 4, pp. 398-410; H.G. Beh, M. Diamond, *An emerging ethical and medical dilemma: should physicians perform sex assignment surgery on infants with ambiguous genitalia?*, "Mich. J. Gender Law", 2000,, pp. 7-38.

¹²⁵ Reiner reported a study of 27 children: 25 males who were raised as females, 14 declared themselves to be male. W. Reiner, *To be male or female: that is the question*, "Arch. Pediatr. Adolescent Med", 1997, 151, p. 224; Id, *Case study: sex reassignment in a teenage girl*, "J. Am .Acad. Child. Adolesc. Psychiatry", 1992, 35 (6), pp. 799-803; Id. *Sex assignment in the neonate with intersex or inadequate genitalia*, "Am. J. Dis. Child", 1990, pp. 1044; Id, *Androgen exposure in utero and the development of male gender identity in genetic males reassigned at birth*, Presented at international Behavioural Development Symposium 2000, May 25-27, 2000; Id., *Gender identity: study questions `sex reassignment`*, "Health Med", May 16, 2000, A17.

be re-masculinized) has highlighted the problematic nature of sex assignment based on the adopted criteria¹²⁶. At the scientific level, the discovery of the importance of prenatal exposure to sex hormones not only for hypothalamic imprinting, but also for the psychic identification of the child show how not only external psychic factors (family, social and cultural) are determinants, but also biological factors play a role in the defining of body image. These findings show the problematicity of a sex assignment (resulting in surgical alteration of the body) be it consequence of an external decision, based on the medical criteria of surgical practicality¹²⁷ or on the subjective preference on the part of the parents¹²⁸. It therefore becomes apparent that there is the need to identify sexuality in a complex interaction between the somatic and psychic dimensions uniquely irreducible solely to the cultural-social factor (socio-cultural and environmental determinism).

However, Money's model has been taken up and valued as regards consideration of the need, following the diagnosis of DSD, of an early assignment, therefore rapid surgical intervention for medical and psycho-social reasons. This line is supported on the basis of the following considerations: a) living with sexual ambiguity involves psychic trauma, which renders individuals incapable of acquiring a harmonious sexual identity; b) living with sexual ambiguity implicates difficulty in acceptance on the part of parents and society. On the basis of prolonged psycho-pedagogical experience, Money's observation on the need for timely intervention in the assignment of sex, for a clear education right from the start (or as soon as possible). This line of thought pays special attention to the methods of communication, considering essential that the truth be learnt from the parents and children themselves, in a non-traumatic manner, and therefore with due caution¹²⁹.

5.2 The *guidelines* developed by M. Diamond and H. K. Sigmundson (1997)¹³⁰ distance themselves from Money and are presented as innovative.

¹²⁶ The case is well-known of two male twins, one of whom, John at 18 months of life, remained without genitals after a surgical accident. Money decided to feminize him (Joan) and suggested to the parents to bring the child up as a girl. But Joan always showed signs of distress; and at the age of 13 on discovery of the truth decided to resume male sex, and underwent multiple operations to eliminate the signs of feminisation. The alteration of psychic equilibrium brought him to commit suicide at the age of 38. Money publicised the case as empirical proof of his theory. In truth, it must be stated that the child was brought up as male up to 18 months of age, and was feminised only at a year and a half: therefore the distress would seem to confirm not so much the theory of malleability of gender, but rather the theory of the relevance of educational pressure early on in sexual identification. Cf. J. Colapinto, *As nature made him. The boy who was raised as a girl*, New York 2001. A critical review of the theory of Money is S.J. Kessler, *Lessons from the intersexed*, New Brunswick (NJ) 1998. There are other cases reported in literature cf. S.J. Bradley, G.D. Oliver, A.B. Chemick, K.J. Zucker, *Experiment of nurture: ablation penis at two months, sex reassignment at 7 months, and a psychosexual follow-up in young adulthood*, "Pediatrics", 1998, 102 (1), p.9

¹²⁷ M.L. Di Pietro, *Aspetti clinici, bioetici e medico-legali della gestione delle ambiguita' sessuali*, "Medicina e Morale", 2000, 50, pp. 51-83; B. Dallapiccola, *Genetica della determinazione sessuale*, "I quaderni di Scienza e Vita", 2007, 2, p. 11 and ff.

¹²⁸ Cf. K. Kipnis, M. Diamond, *Pediatrics, ethics and the surgical assignment of sex* cited.

¹²⁹ American Academy of Pediatrics Policy Statement, *Timing of elective surgery on the genitalia of male children with particular reference to risks, benefits, and psychological effects of surgery and anaesthesia*, 1996, 97, pp. 590-594.

¹³⁰ M. Diamond, H.K. Sigmundson, *Management of intersexuality. Guidelines for dealing with persons with ambiguous genitalia*, "Archives of Pediatrics and Adolescent Medicine", 1997, 151, pp. 1046-1050. Cf. of the same authors *Sex reassignment at birth: long-term review and clinical implications*, "Archives of Pediatrics and Adolescent Medicine", 1997, 151, page 298.

These guidelines seek to harmonise sexual identity with adult sex life and fertility, in an attempt to direct therapeutic treatment and education taking into account several factors in the choosing of sex: the dominant phenotype, karyotype, possible fertility, sexual functionality, the hormonal influence in the sexualisation of the brain (above all in males), considering it a criteria that has a substantial effect on the predictability of sexual identity. Careful diagnostic evaluation is recommended before and immediately after birth by pediatric endocrinologists, radiologists, and urologists to avoid delayed diagnosis; it is recommended that the choice of sex should be based on diagnosis, and not on the basis of sexual functionality or external appearance. The need for continuous family support (as for the individual) is indicated to ensure adequate and fair information calibrated to the capacity of comprehension¹³¹, allowing for approval of the choice to focus on the medical treatment objectively believed to be the most appropriate regardless of the desire for social “normalization” and the encouraging of acceptance; confidentiality as regards the family and respect of the patient’s body are recommended. Invasive treatments are not recommended for aesthetic reasons (to acquire normal appearance) but only for therapeutic. In rare and extreme cases where diagnosis is not possible and prediction uncertain, postponement of surgery is recommended, the choice of a name that can be used for males and females and an education which leaves room for spontaneous inclinations and free male or female expression, without forcing, until it is the actual individual (having reached sufficient cognitive and emotional awareness and maturity) who is involved in the decision concerning such delicate and crucial elements as personal identification as well as health. There is also the possibility that individuals may refuse surgery and accept their condition of coexistence of organic discrepancies between various sex components.

5.3 *The guidelines of the Intersex Society of North America (2006)*¹³² reaffirm the necessity of diagnostic criteria in sexual ambiguity and the importance along with somatic and functional indices also of identification of the genetic and endocrine factors in the prenatal stage¹³³; they consider medical and surgical intervention a duty only when faced with a real, present and imminent threat to the individual’s physical integrity and in the case of sure empirical indices or predictors, not forcing the patient to a social “normalization” (only in order to gratify the wishes of parents) that could cause damage (the emphasis on “normalization” induces a sense of guilt and shame in parents and a sense of rejection as regards the child). These guidelines recommend, in cases presenting no medical urgency, or objective elements to determine a decision, to delay surgery and postpone hormonal therapy to enable the individual to actively participate in the decision (wherever this may be possible, given the age of the individual), both in relation to the individual’s perception of sexual identity, and to the balancing of the risks and benefits of intervening. In

¹³¹ The guidelines insist on the need to avoid stigmatizing terms (such as: “abnormality”) in favour of a kindlier expression (e.g. “rarity”).

¹³² Intersex Society of North America (ISNA), *Clinical guidelines for the management of disorders for sex development in childhood*, Consortium on the Management of Disorders of sex development, 2006.

¹³³ W.G. Reiner, *Assignment of sex in neonates with ambiguous genitalia*, “Current Opinion in Pediatrics”, 1999, 11, pp. 363-365. Cf. also S. Kessler, *Lessons from the intersex*, cited; S. Creighton, C. Minton, *Post vaginal surgery in childhood should be deferred*, “Br. Med. J”, 2001, 323 pp. 1264-1265.

this sense the guidelines focusing on the “well-being of the patient” recommend the promotion of a welcoming approach towards the subject and the family who must be told the truth, avoiding every form of stigmatization (making use of appropriate, not objectifying terminology and avoiding photographs or an attitude of “curiosity”), ensuring adequate psychosocial support, through the formation of multidisciplinary teams able to deal with such cases, (consisting of paediatric endocrinologists, gynaecologists, urologists, geneticists, psychologists and psychiatrists, social workers and nurses). According to this perspective, it is not the surgical modification of the child (to conform to normal parameters) that can alleviate the anxiety of parents or favour social acceptance, but rather appropriate support and psychological and educational counselling, whatever the choice (male, female or - in extreme and rare cases – the preserving of the condition of ambiguity).

5.4 *The Consensus Statement on Management of Intersex Disorders* (2006)¹³⁴, while not completely abandoning the line inspired by Money, takes account of the non-malleability of sexual identity and the role of sexualization of the brain, and proposes the following indications: care when using nomenclature, to ensure scientific precision, comprehensibility by the subject (so as to find sufficient cognitive and emotional awareness) and the family, so avoiding confusion and stigma; the importance of a careful evaluation of the newborn in the diagnosis and pathogenesis (with reference to genetic data, to genital appearance for self-identification of the body, to the possibility of surgery, the maintenance of fertility and family views, as well as cultural circumstances); the formation of a multidisciplinary team able to address the situation. Early sex assignment is appropriate on the basis of a careful diagnostic evaluation that takes account of objective indicators, considering that each person should be assigned a sex in order to avoid the possible damage of an ambiguous education.

5.5 Along with these bioethical lines, it is important in bio-juridical terms to recall¹³⁵ the *decision of the Constitutional Court of Colombia* (1999)¹³⁶. The constitutional ruling recognizes that parents can give consent to treatment as long as it is guaranteed to be based only on the interests of the child and not on their own self-interest. To ensure this, it is necessary that informed consent is “qualified, clear, explicit and based on full recognition of the consequences of the treatment and alternative treatments” (with reference also to the possible postponement of intervention) and that it is “persistent” (in other words,

¹³⁴ P.A. Lee, C.P. Houk, Faisal Ahmed, A. Hughes, *Consensus statement on management of intersex disorders*, “Pediatrics”, 2006, pp. 488-500: document drawn up in the sphere of the International consensus Conference on Intersex , organised by Lawson Wilkins Pediatric Endocrine Society and the European Society for Paediatric Endocrinology.

¹³⁵ As well as the guidelines, it should be noted that the Consensus Conference on Intersex states (Chicago, 2005) and the International Meeting on Anomalies of Sex Differentiation (Rome, 2006) have drawn attention to the medical and legal problems, with particular reference to cases of professional negligence or consent, situations for now of little relevance in Italy and not under discussion in this Opinion. On the subject see R. Cecchi, G. Marrocco, *Stati Intersessuali e questioni medico-legali*, “Rivista Italiana di Medicina Legale”, 2009, 1, page 101 ff; J. Greenberg, *Legal aspects of gender assignment*, “The Endocrinologist”, 2003, 13,3, page.279.

¹³⁶ Sentencia SU-337/99, May 12th 1999, and T.551/00, Aug. 2nd 1999. Cf. also sentencia T-477/95 (www.isna.org/Colombia).

repeated over time) to guarantee the interests of the child (with appropriate psychological support)¹³⁷. Only medical intervention that is necessary can be carried out, namely, those interventions justified on the grounds of protection of the physical integrity and health of the child, also as regards the physical pain resulting from the burden of the operation and the associated risks: no operation can be carried out only for psychosocial reasons (emotional non-acceptance by parents of undefined sex; the parents' need for biological normalisation for social acceptance). For intervention for which there is no data on the benefits or the potential danger for the child (both physical and psychological) or that is irreversible, the consent of the actual subject is required (when informed consent must be gradual and based on the maturity of the child)¹³⁸. It is on this basis, therefore, that the constitutional ruling limits the capacity of physicians and parents to intervene surgically altering children with such pathologies, considering parental consent invalid if not motivated by the best interests of the child¹³⁹.

6. The bioethical recommendations of the NBC

6.1 The NBC underlines the delicate bioethical nature of the decisions in cases of sexual ambiguity in minors; there is at stake the issue of the basis of sexual differentiation and the structuring of sexual identity, as an essential element of the personal, individual and relational identity of each subject. The Committee believes it is important to give adequate consideration to each choice in this unusual situation, evaluating case by case, depending on "recognition" of sexual identity within the sphere of a global consideration of the subject, balancing in a dynamic synthesis the biological data (in the case of neonates) and the biological and psychological aspects (in the case of minors with a sufficient level of awareness), aimed at *harmonizing elements of disharmony*. The conception of sexuality as a structuring reality of a person within his/her uni-totality, the way of existing, of relating, of being in the world, prevents the use of *solely* physical and biological criterion, as well as it prevents from showing no regard for body size on sex in order to favour exclusively psychological components.

Harmonization derives from interaction between the biological and socio-cultural dimensions (as opposed to biological determinism on the one hand and socio-cultural determinism on the other), recognizing the importance of the biological component, but also external factors (psychological and environmental) - present during the stages of development of the minor that allow the achievement and expression of a sufficient level of awareness - , even without knowing to `what extent` and `how` they interact, from the well-established evidence that they do interact. Sexuality is not "neutral" at birth

¹³⁷ See also A.D. Dreger (ed.) *Intersex in the age of ethics*. Frederick (MD) 1999; S.E. Sytsma (ed.), *Ethics and Intersex*, Springer, New York 2006 (*International Library of Ethics, Law and the New Medicine*, vol.29); Intersex Society of North America (ISMA); S.E. Preves, *Intersex and Identity: the contested self*, Rutgers University Press, South Brunswick NJ 2003.

¹³⁸ The court bases itself on the studies of: A.D. Dreger, cited; J. Schober, M. Diamond; G.L. Warne, *Advances and challenges with intersex disorders*, "Reproduction, Fertility and Development", 1998, 10 (1), pp. 79-86.

¹³⁹ The first sentence considered not valid the informed consent of the parents for intervention on a two year old child because deeming it as not "qualified and persistent"; and in the second case of an eight year old child because already mature enough to decide

even if the boy or girl is at the start of the journey towards sexual identification: there are biological elements (genetic, gonadal, hormonal, and phenotypical) which are interwoven with environmental factors (social and family such as the parents' representation of the sexual identity of their son/daughter).

6.2 The NBC believes that the necessary steps must be taken to provide *accurate and early medical diagnosis* (if possible in the prenatal stage, otherwise during the immediate post-natal stage), of DSD through genetic testing, hormonal blood tests, attention to phenotypical characteristics. Early diagnosis should be accompanied by study of the causes of DSD in order to avoid them, where possible. It is recommended that physicians, harbouring diagnostic doubts at the moment of a birth, should clearly note these down in descriptive form in the medical records. In addition, physicians should be appropriately trained; in the meantime reference health facilities should be adapted, so as to prevent technical incompetence from being responsible for DSD.

In cases of prenatal diagnosis it is essential to implement all available and possible therapeutic interventions. In cases of early postnatal diagnosis, the NBC believes that the decision, of the physician together with the parents, to intervene or not to intervene (surgically and/or with hormonal therapy) should be guided – in the exclusive best interests of the child – by objective criteria (emerging from comprehensive diagnostic tests) without neglecting, when possible, extrinsic criteria (technical facility). Furthermore, the established importance of hormonal factors in the sexualisation of the brain as predictive elements of sexual identification is to be taken into account. The choice to intervene or not to intervene must be guided by the following criteria: therapeutic criteria and medical emergency, gradualness, the predictability of benefits and harm minimization (in the physical and mental sense) with a view to achieve, within a situation of organic pathology, the greatest possible harmony. Particularly those interventions that are irreversible or difficult to be reversed must have objective medical justification. The planning of medical and surgical interventions on the body, must have as an objective not only alteration of the somatic structure for “biological normalisation”, but also help the person to set the conditions to achieve, in the best possible way, self realization in physical and psychological harmony. These interventions are not only licit, but also a duty if they represent the only reasonable and possible path in order to ensure - as far as possible – that the person has the future conditions to reach harmonic identification, inclusive of the practice of future sexual activity. The presence of discordant sexual elements, if they do not conform to the plan of being male or female, makes their removal licit as they present a hindrance to realization, at least partially, of this harmony. There should be careful consideration of a balance between somatic indices (phenotypic sex or bodily appearance and gonadal sex in relation to fertility and to brain imprinting) and psychological indices (expected or present).

6.3 The NBC believes that such interventions necessarily require *informed consent*, arising from appropriate consultancy that provides comprehensive information to parents (respecting their emotionality) and to the minor (if able to

receive it). In particular, when the interventions involve demolition and are irreversible (or reversible with great reconstruction of the body)¹⁴⁰.

It is important within the sphere of consultancy that attention is given to definitions and nomenclature, and that unknown aspects (unknown to the parents or the actual subject, if in possession of sufficient awareness) are not revealed in a brutal manner so as to respect the complexity of the problem both in scientific and existential terms. The choice of the physician must be shared by the parents (responsible for later raising the child) and – as much as possible- by the minor itself, whose interests must be placed at the centre of ethical consideration.

The Convention on Human Rights and Biomedicine¹⁴¹ (1997) takes into account along with age and maturity, the minor's will. Even if formally the expression of will is for the parents, who have legal responsibility, the substantial consent of the minor – who is the central subject of therapeutic relationship – is to be sought and supported in the context of the complex relational dynamics, involving not only the parents but also the physician.

If the parents' choice, for some reason, did not meet clinical and diagnostic needs, or should they ask for intervention deemed "impossible", the parents' will could not be carried out because not in line with the "best interests" of the minor: it is the physician's undoubtedly delicate duty to make the parents understand the motives behind choices highlighting the biomedical and psycho-social aspects.

6.4 The NBC believes that in some *exceptionally difficult cases* (i.e. in cases in which there is no objective data for the assignment of sex¹⁴²), it may not be appropriate to proceed immediately to demolition and/or reconstructive surgery because this may not be compatible with the actual evolution of sexual identity. It is not always easy to explain the situation to parents and, above all, justify possible delays in the surgical definition of physical sex. However, surgical definition can not be dictated by "haste" in rectification of sex for individual preferences or social expectations. It is the physician's duty in advising parents to make them understand that in some extreme cases *watchful waiting* may be necessary (as dictated by the difficulty to establish a priori the degree of sexualisation of the brain and to predict the probability of acceptance of sex by the minor).

In cases of postponed intervention, the minor should also be gradually involved in the decision – according to the gaining of sufficient awareness – because, especially in the most difficult cases, the choice of the physician and parents may conflict with the sexual identity that is structuring. In these exceptional cases of genital ambiguity (when at birth objective data are not sufficient) the problem arises, for the parents, regarding the choice of upbringing. The NBC deems appropriate that it should be oriented towards

¹⁴⁰ In the case of disagreement between the parents, Italian law provides the possibility of recourse to a tutelary judge who will attribute the right to chose to the parent believed to be most capable of deciding for the good of the child.

¹⁴¹ *The Convention for the Protection of Human Rights and the Dignity of the Human Being with regard to the application of Biology and Medicine: Convention on Human Rights and Biomedicine* (Oviedo 4th April 1997): art. 6 c.2 "The opinion of the minor shall be taken into consideration as an increasingly determining factor in proportion to his or her age and degree of maturity".

¹⁴² For example, the rare cases of ovotesticular DSDs described above

male or female, with great attention to observation and spontaneous inclinations and to the gradual emergence of sexual awareness in the minor.

The NBC, faced with such complexity and problematicity, believes it is important that the decision regarding sex assignment should be shared by both parents and physicians and properly supported in psychological terms. Furthermore, it is also believed necessary that – when possible - the child should be heard and accompanied by adequate psychological support until post-pubertal time.

In cases where the subject has already developed a congruent sexual identity with the phenotypic sex that is the opposite of the genetic and gonadal sex and does not manifest the desire for sex correction, the information regarding the situation directed at the patient must be given with great caution as it could be destabilizing for mental balance¹⁴³. However, the truth must be told: a lie could only ruin the relationship of trust between the family and physician and could lead to the conviction of being affected by such a “repulsive” pathology even to avoid talk of it.

6.5 It is right to reflect, particularly on cases of genital ambiguity in which at birth objective data are not sufficient to attribute sex and on consequent legal formalization – in the short time as provided by Italian Law – of the declaration of birth¹⁴⁴. This involves cases in which there is a high possibility that the decisions taken may not reflect the dynamics of the psychological and physical development of the child and that may justify a subsequent request for change of sex at the registry office.

In the context of the bio-juridical debate the proposal was made to record at the registry office those children with uncertain attribution of sex *as such*, therefore avoiding their being registered as male or female¹⁴⁵. This hypothesis is unacceptable on the basis of certain arguments: firstly it would legally institutionalize, surreptitiously and not clearly, registration of a *tertium genus*, not legally recognised in our regulatory system and this would cause serious changes in its systemic balance; secondly this would give rise to, even if against all good intentions, real legal stigmatization of the person, with unpredictable psychological and social consequences, but undoubtedly highly risky; furthermore it is – regarding these disorders, anomalies and pathologies – a hypothesis just the opposite of specific sexual identity, that expresses a condition of uncertainty in assignment of sex and it makes no sense to build a third identity on uncertainty.

The NBC deems appropriate that the legislature should provide (compatibly with the principle of non-availability of civil status), at the time of official birth registration of the newborn as male or female, the possibility that

¹⁴³ E. G. Howe, *Intersexuality: What should care providers do now*, “J. Clin. Ethics”, 1998, 9, 4, pp. 334-337.

¹⁴⁴ In Italy the D.P.R. 3rd November 2000 No. 396 (art. 30) requires that the *declaration of birth* is made within 3 days after birth in the Directorate of Health of the hospital or nursing home where the birth took place or within 10 days at the Registry Office of the city where the child was born or the parents’ town of residence. In the declaration explicit indication is also required regarding the sex of the child (art. 29) and the name of the child must match the sex (art. 35). If the declaration is made after more than 10 days from birth (late declaration, art. 31), this is admissible by the registrar only if the declarant specifically indicates the “reasons for the delay”. The declarant must give reasons for the delay and this delay is reported to the Public Prosecutor. In cases of non declaration or late declaration without specifying the “reasons for delay”, the registrar reports to the Public Prosecutor to promote “rectification proceedings” (art.32).

¹⁴⁵ J. Butler, *Undoing gender*, Routledge, New York 2004.

the registrar records “an annotation”, based on rigorous and comprehensive medical certification, not of uncertain attribution of the sex of the newborn, but of the *pathology* itself. Such an annotation, confidential and strictly respectful of the privacy of the minor, could enable the competent magistrate, should a better and different clinical evaluation of the case be reached, to authorise upon request by the person concerned, a correction of the registry indication (due to incorrect attribution at birth), following more simplified procedures compared to those required by the law now in force¹⁴⁶.

7. Conclusions

Following on from this clinical, ethical and juridical reflection, the NBC recommends:

1. that where diagnosis is possible on the basis of objective and updated medical and clinical parameters, it must be recognized that it is the preeminent best interest of the child to be raised (in keeping with the diagnosis received) as a male or female;

2. that in cases of absolute genital ambiguity (where objective data are missing at birth), it is appropriate that the assignment of sex be agreed by parents and physicians and a consequent male or female education, along with the necessary psychological support and particular attention to the possible emergence of a sexual identity different from the one initially assigned;

3. that any possible surgical intervention will not cause unnecessary mutilation of the child, and as much as possible, not involve the loss of fertility potential and the conditions for possible satisfactory sexual activity; that thorough evaluation of the whole clinical situation is ensured by physicians, taking into account, but not bound by, the environmental, social and cultural factors;

4. that in the case of deferral of possible surgical intervention, waiting until the person is capable of expressing consent, adequate psychological support in the structuring of sexual identity will be given to the minor;

5. that when, in the context of ambiguity of sexual development, a discrepancy should arise between the assigned sex and the development of sexual identity, – after the required medical examinations and provision of

¹⁴⁶ For the cases of DSD described above correction at the registry office is more appropriate than rectification of sex, regulated by the Italian Law of 14th April 1982, No. 164, *Rules concerning rectification of sexual attribution*. This law does not explicitly distinguish cases of transsexualism and cases of DSD. In cases of DSD where it is difficult to assign sex with certainty at birth, and to which a male or female sexual identity is assigned nevertheless, it is essential to check over time the development of physical and psychological sexual identity (that can be congruous to that declared or may be opposed to what was declared at registration). The law demands the determining of phenotypic sex and congruency between phenotypic sex and the registered and social sex: in cases of DSD phenotypic sex can be defined during growth and may not need surgical treatment, if not for aesthetic or functional improvements. It is for this reason that it is appropriate, specifically in the case of DSD, to refer to registry correction (in cases of mis-assignment at birth), rather than the rectification of sex.

necessary psychological support - the change of sex at the registry office shall be facilitated legislatively;

6. that research in this field will be encouraged (for the furthering of knowledge into the causes of these pathologies and the therapeutic possibilities); that diagnosis of these pathologies will be carried out with scientific expertise and the provision of any possible therapeutic intervention, when necessary;

7. that seeing the importance of early diagnosis and treatment for the health of the minor, that observance of the principle of equity will be ensured in the accessing of the most advanced diagnostic methods and equipment, working to also overcome the qualitative differences between health facilities in the country;

8. that there will be special attention given to counselling and informed consent as regards the parents and the minor (if possible); - for this purpose – promotion of the training of health personnel able to, in addition to their scientific and technical competence, also focus specifically on the psychological dimension of the patient and the family;

9. that long-term studies will be encouraged with particular reference to complex clinical cases in order to identify additional elements that may give a contribution to the difficult decisions in this field.

Presidenza del Consiglio dei Ministri



ETHICS, SPORT AND DOPING

25th of March 2010

Introduction

The Opinion tackles the issue of doping after a synthetic general framing of it within sport ethics. Sport ethics includes a variety of concerns and it would benefit from an even more articulated reflection. This document is a first analysis, focusing specifically on doping.

After a preliminary definition of sport and an outline of the recent social developments of professionalization, the document highlights the fundamental values of this practical activity: the personal commitment to demonstrate the athlete's abilities and the fairness of the competition. Doping is a disvalue because it fraudulently alters these conditions: it allows achieving results even in the absence of an active commitment, it introduces an unjust and unfair advantage when the participants are on a level, as well as causing – through an unwarranted manipulation of the body – harm to the athlete's psychophysical health which also has negative social repercussions. The unacceptability of doping is a shared feeling in society, as it violates the fundamental rules of sport from an individual and a relational point of view, changing the meaning of sport, which becomes a pursue of success in itself.

The Committee examines the arguments of those who are in favour of liberalising doping, in order to verify their strength. However, even those who believe that autonomy is a value to safeguard in sport (at least to avoid the secrecy of this phenomenon, collect reliable epidemiological data, subject the athletes to medical checks when they are using doping substances), do not ethically accept doping, as it would cause "harm to others", leading to doping even those who did not make use of it, in order to avoid being excluded from the competition, increasing healthcare costs for society because of the damage to health that would inevitably arise, making sport meaningless also in the collective imagination.

The Opinion also tackles some specific problems that emerge in relation to pharmacological research with the use of substances that cure illnesses for non-therapeutic purposes, or the use of therapies in the absence of pathologies and cases where the athletes have a genetic constitution that introduces a factor of "natural" advantage in the competition. These are specific matters that are inherent to general bioethical problems regarding health and illness, the improvement and the possible applications of pharmacological research.

The NBC's final hope is for an increase of and an improvement in the control of doping and for a commitment in education, especially aimed at teenagers who are the most vulnerable subjects.

The document was drawn up by Prof. Aldo Isidori and Prof. Demetrio Neri, the working group's coordinators, with the collaboration of Prof. Lorenzo d'Avack, Prof. Carlo Flamigni, Prof. Laura Palazzani, Prof. Giancarlo Umani Ronchi. The document was approved unanimously by those present at the plenary meeting (Prof. Salvatore Amato, Prof. Luisella Battaglia, Prof. Adriano Bompiani, Prof. Roberto Colombo, Prof. Antonio Da Re, Prof. Bruno Dallapiccola, Prof. Francesco D'Agostino, Prof. Lorenzo d'Avack, Prof. Riccardo Di Segni, Prof. Emma Fattorini, Prof. Romano Forleo, Prof. Marianna Gensabella, Prof. Luca Marini, Prof. Assunta Morresi, Prof. Demetrio Neri, Prof. Andrea Nicolussi, Prof. Laura Palazzani, Prof. Vittorio Possenti, Prof. Monica Toraldo di Francia, Prof. Giancarlo Umani Ronchi) with the exception of Prof. Carlo Flamigni's abstention. Prof. Stefano Canestrari communicated his agreement.

The President
Prof. Francesco Paolo Casavola

1. Outline of sport ethics

1.1 The notion of sport

Amongst the various aspects of human life which applied ethics deals with, sport has not provoked the same level of attention and amount of studies as other subjects. There is certainly some literature dedicated to sport ethics and philosophy and there are specialised journals that tackle the psychological, sociological, medical, etc. facets of actively practicing sport, but we definitely cannot say that this is one of the most important issues under reflection in applied ethics¹⁴⁷. When it becomes a priority, is mostly because of events and situations that are considered a threat to sport ethics: in particular those linked to doping and to the enormous financial interests now associated with most of the world of sport, especially, but not exclusively, professional sport.

It's not even easy to elaborate an *unambiguous* definition of the term sport, in order to clearly identify what type of human activity is included in the term or not or, at least, in order to find the boundary between sport and other similar activities, e.g. physical activity practiced to "keep fit" or for fun: all sports are games, but not all games are sport.

In fact, sport is a delicate balance between at least three different activities: physical, fun and agonistic. It is easy to observe how psychophysical integrity is the essential component of the first two activities, but it can be seriously put into question by the third when competitiveness becomes violent (e.g. boxing), dangerous (e.g. motor racing), or it reaches such exasperations of competitiveness that it seeks a result at all costs (as in the case of doping). However, no matter how evident and emphasized these negative aspects are, competitiveness is an essential and unavoidable aspect of sport: it is often what makes a physical and psychological commitment enjoyable and acceptable, when it would otherwise be difficult to tolerate. It is in this framework that even the risks and dangers of sport, if consciously and voluntarily accepted, can be a fundamental element of individual autonomy.

We could therefore think of a descriptive representation in the form of concentric circles, in which the central area identifies the notion of sport as the conditions necessary and sufficient for it and a series of concentric circles moving away from the centre, as one or more of the sufficient conditions are weakened and other characteristics begin to prevail, up to the most external circles where it is not clear anymore if we are witnessing a sport or a performance or a game or something else. But even identifying its necessary and sufficient conditions is still the object of debate: sport has an agonistic and competitive component, which can appear in an institutional or non-institutional context and with a stronger or weaker emphasis whether it is a professional or an amateur sport.

For the aims of this introduction, it can be useful to talk about sport in terms of its "practical" notion, as defined by the philosopher Alasdair Macintyre, who took inspiration from sport (the example is American football) to construct this central notion in his idea of ethics: "Any coherent and complex form of socially established

¹⁴⁷ For a first approach cf. A Edgar, *Sport, Ethics of*, in *Encyclopaedia of Applied Ethics*, Academic Press, 1998, vol. 4 pp. 207-223.

cooperative human activity, through which *goods internal* to that form of activity are realised in the course of trying to achieve those standards of excellence which are appropriate to, and partially definitive of that form of activity”¹⁴⁸.

1.2. Sport and values

What values are inherent to sport? In general, the function of values is to organise, integrate and make our conduct coherent in its various aspects and, also, to give reasons, motives to our actions: values make the objects, persons or practices they are applied to more significant and for this reason they are respected and inspire “attachment”. In competitive activity they have particular importance because they are an indispensable element in creating good relationships between athletes, between athletes and associations (teams and federations), between sport overall and the public.

It is especially in light of competitive activity that values have been elaborated to represent a sort of common thread along which the various sporting disciplines rest, each one then emphasises this or that value according to its internal needs: fairness, recognition and respect for others, honesty, observance of the rules, friendship, overcoming distinctions and discriminations, etc. These values, although inherent to sport, as they qualify it by marking the distinctive qualities (virtues) of the sportsman, evidently can be appreciated also outside of sport. And we can add that one of the reasons for judging sport positively in relation to the qualities of social life is that those values and those traits find within it the right conditions to develop and become stronger.

1.3 The concept of fair play

There is a notion that seems to be at the heart of sport ethics, the notion of fair play. It is difficult to translate this term and often Italian regulations of sporting disciplines also prefer to report it in English. It is not easy even to give it an exhaustive definition: it indicates, as well as a value, a sort of fundamental mental attitude, the “right spirit” with which to practice sport. We gather this from the 1976 Declaration on Fair Play by the International Council of Sport and Physical Education, recognized by the International Olympic Committee (IOC), which characterised it as follows: a) honesty, truthfulness and a firm and dignified attitude towards those who do not play fair; b) respect for other team members; c) respect for the adversaries, both when they win and when they lose, in the awareness that the adversary is a partner necessary to the sport; d) respect for the referees, shown through an effective effort of collaboration with them.

A more analytical explanation of these characteristics can be found in the Sport Ethics Code published in 1993 by the Council of Europe. It says that fair play must be intended not only like the right way of behaving, but also as “a way of thinking”, the characteristics of which are of an interest not only in sport, but they also enrich society overall. For this reason it is in society’s interest to protect the

¹⁴⁸ A MacIntyre, *After Virtue. A Study in Moral Theory*. Duckworth, London, 1981.

values inherent to fair play against all those external pressures that can translate in attacks against the essence of sport. And – as often happens for indeterminate concepts, which are easier to define negatively – the Council of Europe synthesises in the following terms those behaviours that are contrary to fair play and the external pressures that can have the effect of giving them a boost: cheating, tricks at the limit of legality (gamesmanship), doping, violence (physical and verbal), exploitation, inequality of opportunity, excessive commercialisation, corruption. To the list of destabilising external factors we could also add sports information (or at least part of it), with its daily effect of boosting a morbid collective fascination that involves and induces excitement, an often fanatical and always stressful exaltation: all the opposite of the notion of sport itself that, in its general meaning, refers to the fun, enjoyment, relaxation and recreation of those practicing sport and those watching the sporting event.

1.4. The professionalization of sport

Going back to the list formulated by the Council of Europe, it is not possible here to fully analyse the significance and the importance of the negative behaviours and factors that affect fair play: we would also risk fragmenting sporting practices into various subsystems, according to how those factors play out within them (we must think, for example, to the different importance of the “physical violence” aspect in sports that do not involve physical contact as opposed to those that do, like football, especially American football, ice hockey, not to mention boxing). It is necessary however to focus, in this introduction, on one of the factors that in the Council of Europe’s list is called “excessive commercialisation”, linked especially to professional sports, but that today is one of the main factors of erosion of sport’s intrinsic values, also because of the retroactive effect that professional models have on general sporting activity, especially for teenagers. With regards to this, we must remember that the Olympic movement was born, at the end of the 1800s, as a reaction to the beginning of the process of the professionalization of sport, which, from England, was starting to expand irreversibly: and many think that in that process (which transforms play into work) is the root of the dynamic that, almost inadvertently at the beginning, but exponentially in the second half of the 20th century, linked sport to considerations that previously, even though never completely absent, had little importance: politics, mass media, research and finally, most of all, economical interests¹⁴⁹. It is a complex problem, the discussion of which goes beyond the limits of this document. Here we simply highlight two important points. The first is that the process of professionalization and expansion of sport goes together with the creation of sporting regulations, as a derivation of the organised exercise of some sporting activities cultivated by the ruling class and then taken on also by middle and working classes. “Modern sport” goes from “limited programme” competitiveness, to an “unlimited programme” competitiveness, in the sense that the ideal duration of the game become unlimited and, consequently, the

¹⁴⁹ Cf., on this point, S. Rizzo, *Bioetica e sport. Nuovi principi per combattere il doping*, Il vascello ed., Cassino, 2006, pp. 30-38.

organisational structures of play had to be modified, perfected and integrated in order to make them suitable to their new tasks. Therefore a profound organisational transformation takes place, which leads to issuing regulations with regards to the more rational and profitable ways to executing exercises and competitions.

We must not overlook the fact that another characteristic and foundation of unlimited programme competitiveness is the relevance and the progress, also unlimited, of sporting results. The results must be evaluated in space and time, therefore it becomes necessary to have written rules in order to avoid the risk of variations that would make the result non-comparable, which instead must be checked, used and filed for any possible comparison. And it is the principle of the “record” in sport, with the need to establish general rules, which leads to the creation of national and international bodies drawing up and perfecting the rules in order to increase guarantee and control.

In Italy, interventions in this sector were set up in Law No.401/1989 (“Interventi nel settore del gioco e delle scommesse clandestine e tutela della correttezza nello svolgimento delle competizioni agonistiche” and Law No. 376/2000 (“Disciplina della tutela sanitaria delle attività sportive e della lotta contro il doping”), which takes up again and renews the previous Law No. 1099/71 (“Tutela sanitaria delle attività sportive”). Generally the reason for intervening with a law has to be found in the expectation of “fairness” surrounding the sporting event framed promotionally. Public intervention in sporting activities is aimed at strengthening their social-pedagogic value, which is lacking if the agonistic activity is not carried out with honesty and fairness. “Each participant or spectator of a competition carried out under the aegis of a public organisation legitimately expects that it will happen perfectly in line with sport ethics rules”¹⁵⁰.

The second important point is that the interests linked to professionalization have now taken hold also in the Olympic movement, eroding, at least in part, its original spirit. No scandal, certainly: after all, like any human activity, sport is also affected by historical changes and social evolution, and certain behavioural patterns, which could apply to sport at the beginning of the 1900s (when, for example, even employing a coach to improve performance was stigmatised), cannot be considered valid today and therefore must be reformulated to keep up with the times. It is not possible to compete at certain levels training two or three times a week in the local gym: but if the formative years are dedicated to sport, someone will have to think about providing a future free of worries for the athlete. Naturally, the big national and international sporting organisations are aware that it is impossible to go back to the “romantic” phase of sport and the adjective “excessive” together with “commercialisation” immediately clarifies that the Council of Europe and the IOC have accepted the idea (which however would have scandalised Baron De Coubertin) that the involvement of financial interests in sport is not to be judged completely negatively. We can agree on this: we cannot oppose the changes only because they are changes, we must assess their impact on sport and there is no doubt that commercialisation has supported the

¹⁵⁰ T. Padovani, *Law 13.12.1989 No. 401 (G.U. 18.12.1989, n. 294), Interventi nel settore del giuoco e delle scommesse clandestini e tutela della correttezza nello svolgimento di competizioni agonistiche*, in “Legislazione penale”, 1990, p. 92.

development of sport, even when not directly involved in the phenomenon of commercialisation. Therefore commercialisation is (or has become) a condition of sport, which can lead to wrong behaviours, but is not wrong in itself or, in any case, it would be illusory to think of eliminating it. But if this is true, then the problem seems to be about boundaries rather than principles: we can be firm about the principles, asking what the limit is beyond which the principles are violated. When does commercialisation become “excessive”? Where is the limit? Maybe we could push beyond the analysis and think that it is not even a question of quantitative limits, which are difficult to pinpoint, but rather an issue of how commercialisation, excessive or not, affects the intrinsic value of fair play: an athlete who informs his/her own sporting life and behaviour on fair play principles, and then even obtains a financial prize for his/her victory, does not violate any sport ethics principles.

1.5. Winning at any cost?

According to some analyses, however, the advent of commercialisation in the world of sport has acted as a flywheel for the spreading of a mentality aimed at emphasising the agonistic aspect over the fun aspect, and allowing “winning at any cost” to prevail over “the important thing is to participate”: as an American football coach declared, “winning is not the most important thing, it is the only thing that counts”. In this type of competition, according to some pessimistic but very realistic analyses, it becomes rather illusory to think of winning the battle against the spreading of doping only with repressive or “educational” instruments, and being unable or unwilling to tackle the roots of the problem: the mentality focused on winning at any cost, overcoming the limits, achieving a record, undoubtedly supported by the financial interests of the world of sport and also – in connection to them – by what the fans expect (also because of television) from sporting events.

We can also reasonably presume that the link between that mentality and the growing economic interests will intensify, in the near future, moral problems in sport, motivating the research of new methods of manipulation aimed at satisfying the principle which seems to dominate today’s sporting practice: overcoming limits, which – we have seen – seems to be the original sin of modern sport, at least of agonistic and competitive sport. In this context, we must not underestimate the fact that the development of biomedical research and the identification of the genes involved in controlling an increasing number of physiological processes, could put at our disposal new ways of intervening on human physiology. This is the so-called genetic doping, which uses for non-therapeutic purposes the transfer methods used for somatic gene therapy. Genetic doping has officially become part of the WADA (World Anti-Doping Agency) Anti-doping Code following the Copenhagen congress in March 2003 and since then WADA started research programmes aimed at identifying methodologies suitable to discovering the eventual use of this methodology¹⁵¹.

¹⁵¹ A lot of uncertainty still surrounds the effective practicability of this form of doping. We must in fact remember that, in the current state of knowledge, the use of gene transfers in somatic gene

2. Doping

2.1 Definitions

The etymology of the term presumably comes from “dop”, an alcoholic substance taken by Zulu warriors to incite them before battle. From this the term “doping” which, at least in the sense it is used in the sporting world, means (in concise terms) “the improper use of substances or methods aimed at artificially improving physical performance by increasing muscular mass or resistance to fatigue”. In 2000 Law No. 376 (“Disciplina della tutela sanitaria delle attività sportive e della lotta contro il doping”) extended this formulation to “drugs, substances and practices aimed at changing the organism’s psychophysical or biological conditions in order to alter the athlete’s agonistic performance” (art. 1); where the term “alter” means both an “improvement as well as a worsening of the sporting performance due to the use of ergonomic or ergogenic doping substances and ergolytic doping substances; where the reference to the individual’s biological condition demonstrates a preventive rigour with regards to the athlete’s integrity through any kind of anatomic-functional perturbation, although not apt to displaying the noteworthy characteristics of psychophysical changes”¹⁵².

The same Law (Art. 2) compares doping: “to the fraudulent behaviour aimed at changing the results of the checks on the use of drugs, substances and practices” instead of only selectively modifying agonistic performance, an extension can be now found in the Code issued in 2003 by the WADA (World Anti-Doping Agency), which is better to quote in full:

“Doping is the presence in the athlete’s body of a prohibited substance, its metabolites and “markers”, therefore it is each athlete’s personal duty to ensure that no prohibited substance enters his/her organism. Athletes are responsible for any prohibited substance found to be present in his/her body.

Doping is the use or attempted use of a prohibited substance or a prohibited method.

therapy programmes (started at the beginning of the 1990s) has not yet given the results that were hoped for and, at times, it has been followed by very serious negative events, which led to the suspension of these programmes. Even more uncertainty exists with regards to instruments capable of ascertaining the eventual use of this methodology for doping purposes. The point on these research programmes was made during the “Gene Doping Symposium” organised by the WADA in Saint Petersburg in June 2008: cf. site www.WADA-ama.org for further information on this topic.

¹⁵² E. Capodacqua in: *Doping Antidoping*, edited by S.D. Ferrara, Piccin, 2004. The classes of substances forbidden in Italy by Ministerial Decree 15-X-02 (G.U. 278 of 27 November 2002; Supplement 217) are the following: stimulants, narcotics, anabolic steroids, diuretics, peptide hormones, local anaesthetics, alcohol, derivatives of cannabis sativa and cannabis indica, glycol-corticosteroids, beta-blockers. With the subsequent Ministerial Decree of the 30th-XII-02 (G.U. 64 of 18 March 2003) this list is integrated with forbidden medical practices: haematic doping (amongst which CERA, long acting Epo), methods of artificially increasing Red Blood Cell mass, oxygen transporters, haemoglobin allosteric modifiers, substances that artificially modify PH and/or the overall quantity of blood, sample’s manipulation to alter its integrity, use of substances that alter the sample’s composition and concentration, myostatin inhibitors and finally genetic doping, which we mentioned.

Doping is refusing, or failing without compelling justification, to submit to sample collection, after notification, as authorised in applicable anti-doping rules; or otherwise evading sample collection.

Doping is the violation of applicable requirements regarding athlete availability for out-of-competition testing, including failure to provide required whereabouts information and “missed” tests which are declared based on reasonable rules.

Doping is tampering, or attempting to tamper, with any part of doping control.

Doping is the possession of prohibited substances and methods.

Doping is trafficking in any prohibited substance or prohibited method.

Doping is the administration or attempted administration of a prohibited substance or prohibited method to any athlete; assisting, encouraging, aiding, abetting, covering up or any other type of complicity involving an anti-doping rule violation.”

As we can see, this broad formulation included in the Anti-Doping Code also ratified in Italy, goes well beyond the previous definitions which sanctioned only illicit behaviour in sport: in fact it invests aspects (for example refusing or avoiding checks or not being available for out-of-competition testing) that have more general ethical and legal implications and involves all the varied world of the “aspects” surrounding the athlete, and that are so precisely involved in the illicit behaviour¹⁵³.

2.2. Historical outline

The history of the “little help” given to athletes, or autonomously taken by them to improve their sporting or athletic performance, is as old as the history of sport; even if at the beginning, as the prize for the athlete was a crown of laurels but especially his/her almost divinisation, the methods to achieve this result were not judged negatively.

The Egyptians and then the Greeks used herbal infusions or diets rich in sugar. As did Roman gladiators fighting in the arenas.

But we must look at the time of modern Olympics for the fraudulent use, (even if there was no specific regulation or effective control about this matter), of substances with a precise pharmacological stimulant (caffeine, strychnine, etc) or analgesic (cocaine, alcohol, etc.) effect. Up until the arrival, in pharmacology, of amphetamines, widely used in the second world war as stimulants and anti-tiredness by the soldiers. It was a lesson immediately learnt by the athletes, especially cyclists, amongst whom the first deaths due to the use of stimulants were recorded.

However, the newest fact was the arrival of anabolic steroids, difficult to detect, especially if taken away from the competition, and devoid of dramatic acute effects, even if the long term harmful effects are known. Subsequently, great emphasis has been given to the human growth hormone (hGH), that can be found

¹⁵³ On the complexity of the phenomenon and the various aspects that intervene cf. European Group on Ethics in Science and New Technology, *Ethical aspects arising from doping in sport*, 11th of November 1999.

in unlimited quantities with recombining methods and it is difficult to detect in the blood and/or urine if not in very indirect ways. Last but not least, the use of drugs capable of increasing the Red Blood Cell mass and therefore the intake of oxygen (Epo: synthetic erythropoietin), also vary difficult to detect because the parameter of judgement (the hematocrit value), undergoes considerable personal, ethnical and environmental variations. Of this type are also the so-called oxygen “transporters” (synthetic haemoglobin, haemoglobin allosteric modifiers, etc.), and other substances mentioned above.

2.3 Investigations and numbers

We must first of all clarify that all reported statistics and percentages represent probably the “tip of the iceberg”, as they have been gathered in “official” settings (sporting and non), so that the great majority of the data that could presumably be obtained in non-official settings escaped being gathered (amateur gyms, “body-building” gyms, etc.). In fact, as it is often found, the secretive characteristics of this phenomenon hinder the implementation of epidemiologic investigations, which are still lacking today. Anti-doping tests carried out in IOC laboratories supply insufficient data for a statistical extrapolation and the accurate estimate of the phenomenon, because of the small number of athletes tested (130,000 according to the 2008 Wada Report; about 10,000 a year in Italy according to Coni) and of the imprecision of research methods. The low statistical significance is therefore due to the small sampling of the tests carried out, faced with the tens of millions of athletes dedicated to sporting practices even outside of the competitive pinnacles.¹⁵⁴ The percentage of the positive data is only apparently low (about 2% and therefore about 200 positive cases a year, according to Coni) because, as we have said, the significant data is invalidated by the low number of checks: in effect, if this data matched reality, we could not even talk of an emergency¹⁵⁵.

The athletes’ assessment of the phenomenon is also surprising. In a dated but significant survey carried out in Italy on 1015 athletes and 206 coaches, masseurs and sport’s doctors, 30% of the athletes and 21% of the doctors was in favour of doping. About 10% of the athletes admitted using amphetamines and anabolic steroids, 7% “blood doping”, 2% using beta-blockers. 62% (maybe the most worrying data) said to have been subjected to “pressure”; more than 70% said to have easy access to illegal substances, but 82% was in favour of more control.¹⁵⁶

¹⁵⁴ S.A. Ferrara, *op. cit.*

¹⁵⁵ To give an example of the little reliability of statistical data, an (out of competition) survey carried out by IOC in 2008 on 2000 blood and urine samples, published by WADA, reported a positive result on 41 cases, that is, 82%! (WADA, 2008 Annual Report). Such a discrepancy could be explained away with the hypothesis of a “cure” with doping agents during resting or training periods, to be opportunely suspended before the competition so that the athlete will come out “clean” in an eventual check. But these numbers are undoubtedly too small for a significant assessment.

¹⁵⁶ V. Scarpino et al., “Lancet”, 1990, 332, 1084, pp. 18-19.

Much more dramatic the size of the phenomenon, for example, in the USA, where doping practices are reported for the 2-3% of non-athletes (2,7 amongst 10 and 13 years old), 5-11% in high school athletes, 17-20% in University athletes and up to 70% in professional athletes (of which 30-40% female). In addition, in a survey carried out at the Università del Veneto, some teenagers said that they would be prepared to die of the effects of doping in order to achieve a sporting success.

With regards to this, particularly dramatic is the problem of doping in teenagers, often deceived with the false tale of “integrators”, which hide doping. Can a teenager have the serenity of judgement, the psychological maturity and the moral strength to resist the pressure that, at various levels and in different ways, comes from coaches, Sports Organisations, and often also families? Probably not, and this is maybe the most painful aspect of teenage doping, which burdens of further negative responsibility the hidden persuaders, who are responsible for a great harm, as well as physical (arrest of growth and sexual development), to young people’s civil and moral conscience, who are “educated” to deceit, disloyalty and the negation of sport’s ethically positive values¹⁵⁷.

Young people approaching sport not only have the right to be informed about the physical risks of taking illegal substances, but also to be educated to the ethical values of sport mentioned above, which can be summarised in the fundamental value of respecting your own body and other people’s rights. A 1994 European Union directive (94/33 CE), aimed at the protection of under-age work, mentions in Article 5 “cultural and similar activities”, amongst which sporting activities for children and teenagers. According to this directive, Member States must lay down authorisation procedures for the introduction of young people to the abovementioned activities. These procedures must respect the following conditions: the activities must not be harmful to: 1) the safety, health and development of young people, 2) their attendance at school or their participation in vocational guidance and training programmes. As this is the situation and also taken into account the protection that national laws and international conventions give to the correct psychophysical development of minors, it is evident that the administration of doping substances of any kind is a “violence” that can lead to both penal and civil prosecution for parents and third parties.

In past years, formative-educational interventions were promoted with regards to professional and amateur sport (see campaigns “I don’t risk my life” and “My life first of all” promoted in Italy by CONI through the Anti-doping Scientific Commission), interventions that however appear to be lacking in those environments where the phenomenon of doping is more dramatic, that is, “fitness” and “body building” gyms. In fact, in these environments, although generally the element of cheating in sport is missing, other particularly negative aspects come into play. First of all, the incredible quantity of the drugs – anabolic steroids and others – used in dosages that appear exaggerated even in zootechnics (from which often dosages and preparations are taken) and that therefore cause serious and permanent damages to health. Secondly, the reason for pharmacological interventions, which have purely “hedonistic” motivations (and often also financial

¹⁵⁷ Cf. P. Binetti, *Doping e psicologia adolescenziale*, in *Bioetica e società*, edited by S. Fanuele, Laterza, Bari, 2004, p. 209 ff.

outcomes), can be devoid of the “promotional” aspects (not to mention coercive) that could be “attenuating” factors certainly not from an ethical point of view, but with regards to any repressive measures. Last, but not least, the abovementioned scarcity of the checks, capable of generating a kind of conviction of impunity.

3. Ethical considerations

3.1 Complexity of the phenomenon

In the ethical evaluation of the doping phenomenon more general issues come in to play, from the question about the boundaries for the “manipulation” of the body to the controversy between “nature” and “nurture”, from the distinction between “recuperate” and “improve” the normal functioning of the organism (which involves the latent ambiguities in the concept of illness) to the value of biomedical and pharmacological research when applied to the world of sport, etc. In this document these general themes, about which, as known, there are very different views, will not be tackled in detail, even though, obviously, during this exposition we will touch upon how the different views on these more general themes have affected the ethical evaluation of the phenomenon. We will start here with the observation that the moral unacceptability of doping is widely recognised and we will discuss whether the reasons at the basis of this point of view can counter the reasons put forward by those who suggest different evaluations, who sometimes even ask for some kind of liberalisation of doping. Before entering into this discussion, it is useful to look at some issues that can highlight the complexity of the phenomenon.

The first point we must make is that the use of performance enhancing substances or methods happens also outside of institutionalised agonistic sporting practices (professional and non) and invests also amateur sporting practices or the exercise practiced in gyms to “keep fit” or improve physical appearance¹⁵⁸. Although it is contradictory that people dedicated to an activity which is aimed mostly (if not solely) at keeping in good health, take substances that can in effect be harmful to health, it is a fact that the spreading of forms of doping goes beyond competitive sporting practices and, probably, it must be linked to more general psychological and social dynamics (the speeding up of life in post-industrial societies, the anxiety it generates of not being able to match the performance required in the models offered by the mass media, etc.) which are reflected, for example, in the growing use of drugs to enhance work performance or the use of drugs simply to “enjoy” free time: some athletes who turned out positive to cocaine admitted to having used it only to “keep up” and be able to go to the disco after the sporting event. These are undoubtedly important aspects in the general framework

¹⁵⁸ It makes us think, for example, the data emerged a few years ago from a study by the European Union on 23,000 sport’s centres in Belgium, Portugal, Italy and Germany, frequented by about 16 million people: 6% was regularly taking performance enhancing drugs. And we must observe that this percentage is even higher than the 1.72% of athletes using doping, which is what sporting organisations continue to declare.

in which we must put the phenomenon of doping, but their analysis goes beyond the aims of this document.

3.2 Doping and pharmacological research

The second point regards the link between doping and pharmacological research. As it is clear from the list reported in paragraph 2.1, that the majority of the systems and substances (and their antidotes) used in doping practices come from pharmacological research and, generally, are primarily applied to curing human illnesses. Obviously, no-one doubts that pharmacological research is in itself positive, but – as recent news also shows us – there are laboratories solely and exclusively dedicated to the application of biomedical research to doping practices. An example¹⁵⁹ often cited is that of the research by H. Lee Sweeney on IGF-1 to combat muscular dystrophy, from which comes the Nadia Rosenthal's "Schwarzenegger mouse": the first to take an interest in this research – revealed Sweeney – were coaches and athletes, and the WADA immediately vetoed the eventual use of the IGF gene transfer. No-one however would dream of judging Sweeney's research negatively because of the use that it has been attempted to make of it.

We must however add that not always the abuse of therapeutic innovations needs organisations and laboratories dedicated to it. An example can be the administration (off labels, as they say) of legal drugs, not included in the list of prohibited substances, but in the absence of a specific pathologic need: for the only purpose, for example, of allowing the athlete to face sporting commitments that are near in time (because of the foolish, for purely commercial reasons, intensification of the sporting events' calendar) and that do not consent a physiological recuperation from fatigue. It is not fully considered doping (although, thanks to it, there is an advantage): but the recent invention of the expression "almost ill" to justify the administration, by some football teams' sports doctors, of a wide variety of drugs (especially anti-inflammatory and painkillers) to professional athletes raises some doubts, at least with regards to the truth of the statement that sport is good for your health. Naturally, in the background there is the controversy about the possibility of tracing a line to divide therapeutic and non-therapeutic use, but the athletes' use of drugs focuses attention on another situation. As we have seen from the broad definition of doping elaborated by the WADA, this also involves taking substances that mask, and sometimes do not allow the discovery, of the presence of doping agents. Now, it is a fact that these substances often appear amongst drugs of widespread use and, as athletes can also be afflicted by various pathologies, rules that are too rigid risk affecting their right to health. In these cases sporting authorities prescribe that an athlete who has used "masking" substances (and prohibited according to the lists) must declare it before a competition, documenting the pathology he/she has suffered from in order to avoid being accused of doping: it is incredible however to find that at the Athens' Olympics a high number of participants (especially in swimming competitions and

¹⁵⁹ Cf. President's Council on Bioethics, *Beyond therapy: biotechnology and the pursuit of happiness. Chapter three: Superior performance*, Washington, 2003 (www.bioethics.gov).

track and field events) declared suffering of asthma and having to take the appropriate drugs.

3.3 Doping, genetic make-up and sporting performance

The third point concerns a case that is different from those mentioned above, but which is equally significant in the complexity of the problems faced: not new, in truth, as sports authorities already had to tackle it at the beginning of the 1960s, but it has recently come to the forefront of the news after the victory of a female south African athlete at the recent athletics world championships. It is the case of athletes who have in their blood a high level of anabolic steroid hormones, because of an endocrine pathology, and therefore not fraudulently taken externally. This is the case, for example, of individuals affected by an altered functioning of the receptors in androgens¹⁶⁰. The individual is phenotypically female but genetically male, with typically male androgen hormones which act especially at the muscular level. These are “women” (according to public records and the way they look) but masculinised, that is, with a high hypertrophic muscular mass. It is a peculiar condition: functionally analogous to doping, in the sense that it creates an advantage in the competition (they compete with normal females), but different from it, in the sense that the source of the excess of androgens is not “artificial” and fraudulent. The abovementioned Wada definition talks about the “presence of prohibited substances” in the athlete’s body, but immediately after it clarifies that “it is each athlete’s duty to ensure that no prohibited substance *enters* his/her organism”. How should we judge this kind of cases?

According to some, if the “defect” is known before the competition, the subject must not be admitted or if admitted, she must undergo the same sanctions as the athlete using “hexogen” doping, taking advantage of more developed physical capabilities compared to the other competitors. Others however, observe that this exclusion would be contrary to the spirit of sport, as it would discriminate against a person on the basis of her genetic make-up, which is the result of a natural lottery in the distribution of genetic traits, with regards to which she has no fault (or guilt), but also no merit (see later). It must in fact be highlighted that, in reality, all athletes who win have been gifted by nature with some helpful ability. For example, an Australian research examined the gene ACTN3 in a group of male and female sprinters and associated the high frequency of a particular form of this gene to their performance in fast races. Should they be excluded from competing, obviously after having subjected them to genetic analysis? In the ‘70s a Finnish athlete (Eero Maentyranta, winner of seven gold medals in three Olympics) was accused of doping because it was discovered that his blood contained 30% more red blood cells; subsequently, adequate research verified that he and other members of his family had a rare mutation of the gene producing the EPO hormone¹⁶¹. He was therefore absolved, as his advantage was due to his genetic make-up and not external practices, which other athletes subsequently

¹⁶⁰ NBC, Minor’s sexual differentiation disorders: bioethical aspects, 2010.

¹⁶¹ Cf. R. M. Green, *Babies by design. The ethics of genetic choice*, Yale University Press, New Haven, 2007 (chapter. I: Creating the Superathlete)

started to turn to in order to achieve the same advantage: from altitude training to the use of “hyperbaric” tents and finally the introduction of EPO with increasingly sophisticated methodologies.

Regardless of the judgement on the merit of these examples, they focus our attention on the impact of a more general issue on sport, the use of biotechnologies to improve human beings’ physical, psychological and intellectual performance. Naturally – as in all literature about genetic enhancement – we must include a measure of fantasy in presenting these possibilities, founded on a strong genetic determinism which nonetheless everyone considers, at the same time, scientifically wrong. Except in the case of phenotypic traits determined only by one gene, what is due to genes and what to other sources (and to the interaction between them and the genes) in complex phenotypic expressions – and athletic movement is amongst them – is a highly controversial issue from a scientific point of view.

It could be true that, if other environmental conditions are the same (including, as well as training, a good amount of luck, a favourable gust of wind or the right level of humidity, etc.) genetic make-up would make the difference in terms of victory: and seen as – as we have mentioned – there is no merit in having this or that genetic potential, someone proposed to allow the application of biotechnologies in sport, in order to “level” the original genetic gift¹⁶². This way we would achieve the result that victory would belong to the athlete who was better able to use, with creativity and training, the same genetic potential as the others, so that sport would become the realm of equality and merit. Obviously, there are numerous scientific, technical and organisational problems, which the proposal casually underestimates, including the identification of an instrument capable of ensuring the continuation in time of the initial levelling: otherwise, it is practically inevitable that the race to seeking an advantage that makes the difference would resurface and in the end the attention of the sporting world would move from the competition to the “preparation laboratories”. We would face something different from what we call sport today and it is certainly not taken for granted that the public would have for the new athletes the same type of admiration manifested towards Usain Bolt, winner of the recent Olympics and 100 meters record holder.

3.4 Doping and the image of sport

As we have said, the reaction of public opinion towards the doping phenomenon in sport is certainly negative. An athlete who uses doping to enhance his/her performance is immediately stigmatised, at least as being guilty of “cheating in sport”, the public feels deceived, the sponsors rescind their endorsements and the sporting judiciary (and, in extreme, penal justice) intervene to sanction the illicit behaviour. At the basis of this negative reaction we can moreover identify a variety of reasons, but also intuitions and emotions, which involve the nature of sporting practice as it is commonly perceived. On the one hand, the recourse to doping negatively changes this perception, which is linked to

¹⁶² Cf., for example, J. Savulescu, B. Foddy, M. Clayton, *Why we should allow performance enhancing drugs in sport*, in “Journal of Sports Medicine”, 2004, pp. 666-670.

the fact that we admire a sporting performance as we associate it with the athlete's ability to pursue excellence by working on his/her body with his/her means and we feel that the great performances are diminished in terms of strength, speed, grace and cooperation when we discover that they have been achieved thanks to doping. On the other hand, the relationship between the physical, fun and agonistic element is profoundly altered, so that this last one becomes prevailing and controlling. Both the physical and the fun aspects would be lacking if the equality of conditions between participants, which doping alters, could not be guaranteed or if it was "compulsory", for those who want to compete, to put their own health at risk if doping became, or would appear to become, habitual if not indispensable. This negative change in the image of sport is strengthened by the fact that doping is not only a form of fraud, carried out secretly in order to alter the natural condition and achieve (or at least try to achieve) an unfair advantage on the other competitors, but it alters its overall meaning, making the result more important than the competition, success more important than fun, unlimited manipulation more important than the balanced development of the body.

Doping must therefore be considered (and this is the first reason for the prohibition) a violation of the "fundamental" rules of sporting practice, (those that, in short, embody or make thinkable and possible any sporting practice, different from the "regulating" rules, those that determine the concrete implementation of the single practices): those who use doping, in a sense, self-exclude from sporting practices as they deliberately violate one of the fundamental and essential rules of sport, in particular that imposing honesty and forbidding any kind of fraud in order to protect the fairness of the competition as well as to avoid that the pursue of success becomes an end in itself, even if harmful to health. Being essential, this rule cannot be violated without, at the same time, nullifying the meaning of sport which that rule (together with the others) embodies.

3.5 Liberalising the recourse to doping?

As well as safeguarding the image of sport and its future, the prohibition of doping is also connected, in official documents and in literature, to the protection of the health of all the participants to sporting practices. Although there is no accurate epidemiological data (also given the difficulty of carrying out this kind of investigations), there is sufficient evidence about the harm that the systematic use of doping causes, harm that is in addition to that caused by many sporting activities to the physical health of those participating in them.

With regards to this, during the debate it was suggested to liberalise the recourse to doping on the basis of the argument "minimising the damage". The basic idea is that the current policy of prohibition has not been able (as sometimes happens, also in other fields, with prohibitionist policies) to limit the phenomenon, probably also because it has not been followed by deterrents aimed at affecting other phenomena boosting the spreading of doping (and first of all its commercialisation); and in addition it caused further harm to athletes' health due to the secretive character of doping, which at times appears as a sort of "wild" experimentation (see the case of Tetrahydrogestrinone, THG, a substance without any therapeutic value and produced only to enhance sporting performances). It

would therefore be better to liberalise doping, leaving to the athlete's autonomous assessment the decision to use it or not, and in any case keeping under medical observation those who use it. This would also achieve the result of making it possible to collect epidemiological data (which are now missing or occasional) on the harmful effects of doping, therefore allowing the development of adequate countermeasures.¹⁶³

Evidently, this reasoning starts from the perspective of a consequentialist ethics, excluding therefore a deontological point of view based on the respect of the abovementioned values of sport or on the moral duty to protect health. It must however be observed that even in the consequentialist perspective the value of the argument depends on a correct assessment of the consequences. With regards to "minimising the damage", it must be said that liberalisation could maybe allow the reduction of the additional damage connected to secrecy, but certainly not the harm linked to the use, even if "controlled", of doping substances: if it is true that these substances have harmful effects, these effects would surface whether they were liberalised or clandestine. What would change is the quantity, but it is not sure that this change would lead towards a decrease: this may be true for the individual athlete, but it is probable that the overall quantity of damage would increase because of the higher number of athletes who, if liberalised, could recur to doping. Additionally, the objective of minimising the damages, reasonable in the context of policies aimed at relatively eliminating the phenomenon, is recognised as harmful also by those suggesting its liberalisation: but it is not completely incontrovertible that this final objective can be achieved, or at least there is no evidence of it. Finally, it must be stressed that there are no reasons to think that the liberalisation of doping would hand back to the athletes a real choice; instead, it is more plausible to think that liberalisation (unless we imagine the invention of a double circuit for sport) would increase the environmental pressures which already strongly limit the athletes' autonomy.

3.6 Doping and individual autonomy

It is necessary to briefly focus on this point, as it entails positions involving the principle of self-determination to assert that if an athlete, aware of the harm that doping can cause to his/her health, decides to use it, balancing long term damages and immediate benefits (also financial), he/she should be free to do so and therefore the prohibition of doping would be an unacceptable form of limitation of personal autonomy.

The notion of autonomy that these positions refer to is evidently not that, of Kantian origin, contemplating the existence of "duties towards yourself", amongst which we can include the duty to protect our own health and to not consider our body as a means to an end: in this framework, doping can be considered morally unacceptable as a violation of the duties towards ourselves. However, even in a view of autonomy different from the Kantian perspective (for example, that of the liberal tradition referring to J. Stuart Mill), we can observe how the prohibition of

¹⁶³ Cf. B. Kayser, A. Mauron, A. Miah, *Viewpoint: Legalisation of Performance-Enhancing Drugs*, in "The Lancet", Dec. 2005.

doping is not a suppression of individual autonomy. In fact, each participant to sport freely accepts to respect the rule prohibiting doping in order to safeguard the participants' health. Being freely accepted, the rule does not violate the principle of autonomy: no-one is forced to take part in an activity the rules of which they do not intend to accept. Additionally, we must observe that doping produces effects that limit the individual autonomy of those using it: it is typical that those who resort to doping and are discovered do not justify themselves by appealing to their self-determination, but to the direct and indirect pressures exercised on them by the environment, which are therefore a limitation on their real possibility of choice.

It can however be observed that it is certainly possible to express a negative moral judgement, or at least of "foolishness", towards those who knowingly risk their own health for immediate benefits: however, not always the disvalue linked to a certain behaviour is sufficient reason for a prohibition. There are many known examples of morally deplorable behaviours or that put health or life at risk (smoking, "extreme sports", etc.), which nevertheless are not legally prohibited: instead, society accepts the additional costs and it does not discriminate against foolish behaviours with regards to the access to medical care. In the case of doping, however, this consideration does not hold: the effect of limiting individual autonomy and the harm to health does not affect only those who resort to doping. In fact, even worse is the suppression of the other athletes' self-determination, which involves the principle of harm to others as the reason why society limits the exercise of individual self-determination¹⁶⁴. There is no doubt that the recourse to doping causes harm to those who would prefer not to use it, but is defrauded of the right to a fair competition, and could be induced to doping to avoid finding him/herself in a situation of inferiority in competing for victory; and also harm to society, not so much – as we have said – for the additional healthcare costs, but also and mostly because society invests a lot in the promotion of sport and the essence of one of the social activities most appreciated for its social and moral values would be falsified, or at least weakened.

Sport is a social experience and as such requires rules founded on a certain notion of this social experience. The generally shared idea that doping should be forbidden presumes that the aim of sport is not exclusively victory but that such result must be measured through the means used by the athletes in competition. After all, a good competition, a good athletic act, sporting behaviour, fair play are assessments of the athletes' behaviour and of the competition, beyond the simple result. So, it is not about imposing a rule from the outside, according to which the athlete cannot achieve victory by using any means, but it is sportsmanship itself to require that he/she makes an effort to achieve it within certain rules that are not extrinsic, but that express the essence of sport. It's no coincidence, after all, that we use the expression "sporting discipline" to refer to a certain sporting activity and its rules.

On the other hand, being a physical activity, the principle of the respect of human dignity translates here first of all as respect for our own and other people's body, whilst doping, which sacrifices even the health of the people who resort to it, reduces the body simply to a means to an end. Financial and social pressures

¹⁶⁴ Cf. M. Balistreri, *Questioni etiche riguardanti l'uso di sostanze dopanti nello sport*, in Various authors, *Sport e doping. Riflessioni*, edited by M. Vincenti, Priuli & Verlucca, Ivrea, 2009.

towards the use of doping substances can consequently be seen, constitutionally, as obstacles hindering sport from continuing to be an activity that develops the human being and the prohibition of doping is therefore a small measure – which should be accompanied by other forms of protection – amongst the Republic's duties to remove the financial and social obstacles limiting freedom and equality and therefore the full development of the human being (Article 3 of the Italian Constitution). In conclusion, it is not possible to share the idea that the prohibition of doping is, purely and simply, an interference to athletes' individual freedom, being rather a necessarily common rule which athletes should accept as the condition to stop sport from degrading into something else, remaining instead an individually and socially useful activity.

CONCLUSIONS AND RECOMMENDATIONS

1) The judgement on the ethical disvalue of the recourse to doping, which this document wants to reaffirm, is based on a variety of reasons, which range from the need to safeguard the athletes' physical health and their real autonomy of choice to the moral values intrinsic to sport and to the preservation of the meaning of sport in the collective imagination. Although there are different assessments of whether these reasons are able to overcome a certain rational scrutiny, it does not appear however that the reasons given by those against the prohibition of doping are completely convincing or devoid of limitations.

2) The sporting spirit, as such, is the spirit of a competition between athletes who, refining their physical capabilities, are able through training, effort, sporting intelligence and strength of will, to express an essential aspect of our common human identity, that of "merit", which does not only depend on the natural gifts each of us receive from birth, but especially on how each person makes an effort to use them in building their identity (particularly, the identity of athlete).

3) The NBC hopes that any action counteracting the spreading of doping will be strengthened not only by emphasising checks¹⁶⁵ and the use of innovative monitoring instruments¹⁶⁶, but also by increasing information and education, in particular for the young and the amateurs, to whom the Code issued by the Council of Europe is aimed. Involving the responsibility of governments, sports organisations and single individuals (parents, teachers, coaches, doctors, etc.), the Code aims at building around the teenager a sort of protective sphere based on the principle that "those playing fair are always winners" and that therefore the fun and formative aspect of sport should prevail on the agonistic and competitive aspect. The idea (or at least the hope) is that if young people grow and practice

¹⁶⁵ It does not go in this direction what has been cited in the Ministry of Health's Report to the Parliament about the activity carried out in 2008 by the Anti-doping Commission. In fact, it laments a cut in the funds available which allowed fewer checks than in previous years, mostly focused on cyclists, swimmers and footballers. The data remains nevertheless alarming, having recorded a considerable increase of positive results in the amateur sector.

¹⁶⁶ Since the 1st of December 2009 the WADA started the "biological passport" as an experiment, an instrument that would allow to monitor in time each athlete's biological variants and therefore to discover more easily the changes, eventually due to doping, of the usual values of the substances present in the athletes' blood and urine.

sport in this way, they will mature a strength of character that will make them stronger in resisting external pressures. Maybe we can agree that in the long term this is the only possible winning strategy, at least if society wants to continue seeing sport as an element of the quality of life; but at the same time we cannot disagree about the enormity of the task to be carried out, but also on its fragility, especially because of the retroactive effects that the current way of practicing sport involves and the models it proposes, also through the mass media. To realise the objective proposed by the Council of Europe we should immediately carry out many and huge changes, also in attitudes and now inveterate habits: the task is not easy, but it is indispensable if our society wants to continue including sport amongst the elements that make up the quality of life.

Presidenza del Consiglio dei Ministri



KIDNEY DONATION FROM A LIVING DONOR TO A STRANGER (SO-CALLED SAMARITAN DONATION)

23rd of April 2010

INTRODUCTION

The news circulated by the newspapers of three people prepared to donate their kidney to medical establishments and for the benefit of strangers (so-called *Samaritan donors*), and the consequent discussion started in the newspapers, attracted the attention of the Presidency of the Council of Ministers, which asked our Committee to express an opinion with regards to the criticality of this new situation, eventually updating a previous opinion by the NBC, *The bioethical problem of the kidney transplant from a non-blood related living donor* (1997), where kidney donation from a living donor was subordinated to premises of consanguinity or emotional relations between donor and recipient.

The specificity of the problem is in the fact that in this case donor and recipient do not have any family or emotional bond, they do not know each other and the gratuitous organ donation is carried out, as by law, through Organ Transplant Centres, University Institutes, Hospitals believed to be suitable also for scientific research.

In giving their answer, the large majority of the NBC felt that Samaritan donation is legitimate, as it is a supererogatory act, and as such ethically significant for the solidarity motivations inspiring it and it does not involve higher risks, from a medical point of view, for the living donor, than those that can be found in other forms of *ex vivo* kidney removal (donation between blood relatives or “emotionally related”).

The NBC however recalled that the supererogatory act cannot be demanded morally, and even less legally, and it felt that towards this kind of transplant we must have the same precautions recommended and discussed in the previously mentioned '97 opinion.

Given the specificity of the Samaritan donation, the NBC has however highlighted how this must not substitute (unless there are biological priorities of compatibility) transplants from blood related or emotionally related living donors or transplants from cadavers.

It also recommended that this form of donation is exercised respecting the mutual anonymity of the donor and the recipient and that the information given to the donor by the medical establishment to inform his/her consent is complete and exhaustive with regards to the physical or psychological risks involved in this act.

The Committee also requests that the assessment of the donor's clinical condition and of the reasons for his/her act is carried out by a “third party”, different from the medical organisation that will carry out the removal and then the transplant, and that a register, confidential and respectful of privacy, with the names of the potential as well as the effective donors, is created.

Finally, it was suggested that, with a similar treatment also for the other kidney donations from a living donor, this act of generosity is taken into consideration, in order to translate it into a criteria of preference in the waiting lists, should the donor him/herself need a kidney.

This text was drawn up by the Committee's vice-president, Prof. Lorenzo d'Avack, with the written contribution of some Committee members (and in particular by Prof. Salvatore Amato, Prof. Adriano Bompiani, Prof. Roberto Colombo, Prof. Antonio Da Re, Prof. Marianna Gensabella, Prof. Assunta Morresi,

Prof. Demetrio Neri, Prof. Andrea Nicolussi, Prof. Laura Palazzani, Prof. Alberto Piazza, Prof. Giancarlo Umani Ronchi and by Doctor Riccardo Di Segni).

In the plenary meeting of the 23rd of April 2010, the document obtained the consent of Prof. Salvatore Amato, Prof. Luisella Battaglia, Prof. Adriano Bompiani, Prof. Stefano Canestrari, Prof. Antonio Da Re, Prof. Lorenzo d'Avack, Prof. Emma Fattorini, Prof. Silvio Garattini, Prof. Marianna Gensabella, Prof. Claudia Mancina, Prof. Assunta Morresi, Prof. Demetrio Neri, Prof. Laura Palazzani, Prof. Vittorio Possenti, Prof. Rodolfo Proietti, Prof. Monica Toraldo di Francia, Prof. Giancarlo Umani Ronchi, Prof. Grazia Zuffa and of Doctor Riccardo Di Segni.

A vote against was expressed by Prof. Francesco D'Agostino, Prof. Maria Luisa Di Pietro and Prof. Lucetta Scaraffia.

Prof. Isidori, Prof. Luca Marini and Doctor Laura Guidoni abstained.

Prof. Bruno Dallapiccola, Prof. Carlo Flamigni, Prof. Romano Forleo, Prof. Andrea Nicolussi and Prof. Alberto Piazza, absent at the time of voting or at the meeting, have communicated their agreement to the document.

To better clarify the reasons of their vote against, Prof. Roberto Colombo, Prof. Francesco D'Agostino and Prof. Maria Luisa Di Pietro have already sent their personal remarks. Prof. Lucetta Scaraffia agreed with Prof. D'Agostino's personal remark. Prof. Adriano Bompiani, despite agreeing with the document, expresses some additional consideration in a personal remark. The personal remarks are published with the opinion.

The President
Prof. Francesco Paolo Casavola

KIDNEY DONATION FROM A LIVING DONOR TO A STRANGER (SO-CALLED *SAMARITAN DONATION*)

1. The news circulated in the newspapers of three people prepared to donate their kidney to medical establishments and for the benefit of strangers (so-called *Samaritan donors*¹⁶⁷), and the consequent discussion started in the newspapers, attracted the attention of the Presidency of the Council of Ministers, which asked our Committee to express an opinion with regards to criticality of this new situation¹⁶⁸, eventually updating a previous opinion by the NBC, *The bioethical problem of the kidney transplant from a non-blood related living donor* (1997), where kidney donation from a living donor was subordinated to the clause that donor and recipient are emotionally related.

The specificity of the problem is in the fact that in this case donor and recipient are not blood related or “emotionally related”, they do not know each other and the gratuitous organ donation is carried out through Organ Transplant Centres, University Institutes, Hospitals believed to be suitable according to the conditions set by law. Donors and recipients in this case are “total strangers”, not only physically (genetically or with regards to consanguinity), but also psychologically (in the absence of an emotional relation or of an acquaintance) without any form of “return” or “compensation” (even indirect).

From this stems the difference with other forms of donation from a living donor and the reason why the issue raised interest in bioethical reflection, given the needs and the interests worthy of protection that are involved in it. On the one hand, finding organs is a crucial element of the transplant process, especially because the number of organs available is much smaller than the number of patients on the waiting list; on the other hand, as well as the medical problems of the surgery, the main bioethical problems involve the issue of the living donor’s physical integrity, of informed consent, of the spontaneity and gratuity of the act and of the proportion risks/benefits in the relationship with the recipient.

2. The legislation about kidney transplants from a living donor (Law No. 458, 26th of June 1967) was created as an explicit exemption to Article 5 of the Italian Civil Code currently in force, which forbids any act disposing of our own body, if from it can derive a permanent biological damage. And in fact Article 1 of the Law in question states this: “Notwithstanding the prohibition in Article 5 of the Civil Code, it is acceptable, without compensation, to offer a kidney for transplant purposes between living individuals. The exemption is allowed to parents, sons/daughters, adult twin or non-twin brothers/sisters of the patient, provided that the current law is respected. Only in the case the patient does not have the

¹⁶⁷ Definition generally used also in international documents; alternatively we find expression like *non-directive donation* and *donation by altruistic strangers*.

This form of donation is legitimate in many countries, amongst which: Great Britain, Switzerland, The Netherlands, Norway, Sweden, Israel, North America, Canada, Japan and Korea.

¹⁶⁸ The request of an opinion by the Presidency of the Council of Ministers is reported in Appendix.

blood relatives mentioned in the previous paragraph or none of them is suitable or available, the exemption may be allowed also for other relatives or unrelated donors”.

A law that poses a number of objective and subjective premises (indication of the possible donors, control and authorization given by the Tribunal), only in the presence of which removal and transplant become possible. Overall, the entire procedure is surrounded by a series of precautions in order to guarantee the free and conscious participation of the potential donors and the concrete realisation of the interests of solidarity with the exclusion of any financial gain. A law created most of all for the donation between people connected by a close blood relation, which however does not exclude the hypothesis that there can be cases of kidney donation also between non-blood relatives and between people who are not motivated by an emotional bond.

Similar positions can be found in the *Convention for the Protection of Human Rights and Dignity of the Human Being with Regard to the Application of Biology and Medicine* (Oviedo 1997) and the *Additional Protocol to the Convention on Human Rights and Biomedicine Concerning Transplantation of Organs and Tissues of Human Origin* (2002). Specifically, Article 19 of the *Convention* clarifies that the removal of organs from a living person for transplantation purposes may be carried out solely for the therapeutic benefit of the recipient and where there is no suitable organ available from a deceased person or no other alternative therapeutic method of comparable effectiveness¹⁶⁹.

Therefore, with regards to the *Samaritan donor* hypothesis, European Union legislation does not constitute an impediment to the transplant.

3. It was the NBC that, in the opinion *The bioethical problem of the kidney transplant from a non-blood related living donor* (1997), generated because of a request by Prof. Girolamo Sirchia, focused on the legitimacy “of the removal from living donors, even those who are non-blood related but only *emotionally related*”, listing in this category the spouse, the stable partner or a friend “whose emotional bond, such to justify an altruistic act like the donation of an organ, can be effectively proven, but this should be limited to particular cases”. The NBC also recommended that “the documentation relative to this emotional bond” is collected together with a psychological/psychiatric assessment aimed at proving the true spontaneity of the donation¹⁷⁰.

¹⁶⁹ The *Convention* does not give particular importance to blood relation. On the other hand, this can be substituted by the relationship between husband and wife, widened to include the relationship between stable partners, also because consanguinity cannot be absolute guarantee of spontaneous donation. A thesis that is closer to the guidelines which prevailed in the Council of Europe and where the principle of the autonomy of the “competent donor” is considered essential to the procedure.

¹⁷⁰ *The bioethical problem of the kidney transplant from a non-blood related living donor* (1997). The points of view expressed by the NBC about the donation and transplant of organs and embryonic cells can be found in the following documents: *Definition and detection of human death* (February 1991); *Organ donation for transplantation purposes* (October 1991); *Organ transplants in childhood* (January 1994); *The anencephalic infant and organ donation* (June

- The NBC's preoccupation at the time was due to the following reasons:
- 1) the motivation to donate a kidney could be altered or invalidated by psychological disorders or pressure/coercion external to the donor's will;
 - 2) at the basis of a kidney donation from a non-blood related individual there could be a financial incentive.

In effect the NBC on the one hand highlighted how the act, which can be qualified as supererogatory, should be given very high ethical standing, considering the aim of solidarity it intends to achieve; on the other hand, it insisted on the objective dangers linked to this practice, so much so that it recommended for this procedure to be always carried out in exceptional circumstances, for an absolutely free donation to be guaranteed and, in principle and in effect, for any hypothesis of commercialisation to be resisted.

4. The case of kidney donation from a living donor who does not have any connection with the recipient, is certainly different from other kidney donations, it is similar to them in some aspects but it has different characteristics.

The intention, in fact, is not to benefit one person with whom we may or may not have a blood or emotional relation (where, in weighing up risks and benefits, the psychological "return" can also be calculated, due to the gratification of the act of donation in itself, destined to a known and close person) nor it translates in an exchange agreement between an unknown couple (the so-called *cross-over* transplant with a sort of "return" and "compensation" of the sacrifice due to the exchange in the donation, which directly benefits a loved one). Samaritan donation is done on the basis of an altruistic act through hospitals, for the benefit of an anonymous beneficiary or, in general, of society as a whole. The donation finds justification in the act of donating itself and it cannot be subjected to any possible psychological or moral pressure, even unknowingly, from those who (blood or emotionally related) need a transplant.

It must be remembered that international literature takes into consideration the eventuality that the donation from an unrelated living donor could also be "conditioned". It is the situation that arises when the donor gives the medical centre a binding indication of the hypothetical future recipient, explicitly including or excluding some categories. And this on the basis of area of residence, race, culture, religion, sex, age, social class or fame, lifestyle, moral behaviour, responsibility with regards to pathologies (e.g. alcoholic, drug addict, smoker).

The NBC believes that in organ donation it is ethically unacceptable to introduce forms of social discrimination and asks that the impartial criteria objectively guaranteed by immunological compatibility, urgency and priority in the waiting lists are preserved.

Therefore, in the case of the particular procedure of unconditioned Samaritan donation, it must be verified if this act of donation respects the ethical principles recommended in all other hypothesis of kidney transplant. The fact that legally it

1996); *Animal testing and health of living beings* (April 1997); *NBC opinion on the proposal for a moratorium on human Xenotransplantation clinical trials* (November 1999); *Motion on the trade of organs for transplant purposes* (June 2004); *Opinion on "the cellular therapy of Huntington's disease through the implantation of foetal neurons"* (March 2005).

is not forbidden and it is not explicitly excluded, does not exempt us from an ethical consideration relative to its justifiability (even if they are infrequent cases).

For an answer, first of all it must be verified if this decision and the consequent authorised procedure present more risk factors than those always denounced in other forms of abovementioned kidney removal from a living donor, so that they negatively affect the ability to respect the most important principles that characterise the ethico-legal regulations on transplants. These can still be briefly summarised in the expectation that consent is free, informed about immediate and future risks due to the donation and that it can be withdrawn up to the moment of removal; that Samaritan donation is considered as residual compared to the donation from a blood-related donor.

5. With regards to the ethical problems inherent to Samaritan donation, the NBC observes what follows.

5.1. International charters and legislations described the offer of organs for therapeutic use with the term “gift” and this indicates freedom of choice, no financial gain and the refusal of any approach, even veiled or indirect, to forms of commercialisation.

With this premise, the fact of freely donating to an unrelated person, outside of family networks or interpersonal relationships, similarly to what happens in other circumstances (the donation of blood, bone marrow, part of the liver) is to be highly appreciated. The donation to an unrelated individual finds justification in the recognition of a link of “inter-dependence” that connects all human beings and that can push towards an asymmetric and non-mutual responsibility towards others.

5.2. In the Italian legislation *ex vivo* organ donation is considered a residual act compared to *ex mortuo* organ donation, if there is an actual biological-clinical impossibility to transplant a particular organ removed from a cadaver or if there is a lack of availability of organs from cadavers.

The residual nature of the removal of an organ *ex vivo* finds its reasons in a variety of considerations. Mostly, that the physical (biological) integrity of a human subject is an individual and social good of such high order that it can be sacrificed not only consciously and voluntarily, but because of a proportionate or superior benefit, which cannot be realised without violating someone’s personal integrity.

This residual character of the donation must also be at the basis of Samaritan donation, so that *ex mortuo* transplants must remain the preferred method, to be disseminated and supported.

5.3. In this procedure the NBC believes that *the principle of anonymity* is indispensable, that most of all must be realised avoiding that the people involved in the transplant (donor/recipient) have a relationship either before or after the operation. A principle that – also guaranteed by the healthcare worker – on the one hand ensures that the donation is not bound by obligations or conditions between the parties involved and on the other hand avoids the problem, frequent in the removal from a living donor, of comparisons between donor and recipient, which can cause in each of them negative psychological attitudes. Anonymity

would also avoid these cases becoming the object of “exploitation” by the media, depriving them of their authenticity¹⁷¹.

In the informed consent, undersigned by donor and recipient, which will have to be given a lot of attention and we hope will be set up uniformly over all the national territory, the two subjects will be informed of the confidentiality of their personal identities and clinical data and their assent to not get to know each other will be clarified. Nevertheless, the traceability of all clinical data will be preserved in line with current regulations, but ensuring anonymity.

The recipient must be informed that the kidney comes from a Samaritan donor.

5.4. The Italian transplant network gives ample guarantees that the kidney has not been sold or procured by intermediaries, who could obtain financial gain from it, but that it will be destined to those who have most urgent need of it.

The problem, similar to all organ donations to non-related persons, is the reliability or not, of the way the healthcare network is organised. The role of the doctor and/or of the healthcare organization in these situations is not simply that of intermediary, because receiving the organ gives them obligations towards both the donor (obtaining a clear consent, giving exhaustive information about the risks and the aims of the surgeries, about the possibility of withdrawing consent for the removal at any moment, the commitment to anonymity, etc.) and the eventual beneficiary (state of real and urgent need, suitability of the organs, etc.).

It is necessary that whilst ascertaining the donor’s motivations, healthcare Centres always take into consideration that kidney donation from a living donor is in contrast, as already mentioned, with the general prohibition to self-mutilate accepted in our legislation and that the consent to removal is recognized as a derogatory hypothesis and as such must be applied restrictively. It follows the need to clarify to the subject offering to donate, that this availability is his/her choice, but that it does not give rise to any expectation or right (the so-called right to donate), being subordinated to the eventual availability from a cadaver and a parent and to the necessary medical assessment of the donor’s clinical condition. After all, if the kidney offered can benefit another patient, it is also true that the person donating it can encounter risks and in time a reduced functional reserve (potential vulnerability) that can determine the need for medical care or even a kidney transplant. From a social perspective, therefore, as in any organ donation from a living donor, it may not be possible to describe the result obtained as “net benefit”: the solution of the problem relative to the patient could in fact cause an illness in the donor. It would be appropriate to take this into account by contemplating in the donor’s favour a preferential criteria in the waiting lists, should the need of a kidney arise.

Then, to avoid any form of veiled trade¹⁷² the Committee recommends “guidelines” that, although different from region to region or between interregional

¹⁷¹ A failure in the commitment to guarantee the anonymity, both of the donor and the recipient, by healthcare personnel – in particular if it leads to the illicit exchange of money and/or material advantages – should be considered as “illegal organ trafficking”, and as such it can undergo (in iure condendo) the current reflections of the European Council aimed at carrying out an adequate prevention and repression.

groups, recall common principles, shared and scientifically sound, transparent and documented for any interested party requesting it.

The guidelines, accepted in the Agreement between the Healthcare Ministry, the Regions and the autonomous Provinces of Trento and Bolzano, for kidney transplants from living donors and cadavers¹⁷³ should therefore be modified to be adapted also to Samaritan donors.

5.5. Also in the case of *Samaritan donors*, there is a fear that the motivation for the act can be altered by questionable reasons: pathological attitudes, states of depression, the hope of gaining benefits from society (a sort of indirect return for your own kindness), the desire for a possible, future, moral or financial involvement with the recipient.

In relation to this, as it already happens for other donations from a living donor, the NBC believes that it is appropriate for the donor to undergo medical assessments aimed at identifying any physical-psychological contraindication. The assessment of a subject's suitability to be a donor must be carried out by a commission, made up by various professions and independent from the medical establishment executing the removal and transplant.

However, against these and other preoccupations we can put forward the same reassuring arguments generally expressed towards other forms of kidney transplant, which can be summarised in the idea that any argument aimed at limiting, if not excluding, organ donation from a living donor is a prudential argument, being, as mentioned above, the donation in itself not only a morally legitimate act, but in fact a highly commendable one, which is even more so, and with a smaller risk of commercialisation, in the case of Samaritan donors.

Conclusions and recommendations

= The NBC, in answer to the Presidency of the Council of Ministers with regards to the problems raised by so-called Samaritan donors, believes that this practice is bioethically acceptable. In fact, we can apply to it the same qualification that, in the previous opinion, *The bioethical problem of the kidney transplant from a non-blood related living donor* (1997), was attributed to the donation from an *emotionally related* subject, that is, that this is a supererogatory act, and as such ethically commendable for the motivation of solidarity that inspires it.

The supererogatory act cannot be expected either from a moral perspective, and even less from a legal perspective and it must be exercised respecting the mutual anonymity of the donor and the recipient.

¹⁷² We can foresee follow ups also in countries where the trade is forbidden because of organisations or centres which, in competition, propose "better offers" to this category of donors. A competition that, once started, can lead to dangerous practices from an ethical point of view, like the use of less rigorous criteria to select donors, or a reduced focus on anonymity, or a financial compensation masked as "reimbursement of expenses" (healthcare, insurance, travel or being absent from work, etc.).

¹⁷³ *Linee guida per il trapianto renale da donatore vivente e da cadavere*, Gazzetta Ufficiale n. 144 of the 21st of June 2002.

= Also in consideration of the fact that this procedure does not involve higher risks, from a medical point of view, for the Samaritan donor, than those present in any kind of *ex vivo* kidney removal, the NBC believes that the same precautions recommended and contemplated in the abovementioned opinion must be employed towards this type of transplant.

= Kidney donation must not be a substitution (unless there are biological priorities of compatibility) to the transplant from a blood related or an emotionally related living donor or to the transplant from a cadaver.

= It is necessary – as in any other donation from a living donor – to ascertain that the donor fully understands the surgery's potential risks, its irreversibility and the psychological consequences.

= It is necessary to set up confidential registers guaranteeing the privacy of the names of the potential and effective donors.

= We recommend that an assessment of the donor's clinical and psychological condition with regards to the motivations of the act is carried out by a "third party", different from the medical establishment that will execute the kidney removal and transplant, and that the procedure, as already happens in *ex mortuo* transplants, guarantees the correct collection of the organ and of its allocation, so that the respect of the key principles of transplantation is ensured: no financial gain, anonymity, transparency, fairness, safety and quality.

= We propose that, with a similar treatment also for other kidney donations from a living donor, this act of generosity is taken into account, in order to translate it in a preferential criteria in the waiting lists, should the donor himself need a kidney.

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PERSONAL REMARKS

Personal remark signed by Prof. Adriano Bompiani

As the question presented to the NBC was discussed to establish whether kidney donation from a living donor to a stranger – giving this as an unrenounceable requisite together with that of the absolute lack of financial compensation – has the ethical value of “benefit” for the recipient affected by a serious renal failure, the answer could only be “positive”.

This does not hinder an evaluation on the appropriateness for the healthcare authorities to accept or not this kind of kidney donation, evidently supererogatory, from a living donor to a stranger.

Personally, I take the liberty of highlighting that the NBC did not explicitly examine the strictly “legal” aspects of a particular method of finding kidneys, urged by the strong imbalance between donation from cadavers and “waiting lists”, which is being debated in many European countries. These aspects come under the jurisdiction first of all of the political power and should be coordinated at the European level.

Personal remark signed by Prof. Roberto Colombo

The *Opinion* on “Kidney donation from a living donor to a stranger” intends to tackle, from a bioethical and bio-legal perspective, a particular consensual method of *ex vivo* organ transplant, which has also emerged in Italy because of three persons’ availability to having a kidney removed in favour of a nephropathic patient unknown to them. The “exceptional” nature of this form of organ donation compared to *ex mortuo* donation and, secondarily, *ex vivo* donation from relatives and people connected by a bond of affection or friendship, was expressed in the *Opinion* by using the operative category “residual” in contrast to the other two (cf. paragraphs 4 and 5.2) and the justification of the “exception” was found in the high ethical and social standing of acts of “gratuity/altruism” of a non-futile nature (cf. paragraphs 4; 5.1; *Conclusions and recommendations*) and in the consideration of the unavailability of a sufficient number of organs from cadavers (cf. paragraph 5.2). The guarantee of the “honesty” of such an ethical organ donation has been entrusted to the “mutual anonymity of the donor and the recipient” (*Conclusions and recommendations*) and to assessments aimed at excluding “that the motivation for the act can be altered by questionable reasons” (paragraph 5.5).

As well as the “impossibility of legally verifying the ultimate reason for Samaritan donation (compared instead with the possibility of legally verifying the consanguinity or the emotional bonds that can exist between donor and recipient)” and the consideration that the “exceptionality” of *ex vivo* organ donation, in contrast with the “fundamental legal principle of the non-disposability of the body”, can only be justified “by the very high ethico-legal value of being

blood related” or by “emotional bonds that can be fully compared to those existing in a family context” (F. D’Agostino, *Personal remark, see further*), I believe that other arguments make the ethical conditions and the legal guarantees suggested in the *Opinion* too weak to resist possible and unacceptable deviations from the normal procedure in the proposed regulations.

We can ask ourselves whether mutual anonymity is, on the one hand, an absolute need to guarantee the quality of “gratuity”/“gift”/“solidarity” of the organ donation to patients who are not linked to their donors by a bond of consanguinity, affection or friendship (civil life has seen supererogatory acts that show an appreciated and unquestionable individual and social solidarity, which do not contemplate the anonymity of the donor and the beneficiary of the gift); and, on the other hand, we can wonder whether anonymity is sufficient and effective in preventing the risk of illicit organ trafficking and the commercialisation of parts of the human body (considering the practical need of intermediaries between the donor and the recipient – who perform clinical, administrative and logistical tasks – and the difficulty of carrying out non-invasive assessments in all phases of the transplant and afterwards).

With regards to the first point, in kidney transplants – as in other forms of donation of biological components of the human body destined to be permanently transplanted and integrated in another subject (unlike blood or other tissue with a high cellular *turnover*) - there can be cases of pathologies in the transplanted organ or in the surrounding tissue which, to be given diagnostic, etiologic and therapeutic consideration, might need the knowledge of the donor’s name and of his/her personal and clinical data. In contrast, the discovery of a pathology (of genetic or cellular origin) in the even numbered, non-donated organ, occurred after the donation, can be significant for the prevention or the monitoring of the same pathology in the recipient. In these cases, for the donor’s or the recipient’s benefit, the rights and duties of the parties involved could suggest or even impose an ending to the anonymity, making it, in fact, a condition that remains *ut in pluribus* and not *semper et pro semper*. It is true that revealing the donor’s and/or the recipient’s identity could involve only a transferral of personal and clinical data from the transplant surgeon to the GP and vice versa (both bound by professional secrecy), but it is also known that the more the subjects involved and the exchange of sensitive data multiply, the more the risk of revelations (international and non-international) to third parties.

The second point leads us to ask ourselves, as it has been done for other individual acts of donation that present some similar aspects, if it is not the transparency of the identity of the donor and of the beneficiary to guarantee, better than any other condition, that badly intentioned third parties (individuals and organisations) do not interfere with the relationship of gratuity between people and exploit the act and the circumstances to gain illegal profits or advantages.

Finally, I believe that the character of “circumstantial residuality” of the so-called “Samaritan donation” (case by case, and not in relation to the collective demand of the patients awaiting a transplant and to the overall availability of organs *ex mortuo* or from a blood relative) – the only type of “residuality” that

would not betray the principle of “exceptionality” of every single donation to a stranger – can be strongly guaranteed only by a “*call for proposal*” (public appeal) of a hospital or transplant centre in case of an individual urgency due to the extremely critical conditions of a patient on the waiting list for an *ex mortuo* transplant and whose family, friends or acquaintances are not suitable or available. A situation, this, different from anticipating, instead, signing up voluntary donors, deemed physically and psychologically suitable, in a national or regional register of potential donors (cf. *Exposition of the opinion and Conclusions and recommendations*), where the “exceptional” nature of the decision to deprive your body of an organ “because of a proportionate or superior benefit, which cannot be realised without violating someone’s personal integrity” (paragraph 5.2) would be much less evident and unequivocal, if there is no possibility of identifying such a “proportionate or superior benefit” in a concrete and current case. Even the evaluation of the authenticity of this act of donation, highlighted in the *Opinion* as condition for its significance and acceptability, would be more objective and sensible for being closer to the donor’s deliberate will (because of a clear appeal to his/her freedom by a patient’s state of need) than in the remote perspective of an eventual need deriving from the unavailability of organs from a cadaver or blood relative.

Personal remark signed by Prof. Francesco D’Agostino

However ethically and emotively suggestive the hypothesis of the *Samaritan* donation of a kidney can appear, I believe that it is unjustifiable, essentially for *bio-legal* reasons.

To argue this statement, I will take for granted some extremely general bioethical principles of the donation of an organ or more in general of parts of the human body by a living donor. They can be summarised in a *prerequisite*: that of the acquisition of a *fully informed consent* both from the donor and the recipient (a prerequisite that is valid for any medical procedure) and three criteria, the first, bioethical (*absolute lack of financial gain*), the second, biomedical (the *non-futility* and *harmlessness of the removal for the donor*) and the third, *bio-legal* (the donation by a living donor must be legitimised not as an unquestionable way of disposing of your own body, but as a *rigorously justified exception* to the fundamental legal principle of the *non-disposability of the body*). These three criteria, naturally, can be easily distinguished theoretically, but interlink with each other.

The criterion of *no financial gain* is absolute and it is down to the wisdom of the individual legislator to identify adequate procedures in order to avoid organ donation becoming a form of monetary (payment) or non-monetary (we can hypothesise various forms of organ *exchange*) commercialisation. Unfortunately there’s often a lack of effort about this on the legislator’s part. The paradoxical use of the expression *donor for a fee* is proof, according to some, of the unacceptable spreading of *bad faith* in well known biological contexts (think

about the ambiguity of the expression “reimbursement of expenses” in reference to the donation of gametes for procreative or research purposes).

The criteria of *non-futility* and *harmlessness* are difficult to define, because they must be evaluated on the basis of the risks the donor is made to undergo, on the pathology’s gravity and on the level of benefit the recipient can have from the transplant. They still have to be evaluated exclusively by doctors, with what is essentially a case by case judgement. We can’t see particular difficulties in this regard, if not those that can be generally linked to the uncertainty that is structurally inherent to any form of diagnosis, prognosis and therapy.

Much more complex is the strictly *bio-legal* problem of the donation from a living donor. *If we believe that the human body and every single part of it are in principle non-disposable* (a principle that I believe is taken for granted and unquestionable), to justify the donation of an organ it will be necessary to identify a *legal* principle that is of an even higher order. This appears particularly difficult, because the non-disposability of the body is a direct consequence of a *person’s dignity* who, disposing of his/her own body would degrade it (and therefore would degrade him/herself) to mere *instrument* (Kant, *Metaphysics of morals, The doctrine of virtue*, part I, book I, first chapter, paragraph 6). The supporters of Samaritan donation usually justify this form of donation as a variant of the supreme principle of *solidarity* in its noblest form (*Kindness of strangers*): a principle that is undoubtedly very suggestive, but which finds its proper place in experiences that do not have a bioethical relevance (like many forms of voluntary work, or adoption, fostering and other similar situations) and in which there is no risk of the *exploitation of self* as highlighted by Kant, who arrived to condemn even the sale or donation of a *tooth*¹⁷⁴.

The donation of a kidney from a *relative* can seem justified, so that it overcomes the principle of non-disposability of the human body, because of the very high ethico-legal value of family ties, thanks to which every subject, through his/her family role, states and defines his/her identity (the *value-person* would presume the *value-family*, seen as there is no human being who comes into the world outside the context of a family community). Although family contexts are not devoid of very concrete risks of *exploitation* or even *violence*, it seems reasonable to think that in extreme circumstances, like that of a patient needing the donation of a kidney for therapeutic purposes, it is justifiable to legitimise the organ donation (in the respect of the bioethical and biomedical conditions mentioned above). This justification was wisely extended by the NBC (*The bioethical problem of kidney donation from a non-related living donor*, 1997) to hypotheses where the donor and recipient are *emotionally related*, that is, united by emotional bonds that can be fully assimilated to those of a family context. These justifications have a specific *bio-legal* significance, because they can

¹⁷⁴ The example can make us laugh. But as well as Fantine’s episode, narrated by Victor Hugo in *Miserables*, which demonstrates how Kant might have in mind concrete situations, when we accept the indiscriminate availability of the body is very difficult to then refuse more in general the indiscriminate availability of the person, in *all* its dimensions. If the sale of a tooth is considered legitimate, we don’t see why the sale of a *vote* should not be.

undergo a social positive verification, the only form of verification allowed in the law.

I believe that there are no sufficient arguments to go beyond these wise boundaries established by the NBC at that time. Surpassing them, in fact, seems *bio-legally risky*, because there is no *convincing* legal technique to ascertain the authenticity of a Samaritan donation. The objectively *extreme* character of this donation would lead us to think that only very few people, with an absolutely *heroic* morality, could declare their availability to do this; but the law is not able to regulate and guarantee such noble practices (because this is what they are and this is what the law is supposed to do), practices that would project it in such a rarefied atmosphere, to appear easier to imagine than to experience (when, reasonably, will we happen to meet a Samaritan donor?). Evidently, we do not deny that these extreme possibilities can happen. I simply observe that the duty of the law is to manage *extreme* but ordinary situations that can be repeated and standardized¹⁷⁵.

In reality, the impossibility to verify legally the *ultimate reasons* of the availability for a Samaritan donation (compared instead with the possibility to legally verify consanguinity or the emotional bonds that can exist between donor and recipient) effectively means accepting an act that disposes of the body and consequently the alteration, unjustifiable and probably irreversible, of a fundamental legal principle.

In agreement with this *Personal Remark*: Prof. Lucetta Scaraffia.

Personal remark signed by Prof. Maria Luisa Di Pietro

The kidney donation from a “non-emotionally related” subject raises some ethical problems, which make it completely different from the kidney donation from an “emotionally related” subject. On the other hand, in evaluating human actions we don’t only take into account the object or the purpose of the action (*finis operis*), the intention of the acting subject (*finis operantis*) and the means, but also the circumstances. And, if in both cases the object or the purpose of the action and the intention of the acting subject (helping those whose life is in danger because of the unavailability of a kidney for transplant) and the means

¹⁷⁵ It could be objected that similar preoccupations should give way to the consideration that the survival of people affected by very severe nephropathies is at risk. Unfortunately, this argument, although very suggestive, clashes with the criteria usually accepted to bioethically legitimise not only transplants from a living donor, but also from a cadaver. Those who want an argument like this to prevail should first, to be coherent, demonstrate the existence of a general *duty to give up* (and not simply to *donate!*) a kidney (and more in general any organ) from a cadaver, in favour of patients whose life is in danger, and without the need to have the previous consent (explicit or implicit) of the deceased or his/her family. The ethics of organ donation however moves in the opposite direction.

(donating a kidney) seem similar, very different is the situation in which this decision is taken.

In the case of kidney donation from an “emotionally related” subject, there is, on the donor’s part, the choice of helping a loved one towards whom he/she feels a great sense of responsibility, to the point of being available to sacrifice a part of him/herself. In the case of a donation from a “non-emotionally related” subject, a fundamental dimension of the gift is missing: the interpersonal relationship between human beings. In fact, the donor does not know the recipient, so that it seems unsuitable to use the term “donation”. Additionally, this practice – coming away from a parental and emotional context – not only distorts the meaning of the donation itself (gifts happen when there is a relationship) sanctions also a dual view of the relationship body-person. To avoid reducing the bioethical debate on this point to the mere request of consent or to a variety of procedures, we cannot – therefore – but ask the question: what is Man and what does the body represent in his/her life and for the formation of his/her individuality?

Experience itself is sufficient to highlight the fact that Man can only be his/her own body, which is the beginning of his/her individuality and identity. Reducing the relationship body-person to the category of being and not being, leads – consequently – to the non-disposability of the body: man – Kant writes in *Lectures on ethics* – “cannot do with his body what he will. The body is part of the self; in its togetherness with the self it constitutes the person. A man cannot make of his person a thing”, or dispose of himself as a thing: “he/she is not allowed – we still read in the *Metaphysics of morals* – sell a tooth or another part of himself”. We can, in fact, dispose of things but not of people: “The prohibition of killing a man – Guardini writes in *The right to life before birth* – represents the greatest achievement of the prohibition of treating man as a thing”. Considering the human body as an object we can dispose of, even if only in some of its parts, means thinking about the body as the aseptic covering of an ability to choose (the Cartesian *res cogitans*) which decides the destiny of it. Can the reality “Man” be broken up and put together again only on the basis of the needs of a society that requires him to dispose of his body? And, once we can dispose of our bodies and of its parts, why should it be forbidden for it to be the object of a sale?

Certainly, to what we have said so far it could be objected that it is already possible to dispose of our own body and of its parts, as we allow the donation of blood or bone marrow and kidney by an “emotionally related” subject. Given that blood or bone marrow donation involve a “momentary” availability (these are tissues that reproduce quickly), the availability of a part of the body in the kidney donation by an “emotionally related” subject is justified in the exceptionality of the situation and in the strong emotional bond with the recipient. With a limitation: the possibility, in any case, of immediate or future damage following the donation both in the case of tissues and – even more so – a kidney. In this last case we cannot avoid mentioning the risk of short or long term damage, with the possibility of initiating a chronic kidney failure so that the donor must undergo dialysis or transplant. For this reason even the “emotionally related” subject must not – anyway – forget his responsibility towards himself and other people apart

from the potential recipient, therefore we cannot condemn him for refusing the donation.

Allowing a kidney donation from a “non-emotionally related” subject, even with all the precautions possible, would start a practice that could involve – amongst other things – an increase of pathological conditions in society, in order to respond to the health requirements of others. There is, however, a big difference between pathologies that happen and pathologies that are the consequence of human choices also accepted by society, although for reasons of great moral value and in the name of solidarity.

Even if solidarity – in its social dimension (participating to the realization of a common good) and supportive dimension (intervening with more focus where there’s more need) – is fundamental in human life, we must ask ourselves – however – if it should not have limits. In other words, if in the name of solidarity there are those who are allowed to decide, in a particular situation that cannot be resolved in any other way, to risk their own life to the extreme of sacrificing themselves, society must – nevertheless – make sure that such extreme situations do not reoccur. From an objective point of view, in fact, we must take into account that every life has an incommensurable value and that we cannot allow one to be at risk in favour of another; from a subjective point of view, it is possible that an unlimited solidarity also involves less responsibility towards ourselves and our body.

These considerations precede the analysis of the criticality that kidney donation from a “non-emotionally related” subject can raise from an organisational point of view or of its effect on the balance of donation procedures, which are, anyway, relevant and could be prevented in part.

It does not resolve, however, the anthropological and ethical *vulnus* – which is not taken into consideration in the document by the National Bioethics Committee – created by kidney donation from a “non-emotionally related” subject. The avenues to be used are others, amongst which, first of all, the promotion of a culture of post-mortem donation.

The undersecretary of State
To the Presidency of the Council of Ministers
PROTOCOL NUMBER 16385/SSL/2010

Rome, 19th of February 2010

Illustrious President,

In the past few days Italian public opinion has been profoundly affected by the news, widely reported in the main daily newspapers in our Country, that three people, keen to remain rigorously anonymous, expressed their availability to donate, in the spirit of absolute gratuity, a kidney, whilst still living, without expecting to indicate a specific recipient. Rightly, the newspapers reporting the news, always effective in linguistically summarising for the public the news referring to singularly new situations, called them “Samaritan donors”.

There is no doubt that, should the authenticity of the news be rigorously ascertained, it would refer to a new situation, as opposed to the norm, in cases, which are few, of kidney donation from non-related living donors, tackled by the *National Bioethics Committee* in the past, 17th of October 1997, by publishing the opinion *The bioethical problem of the kidney transplant from a non-blood related living donor*. Moreover, in this opinion, the specific focus of the Committee was the donation between “emotionally related” donor-recipient.

Prof. FRANCESCO PAOLO CASAVOLA
President of the NBC
Via della Mercede, 96

00187 – ROME

*The Undersecretary of State
To the Presidency of the Council of Ministers*

Considering the considerable amount of years since then, the indubitable progress of transplant medicine, the different experiences in other countries, as well as the new and until now unforeseen bioethical perspective in which the offer of the “Samaritan donors” has occurred, we believe that it is fitting for the *National Bioethics Committee* to again express an opinion on this issue, identifying the criticality of this new situation and updating the previous opinion, within the limits it deems appropriate.

Gianni Letta

Presidenza del Consiglio dei Ministri



**SECRECY IN DRUG REGULATORY SYSTEM
PROCEDURES**

28th of May 2010

INTRODUCTION

The document tackles the ethical issues concerning the secrecy of data in new drugs authorisation procedures and in the information about the drug's development after its introduction on the market. The regulatory authorities are sworn to secrecy due to European regulations and therefore they make public only summative documents about the documentation and the procedures on the basis of which a new drug is introduced on the market. The pharmaceutical industry believes it has the right to uphold the secrecy to avoid spreading information that could be useful to the competition, given the large capital they have to invest to develop a new drug.

After an analysis of the international and national legal framework of reference, the Italian NBC tackles the arguments of those who support the "secrecy" and the arguments in support of "transparency". The Committee believes that ethics demands the full availability of the data – with well-defined – to scientific societies or patients and consumers associations, insofar as toxicological data and clinical studies are concerned, seen as the patients participate to the trials free of charge and with risk (even if limited). The availability of these data must be possible only after the procedures of authorisation or rejection have been completed. The NBC observes that the *Food and Drug Administration* publishes all the data whilst this does not happen with the European body EMA and consequently with all national agencies. The NBC hopes for an abolition of the secrecy so that the patients' interest can prevail over industrial interests.

The document has been elaborated by the working group coordinated by Prof. Silvio Garattini, with the contribution of Prof. Carlo Flamigni, Prof. Laura Guidoni, Prof. Assunta Morresi, Prof. Demetrio Neri, Prof. Andrea Nicolussi, Prof. Monica Toraldo di Francia. Doctor Sergio Dompé, President of the Farministry and Doctor Sergio Pecorelli, President of AIFA were consulted.

The document was unanimously approved by those present: Prof. Salvatore Amato, Prof. Luisella Battaglia, Prof. Adriano Bompiani, Prof. Stefano Canestrari, Prof. Roberto Colombo, Prof. Bruno Dallapiccola, Prof. Antonio Da Re, Prof. Lorenzo d'Avack, Prof. Maria Luisa Di Pietro, Prof. Riccardo Di Segni, Prof. Carlo Flamigni, Prof. Romano Forleo, Prof. Silvio Garattini, Prof. Marianna Gensabella, Prof. Aldo Isidori, Prof. Assunta Morresi, Prof. Andrea Nicolussi, Prof. Laura Palazzani, Prof. Vittorio Possenti, Prof. Lucetta Scaraffia, Prof. Monica Toraldo di Francia, Prof. Giancarlo Umani Ronchi. Prof. Francesco D'Agostino and Doctor Laura Guidoni, absent from the meeting, expressed their agreement.

The President
Prof. Francesco Paolo Casavola

This opinion intends to discuss the ethical aspects raised by the secrecy of data in new drugs authorisation procedures as well as in the information regarding the phase following their introduction on the market. As it will be clarified later, the reason usually given to justify secrecy is to avoid damaging the pharmaceutical industry in its research for the manufacture of new drugs, giving the competition an unfair advantage by divulging particularly relevant data and information. This document however states that the argument of protecting private economic initiative and industrial monopoly must be not only adequately clarified in relation to its effective importance in justifying secrecy, but also integrated by other points of view that must be taken into account for a thorough bioethical evaluation of the issue. In other words, it is necessary to balance it with other relevant principles from both a specifically ethical perspective as well as constitutional values.

1. Framework of reference

First of all we must remember that private economic initiative is not a value that has absolute protection in the Italian Constitution, according to which it “must not be carried out against the common good or in a way that may harm public security, liberty, or human dignity” (art. 41 of the Constitution). This principle after all is in line with other fundamental guidelines of European market regulations, based on the principle of safeguarding consumers. In particular, we cannot forget the right to the protection of health, recognised in the Constitution as a basic right of the individual and in the public interest (art. 32 of the Constitution). This right forces us to avoid abuses that can favour the consumption of drugs whose therapeutic efficacy has not been adequately tested and verified. In addition, secrecy could be shown to be against the right of patients, both current and future, to be properly informed. From the point of view of public interest, secrecy must be compatible with the constitutional value of scientific and technical research (art. 9 of the Constitution), the promotion of which requires the dissemination of information and data concerning the procedures and outcomes of the tests. As we can see, these are principles that cannot be underestimated or sacrificed by allowing secrecy to extend beyond what is justified by the need of protecting someone’s ideas from being inappropriately commercially exploited by someone else.

We believe it is necessary to make available the information that can affect the health and well-being of the patients as well as that which is useful to the advancement of scientific knowledge.

2. The European regulatory system

The EMA (*European Medicines Agency*) is the European regulatory body, which uses its scientific technical body, the CHMP (*Committee on Human Medicinal Products*), to evaluate dossiers relative to new drugs. The CHMP’s assessment determines whether all European Union Countries must introduce the new drug on the market. The CHMP, made up of experts representing 27 Countries of the European Union, receives from the pharmaceutical industry the documentation relative to a new drug with regards to its quality, efficacy and safety. Each dossier is over a hundred volumes and is put together

exclusively by the pharmaceutical industry. The dossier also includes the assessment of an external expert, who however is employed by the pharmaceutical industry and therefore does not guarantee an impartial judgement (1). In the same way, the documentation presented after the product's introduction on the market, with regards to dosage, toxic effects or to include new therapeutic instructions, comes exclusively from the pharmaceutical industry. If the dossier is the object of substantial criticism, the pharmaceutical industry can withdraw the request for approval in order to avoid receiving a negative answer. If the CHMP opposes the commercialisation of a drug, the company can appeal; but it is always the CHMP, not another Committee, that re-examines the dossier even in "appeal".

3. What we know and what we don't know about approved drugs

In the case of a positive answer, the EMA announces it with a short press release. Then, together with the pharmaceutical company concerned, it draws up the EPAR (*European Public Assessment Report*, which summarises the product's characteristics and the methods with which its approval was decided), the SPC (*Summary of the Product Characteristics*, a technical file aimed at the prescribing doctor), and the instructions that are placed inside the packaging to inform the patients (2). Apart from these documents, which are made publicly available, the EMA and all its members – collaborators, consultants, including the members of the CHMP – are sworn to secrecy. It is therefore not possible to directly ascertain if the reasons for approving or rejecting a new drug are in line with the documentation provided by the pharmaceutical industry, because it is not possible to access the original documentation. Similarly, it is not possible to access the files for the collection of individual data on which the results presented by the pharmaceutical industry are based, because generally they are not even communicated to the EMA (3). Despite the improvements in transparency carried out by the EMA, it is still impossible to access the original documents or to know the opinion of the minority, should the CHMP's answer not be unanimous (3).

A different policy is followed by the United States' *Food and Drug Administration* (FDA), which makes available the data relative to all clinical research when they are requested for scientific reasons by groups of academics or by patients or consumers associations; in addition, it communicates the evaluation of the *Advisory Committee* members, who are consulted before elaborating the final opinion (3).

4. Reasons for secrecy

Why does European legislation call for secrecy with regards to EMA activities? Essentially, because it is influenced by the warnings deriving from the interests of the pharmaceutical industry represented in Europe by the EFPIA (*European Federation of Pharmaceutical Industries and Associations*).

The fundamental reason to uphold secrecy is to avoid damaging the intellectual property of the pharmaceutical industry that used considerable financial resources to develop a drug and have it approved. It is true that the pharmaceutical industry owns the patent, states the EFPIA, but divulging

information relative to the data necessary to have it approved would still give an advantage to the competition and therefore it would damage industrial interest and in effect the profits. With lower profits, the pharmaceutical industry would not be able to invest in research in the same way and in the end the patients themselves would be disadvantaged, because there would be fewer products to cure their illnesses (4).

5. Reasons for transparency

This argument, seemingly reasonable, has however many weak points. The idea that research generated with private funds must remain exclusive property of the pharmaceutical industry can be contested for at least three reasons:

(i) The pharmaceutical industry largely draws from research funded by national and international public agencies. Without this primary research it would be much more difficult for the pharmaceutical industry to carry out independently all the research needed as the starting point to formulate development hypothesis for their products;

(ii) Phases 2 and 3 of the clinical research are accomplished only thanks to the availability of the patients, who free of charge agree to undergo clinical trials, often with a personal sacrifice and exposing themselves to the risks associated with having little knowledge of the new products;

(iii) In the majority of European States the use of pharmaceutical products is guaranteed by the national healthcare service or by public insurance. Without public funding few patients would be able to buy medicines, which often have prohibitive costs.

In essence it is clear that, in the development of its products, the pharmaceutical industry benefits from a lot of public help and therefore it is not the only source of the necessary resources; without public contribution the development of drugs would be much more onerous for the pharmaceutical industry.

With regards to the statement that abolishing secrecy would help the competition and damage those who study and produce new drugs, it is necessary to make some distinctions (2). Secrecy concerning the methods of synthesis and production of a drug can certainly be justified, in the same way as the protection of the data relative to the methodologies developed specifically to discover a certain drug must be preserved. However we don't see why it is necessary to hide the methods with which the toxic potential of a drug has been studied at the pre-clinical level. For instance, the data about the mutagenic, carcinogenic, embryo-toxic action as well as the effects on reproduction, on organ toxicity, etc. is information that must be available and verifiable by those - researcher or public interest representative - who have the right to examine the toxic characteristics of products which might be used by millions of patients. There are even less arguments to deny access to information relative to the clinical trials. These are the most important data, as they determine the approval or rejection of a drug. There are no real reasons to believe that the availability of this information can benefit the competition, as it is very unlikely that these data can be of any relevance in producing new drugs, especially if the information is made available after authorising the product. In addition, if all the information was made available, eventual damages and

possible advantages would affect the whole of the pharmaceutical industry and in the end balance each other out. With regards to the damage to patients due to the reduced incentive to research, it is important to remember that the amount of resources the pharmaceutical industry allocates to research is about three times less than what is allocated to advertising. It can therefore be stated that abolishing secrecy in some aspects of industrial research would allow an improvement in research thanks to the possibility of evaluation and criticism by third parties, not involved with those who produce the data and examine them to decide their commercialisation. In addition, seen as the American pharmaceutical system (FDA) allows access to toxicological and clinical data, we don't understand why this is not compatible with the European system (EMA).

6. Clinical trials registers

Another area dominated by secrecy is the possibility of accessing the data relative to clinical trials currently taking place, to avoid on the one hand unnecessary duplications and on the other hand the publication only of the results favourable to the drugs being studied. At present, all drugs' clinical trials in Italy are listed in a national Register at the AIFA and a European Register of Clinical Trials (EudraCT). However, the Register can not even be accessed at the end of the trials and it does not record all the outcomes.

7. What must be changed

The NBC believes that some important changes are necessary to the European legislation, in line with the purposes of biomedical research, which must always be aimed at protecting patients (art. 2 Oviedo Convention) (5).

1. Experimental toxicology data and clinical studies results must be available for reasons of public interest when a drug is introduced on the market. Another body could be responsible for assessing the requests and authorisations to access the documentation available.

2. The activity of the EMA must be more transparent: the original documents, the supervisor's report, the discussion within the CHMP, the minority position should be made available. EPAR and SPC must be drawn up by the CHMP independently, without the influence of the pharmaceutical industry producing the drug. The pharmaceutical industry's appeal in case of a negative answer should be assessed by a body independent of the CHMP.

3. Good progress has been made towards obtaining the registration of the protocols of the drugs' clinical trials. However there are still too many inaccessible registers and it becomes difficult to research current studies and those that have been completed. It would be useful for all registrations to be quickly collected in a global register, accessible to everyone and held by an international body like the WHO.

4. All scientific institutions should sign research contracts that do not forbid the publication of the results and guarantee the immediate communication of any health damaging collateral effects. Ethics Committees with the task of evaluating drugs' clinical trials should have the responsibility of

In conclusion, it is important that scientific institutions and consumers and patients associations are allowed to access all toxicological and clinical scientific data concerning drugs, through an external body that evaluates the requests and authorisations to access the data, so that patients' interests are favoured over industrial interests.

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Presidenza del Consiglio dei Ministri



CRITERIA FOR ASCERTAINING DEATH

24th of June 2010

INTRODUCTION

The opinion *Criteria for ascertaining death* was approved unanimously by the NBC in the plenary meeting of the 24th of June 2010 by those present (Prof. Salvatore Amato, Prof. Luisella Battaglia, Prof. Stefano Canestrari, Prof. Lorenzo d'Avack, Prof. Emma Fattorini, Prof. Carlo Flamigni, Prof. Romano Forleo, Prof. Laura Guidoni, Prof. Demetrio Neri, Prof. Laura Palazzani, Prof. Rodolfo Proietti, Prof. Monica Toraldo di Francia, Prof. Giancarlo Umani Ronchi, Prof. Grazia Zuffa, Doctor Riccardo Di Segni) with the exception of Prof. Lucetta Scaraffia, who voted against it. Prof. Maria Luisa Di Pietro, Prof. Emma Fattorini, Prof. Silvio Garattini, Prof. Aldo Isidori, Prof. Claudia Mancina, Prof. Alberto Piazza, absent from the meeting, expressed their agreement with the document. To explain the reasons for her vote against, Prof. Lucetta Scaraffia drew up a personal remark, attached to this opinion and published with it.

The document was coordinated and drafted by Prof. Lorenzo d'Avack and Prof. Giancarlo Umani Ronchi, with the participation of all the Committee members (in particular with written contributions by Prof. A. Bompiani, Prof. A. Da Re, Prof. M. Gensabella, Prof. D. Neri, Prof. L. Palazzani and Prof. R. Proietti) and after consulting illustrious scholars: F. Procaccio, Complex Structure director of Anesthesiology and intensive care neurosurgery department, Agenzia Ospedaliera Universitaria in Verona; A. Nanni Costa, director of the National Transplant Centre; Doctor P. Geraci, in charge of the donations and transplants coordination Centre, Policlinico San Matteo in Pavia; G. Azzoni, professor of legal and biolegal Philosophy, Law Department, Università degli Studi in Pavia; P. Becchi, professor of Philosophy of Law, Law Department, University of Genova; G. Miranda, professor of Bioethics, Pontificio Ateneo, Regina Apostolorum and R. Proietti, professor of Anesthesiology and reanimation, Università Cattolica del Sacro Cuore, Rome.

The Italian National Bioethics Committee (NBC) tackled the problem of the criteria used to declare human death. It is known that although there is only one death, its diagnosis can today be ascertained with the traditional cardio-circulatory criterion (irreversible cessation of the circulatory and respiratory functions), as well as with the neurological criterion (irreversible cessation of all the functions of the brain, including those of the brain stem). However, both these criteria have caused in the last few decades widespread scientific and ethical debate, also in consideration of the advancement of medical knowledge. The NBC has therefore deemed necessary to carry out a new and in depth discussion, capable also of integrating the document *Definition and detection of human death*, drafted by the same Committee in 1991.

In this document the NBC intentionally kept the problem of ascertaining death separate from that of organ transplants, on the basis of the precise premise that defining and ascertaining death must not have any ulterior motives, in the sense that we must always maintain the principle that declaring death is independent from the eventual removal of organs and from any utilitarian consideration relative to the social-healthcare costs of assisting post-anoxic patients. However, the Committee is aware that the link between them is now part of a widespread social feeling about this topic and that organ transplants, even in this document, must be taken into account especially when the issue is seen in a practical perspective.

After an ample clinical and ethical analysis, which took into account the different and opposing arguments, the NBC concluded that both neurological and cardio-pulmonary criteria are clinically and ethically valid to ascertain the death of an individual and completely avoid any chance of error. In particular the Committee, with regards to the neurological criteria, believes that only those referring to the so-called “whole brain death” and “brainstem death” are acceptable, intended as an organic, irreparable brain damage, developed to an acute stage, which has caused a state of irreversible coma, where artificial support has intervened in time to prevent or treat an anoxic cardiac arrest. The Committee however believes that any explanations of this concept to the public should be corrected and updated especially with regards to terminology, with definitions that are more in line with current clinical practice.

The adopted criteria must also fulfil the condition of rigorously and meticulously respecting the clinical pre-requisites of the methodology, the procedures and the eventual use of verification tests. For this reason we recommend the highest possible uniformity in the protocols, both with regards to the cardio-pulmonary and the neurological criteria, which at the moment seem often different from country to country, causing confusion in public opinion with negative effects on the relative belief in the reliability of the criteria themselves.

In particular, the NBC’s criticism towards the definition of death by cardio-pulmonary criteria, focuses on those protocols, found in other countries, that establish very short times (between 2/5 minutes) to ascertain death. The risk is that the patient could still “be alive”, as the extremely short time elapsed from the cardiac arrest is insufficient to declare the irreversible loss of encephalic functions. The NBC stresses the importance of respecting the “dead donor rule” in the field of donations and in removing organs, which must not translate into the “dying donor rule”.

Finally, the NBC recognises that Italian legislation on ascertaining death, supported by current guidelines, is extremely protective and prudent and has allowed medical institutions to adopt homogeneous practices. However, it recommends to be always open to further analysis of the problem, especially when new or previously overlooked scientific data emerge.

Rome, 10th of July

The President
Prof. Francesco Paolo Casavola

CRITERIA FOR ASCERTAINING DEATH

1. Premise: previous NBC opinion “Definition and detection of human death” (1991)

The National Bioethics Committee, with the opinion *Definition and detection of human death* (1991) already tackled the issue of ascertaining death on the basis of the neurological criteria¹⁷⁶, for a long time considered in many countries as a valid criteria, together with the traditional one (cardio-respiratory).

The document’s conclusion is that, already formulated by the Harvard Commission (1968) and the President’s Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioural Research (1980), of the concept of death defined as “total and irreversible loss of the organism’s ability to autonomously maintain its own functional unit”. It follows that in order to declare an individual “dead”, the Committee believes that it is clinically and ethically acceptable only the so-called whole brain death criterion “intended as an organic, irreparable brain damage, developed to an acute stage, which has caused a state of irreversible coma, where artificial life support has happened in time to prevent or treat an anoxic cardiac arrest”¹⁷⁷.

Therefore, with regards to the problem of ascertaining human death, the NBC accepts, like all western countries even before the 1990s, whole brain death as an additional criterion of death, with all the legal consequences that this implies (interruption of medical treatments, declarations of death, possibility of removing organs, burying the body, succession, etc.).

The NBC’s document at the time proved to be of great importance to the Italian legislators, who, in the Law 578/93 *Regulations to ascertain and certify death*, took it largely into account, establishing in Art. 1 that “Death is identified with the irreversible cessation of all encephalic functions”.

However, we can see how the NBC tackled this issue without discussing the bioethical debate already present in the 1990s, which on the one hand saw the definition of death as a philosophical and moral problem (What is death? What is the meaning and dignity of human life in the condition of absence of conscience and serious cerebral lesion?) and on the other hand doubted the notion of brain death. In addition, the interaction between the different conceptual levels seems fully expressed in the cultural debate and in the many critical contributions of these last twenty years, after the Committee’s document.

This statement deserves further clarifications.

The Committee’s main interest – following the debate that for various reasons was already going on in society at the time – was to make the reader understand the profound distinction that in “real” terms (that is, in the clinical events at the basis of the bioethical evaluation of human death) exists between the expression “brain death” and “whole brain death”, not always used correctly in the philosophical debate and source of great misunderstanding, at least potentially, in the behaviour of the doctors resuscitating an individual.

¹⁷⁶ For an explanation and the meaning of the different terms used to refer to the issue of “brain death” see *ultra* “Glossary”.

¹⁷⁷ National Bioethics Committee, *Definition and detection of human death*, 1991, p. 7.

In addition, few members of the public knew the complexity of the structures of the “central nervous system” (that is, those contained in the cranium) and were aware that from a descriptive-anatomical point of view, the term “brain” is only applicable to the “higher” cortical area (telencephalon) and to the one immediately below it (diencephalon). Therefore, with the expression “brain death” it was to be intended only death caused by an extensive lesion, such that it would lead to the substantial and irreversible loss only of the functioning of the telencephalon/diencephalon, whilst with the expression “whole brain death” it was to be intended the same substantial and irreversible damage also to the central nervous structures below – in the architecture of the central nervous system – the diencephalic structures, that is, the mesencephalon (cerebral peduncles and quadrigeminal plate), the metencephalon (pons and cerebellum) and finally the myelencephalon (medulla oblongata).

The adjective “whole” – applied to the noun “brain” – especially in what has become its common usage in public opinion and in the press to define the concept of encephalic damage, has come to mean a “global” irreversible functional lesion, that is, of all endocranial (encephalic) structures, strictly linked not only by a myriad of nervous connections, but also by an articulated circulatory system.

Proof of the accuracy of this interpretation is the fact that no-one (either in Italy or elsewhere) put the term “whole” before the word “brain” writing “whole brain death”, an expression that would have supported – if it had been adopted – the accusation, already made by some at the time, of ignoring any residual function, a weak electrical signal, of the cortex’s cellular structure, even when the total “brain death” has been declared and verified.

On the basis of the incontrovertible clinical experience of decades, in conclusion, the NBC’s primary interest in 1991 was to stress that a serious endocranial lesion capable of leading to the subject’s death had to cause irreversible effects on the “central nervous system” overall (“whole”), and not only stop cortical functions (“the so-called cortical death”).

The NBC however, to be in line with the international terminology already established for many years, used the term “whole brain death” and not the term “encephalic death”, although it clearly argued to that effect.

Finally, it must be pointed out that a further “proof” of the correct use of the concept of totality is given by Italian legislation (as seen above) in its mention of the irreversible stress that is placed on *all* the possible functions of the central nervous system in the cranium, in order to be able to talk of death ascertained with a neurological method.

With the “legal” expression of encephalous – adopted by the legislator – every possible doubt or misunderstanding of the concept of “brain death” (which, without the descriptive adjective, indicates almost necessarily “cortical” stress) is removed.

2. Reasons for a further NBC reflection

The current Committee felt that it was necessary to carry out a new reflection on this issue in order to integrate the 1991 document, especially in consideration of the progress of medical knowledge, which has produced a

more in depth scientific and ethical debate with regards to ascertaining death with a neurological criterion.

The NBC, in tackling this issue, could not overlook the other criterion for ascertaining death: the cardiocirculatory criterion. This, in consideration of the fact that the same advancement in circulatory reanimation techniques and extracorporeal support require increasingly more accurate tests, which are not limited to a flat line EEG for a few minutes, as it happens – in various European Countries but not in Italy – in different protocols aimed at shortening as much as possible the observation period, due to the growing responsibility of organ removal from donors whose heart has stopped.

In this document the NBC intentionally kept the problem of ascertaining death separate from that of organ transplants, on the basis of the precise premise that defining and ascertaining death must not have any ulterior motives, in the sense that we must always maintain the principle that declaring death is independent from the eventual removal of organs and from any utilitarian consideration relative to the social-healthcare costs of assisting post-anoxic patients. However, the Committee is aware that the link between them is now part of a widespread social feeling about this topic and that organ transplants, even in this document, must be taken into account especially when the issue is seen from a practical point of view.

Finally, the NBC in this second document also reaffirms what the Committee stated in 1991, that is, how in public opinion the scientific criteria in this field are often unknown or badly interpreted so that they cause misunderstandings about the exact definition of death and the identification of the moment when it happens. “Unfortunately, in the widespread scientific debate, the frequent lack of clarity has contributed to raise or perpetuate fears or prejudices about a correct diagnosis of death”¹⁷⁸. These preoccupations are still current today and demand a new in depth study of the issues that can help the eventual reformulation of definitions that are now inadequate, due to the advancement of scientific knowledge and technological applications, and therefore cannot be used in contemporary clinical practice any longer.

3. Ascertaining death with neurological criteria

3.1 A short history

On the 5th of August 1968, “JAMA”, the journal of the American Medical Association, published the Report of the Harvard Committee *A Definition of Irreversible Coma*, which indicated the innovative criteria for defining-ascertaining death, in addition to the traditional cardiorespiratory one. The comatose patient, when not receptive and responsive, was considered to be in a state of brain death if, once the ventilator had been switched off for three minutes, no respiratory activity had taken place, all spontaneous or induced movement had ceased, all reflexes had stopped, including those of the spinal cord and the EEG line did not show any electrical activity¹⁷⁹.

The document caused a lot of criticism: first of all, because of the lack of reference to any primary pathology that would have caused the irreversible

¹⁷⁸ National Bioethics Committee, *Definition*, cit., p. 10.

¹⁷⁹ This test was completely abandoned after a year, as more in depth considerations led to the conclusion that the clinical examination was in itself sufficient for the diagnosis.

coma and its possible interference with the prognosis and the eventual reversibility of the coma. Expecting the ending of *all* reflexes seemed unwise and confusing, although mitigated by the statement that there could be spinal reflexes, in particular the cutaneous plantar one. Then, the demand that all encephalic structures be destroyed and all functions interrupted was highly questionable, as the proposed criteria were not capable of exploring all of them. Finally, the Committee's statements seemed to some *mostly theoretical* because unsupported by scientific references directly expounded in the text, or – on the basis of the “clinical trials” criteria – evaluated with observations able to confirm, also from a predictive point of view, the validity of the thesis being advanced, despite the fact that clinical experts were part of the Committee¹⁸⁰.

After the Harvard document, some States in the USA started using neurological standards and criteria to ascertain death, others continued with the traditional methods. The American historian M.S. Pernick identified a lot of confusion in the interpretation and application of the Harvard criteria, not only by doctors but also by judges¹⁸¹. Determining death could be dependent on geography because of the criteria used: patients who died in one State could be considered still alive if moved to another State.

Amongst the most authoritative attempts at scientifically justifying the Harvard document, there is one presented at the beginning of the 1980s by the American neurologist James Bernat, together with his colleagues Charles Culver and Bernard Gert.¹⁸² Their work was important to pave the way for the following scientific justifications of the notion of brain death and put forward an exclusively biological definition of death through the so-called theory of the “central integrator”.

In 1980 the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioural Research was created in the USA, and a year later published the document *Uniform Determination of Death Act (UDDA)*¹⁸³ with the aim of bringing uniformity to the definition of death and giving medically-biologically adequate answers.

According to the Commission “the individual who has sustained either irreversible cessation of respiratory and circulatory functions, or irreversible cessation of all functions of the entire brain, including the brain stem, *is dead*. A determination of death must be made in accordance with accepted medical

¹⁸⁰ On the other hand, it's true that at the basis of this statement there were international scientific experiences fixed over decades, amply consolidated although not cited by the Committee: thanks to P. Mollaret and M. Goulon' studies on the coma *de passe* (*Le coma dépassé. Memoire préliminaire*, in “Revue Neurologique”, 1953, 101, pp. 3-15) and M. Jouvett studies on the nervous system (*Diagnostic électrosouscorticographique de la mort du système nerveux centrale au cours de certains comas*, in “Electroencephalography Clinical Neuropsychology”, 1959, 3, pp. 52 ss.;) to the outcomes of two very important conventions: the Ciba Foundations one in 1966 and the American Collge of Physicians one in 1967, to the experience of numerous surgeons operating in this field. In addition, there had been a heart transplant carried out in 1967 by Barnard, a heart transplant carried out in Europe by Prof. Cabrol a few months before the Harvard declaration, and the Jeanneney circular that defined brain death. Only in 1977 a research supported by the National Institute for Health was published, which confirmed the thesis of the Harvard Committee.

¹⁸¹ M.S. Pernick *Brain death in a cultural context. The reconstruction of death, 1967-1981*, in S.J. Youngner, R.M. Arnold R. Shapiro (eds.), *The definition of death. Contemporary controversies*, Baltimore-London 1999.

¹⁸² J.L. Bernat, CH. Culver, B. Gert, *On definition and criteria of death*, in “Annals of Internal Medicine”, 1981, XCIV, 3, pp. 434 ss.

¹⁸³ *Defining death: A report on the medical legal, and ethical issues in the determination of death*, Washington, D.C. 1981.

standards". Therefore, the Commission identified as brain death, the death of the whole encephalous (*whole brain death*), considered to be the critical organ for corporeal integration. The irreversible cessation of all cerebral functions meant the irreparable loss of the integration of the various components of the organism and consequently the death of the individual. The Commission moved from the conviction that the notion of whole brain death was coherent with tradition, as this was not a radical change of the concept of death, but only the consequence of technological progress, which had made available to medicine more reliable instruments to measure the loss of cerebral functions.

This judgement was accepted, although with some marginal changes, in the legislation of the majority of European countries, with the exception of Great Britain. In this country medical associations are in favour of a definition of death that identifies it with the irreversible loss of consciousness and breathing, the necessary condition of which, from a physiopathological point of view, is the necrosis of the brainstem. It has been highlighted that the physio-pathological contradiction between the concept of death based on "whole brain death", which includes the brainstem, and the one accepted in Great Britain based on the necrosis of the brainstem, is only apparent. "The irreversible loss of the capacity for waking consciousness, associated with the loss of spontaneous respiration constitute the common essence of the two concepts and summarise their *core* physio-pathology of death, clearly distinguishing it from any other clinical situation"¹⁸⁴.

3.2. Criticism

It is necessary to remember that in those same years in the UDDA document, and then subsequently, doctors with different specialisations, philosophers and jurists, with a variety of cultural and anthropological leanings, raised objections about the reliability of the notion of "brain death", believing that this criteria is a "conventional" solution, as it is functional to the need of finding organs for transplant purposes. A criticism that is still raised today and that has forced quite a few ethics Committees and medical associations to come back to the issue.

a. The scientific point of view

There are those who state that there is no adequate basis for a scientific justification in favour of neurological criteria for the identification of death.

The main scientific and clinical criticism regards two aspects that – on the contrary – had been identified by the President's Commission as the fundamental reasons to consider the neurological criteria of death, valid.

The first criticism is aimed at the so-called irreversible loss of all functions, which would be present when whole brain death is declared. The second is aimed at the "permanent cessation of the functioning of the organism as a whole" and at the idea of assigning to the brain the role of giving an organic direction to all the functions that make up the organism of each living being.

¹⁸⁴ Centro Nazionale Trapianti, *Determinazione di morte con standard neurologico. Elementi informativi essenziali*, 2008, p. 14.

With regards to the first, it is important to recall the Article published in 1992 by doctors D. Truog and James C. Fackler¹⁸⁵, which enumerates – on the basis of medical research documents - the reasons why patients considered death on the basis of neurological tests do not necessarily show the irreversible loss of *all* cerebral functions. In proof of this statement, they cite some cases in which patients declared brain dead show a variety of functions: the endocrine-hypothalamic function and in particular the hormonal activity of the neurohypophysis and the hypothalamus which controls it; an electrical activity, although weak, which can be found in some areas of the cerebral cortex; finally, spinal reflexes. On this basis, the Authors believe that the current clinical tests used to ascertain the irreversible cessation of all encephalic functions are not able to do so and demonstrate, consequently, that the neurological criteria of death based on some clinical tests adopted in various protocols is unreliable.

A critical argument that is repeated also in the scientific literature which followed the cited Article.

With regards to the second criticism, not only the American neurologist D. Alan Shewmon¹⁸⁶, but also other neurologists and anesthesiologists state that the encephalous is not the organ responsible for the integration of the different corporeal parts which make the organism an organised and functioning unit. The body's "critical system" or "core integrator" cannot be found in a single organ, even an important one like the encephalous¹⁸⁷. The neonatologist Paul A. Byrne states that the encephalous is not made up of one part, but many parts that are closely correlated (cortex, cerebellum, mesencephalon, brainstem, spinal cord, etc.). From this statement follows that the encephalous does not have a function that can be physiologically identified, or functions that can be accurately called "vivifying function or functions". "Rather, there exists – writes the author – a large multiplicity of different functions that are characteristic of the different parts. Although the characteristic functions of the brain-parts normally are closely coordinated, the parts have different functions that often cannot be carried out without the other parts. Further, none of these parts is in complete control of the others"¹⁸⁸.

From a medical point of view, the organism of a person believed to be brain dead, according to neurological criteria, is practically kept alive "as a whole" by using technologies that substitute cardiac and respiratory functions. The individual organs stay interconnected and alive, just like transplant medicine demands they are. There are no signs of deterioration, we cannot see an increase in the disorganisation of the body's organs, tissues and cells. On the contrary, we observe a considerable order, coordination and integration: the spinal cord, temperature control, blood circulation, metabolism, immunological

¹⁸⁵ R.D. Truog, J.C. Fackler, *Rethinking brain death*, in "Critical Care Medicine", 1992, XX, 12, pp. 1705 ss.; additionally R.D. Truog, *Is it time to abandon brain death?*, in R. Barcaro, P. Becchi (eds.), *Questioni mortali. L'attuale dibattito sulla morte cerebrale e il problema dei trapianti*, Napoli 2004, pp. 205 ss.; Id., *Organ transplantation without brain death*, in "Annals of the New York Academy of Science", 2000, 913, pp. 229 ss.; Id., *Role of brain death and the death-donor rule in the ethics of organ transplantation*, in "Critical Care Medicine", 2003, XXXI, 9, pp. 2391 ss.

¹⁸⁶ D.A. Shewman, "Death of the cerebral trunk", "brain death and death": a critical re-examination of their perceived equivalence, in Barcaro, Becchi (eds.), *Questioni mortali*, cit., pp. 177-204.

¹⁸⁷ *Ivi*, pp. 197 ss.

¹⁸⁸ P. A. Byrne, *Death: the absence of life*, in R. De Mattei(ed.) *Finis vitae. Is brain death still life?*, Soveria Mannelli 2007, p. 85.

system and the gaseous exchange in the lungs, work. Pregnant women are even able to deliver the baby. And this shows the presence of very complex interactions between numerous organs (heart, lungs, liver, kidneys, etc.), which, in this perspective, is evidence of integration¹⁸⁹.

Additionally, it must also be recalled that the source of life might not be the brain but the heart. The neurocardiologist John A. Armour stresses how in the last few decades there has been an accumulation of proof in favour of a “functional brain” of the heart, able to satisfy the body’s daily needs. In addition it is said that the heart, with its internal nervous system, is capable of processing the information coming from the internal organs as well as centripetal information (directed to the brain) and centrifugal information (coming from the brain), in order to maintain the internal *milieu* and this represents a new perspective from which we can understand in more depth the human body as a whole¹⁹⁰.

From these observations and interpretations (although not fully shared by the majority of the scientific community) Armour arrives at a first conclusion: only the interruption of life support leads the patient rapidly to death. This situation should be distinguished from that identified as whole brain death, as it precedes it. These are situations with different peculiarities. After the so-called “total” brain damage or lesion, a man is near death: he is dying. Some cerebral functions remain and the integration capability, although diminished, is still present: these signs are believed to be respectable manifestations of human life. In this state it is therefore not appropriate to declare a human being dead and to treat him like a corpse. This will be possible only when the “characteristics of death” become evident, that is, when all cerebral functions will cease and the organism will start to disintegrate. But these characteristics are not reliably indicated, from this point of view, by the criteria of brain death¹⁹¹.

If therefore a widespread conviction is possible, that the brain of the patients in that particular condition is irreparably compromised, as a result of the trauma suffered or of the progress of the pathological process that caused the brain damage, – according to this perspective – a residual life is not excluded.

Edmund D. Pellegrino, the then President of the American Council on Bioethics, makes this idea explicit: “When a ventilator supports the body’s vital functions, this technological intervention obscures our view of the phenomenon. What seem to be signs of continued life in an injured body are, in fact, misleading artifacts of the technological intervention and obstacles to ascertaining the truth. To consult brain-based functions, then, is to look through a “second window” in order to see the actual condition of the body”. And it is precisely the rejection that there is a reliable “second window” of the phenomenon of death, in the abovementioned perspective, which is the object of criticism at the scientific level. “If its presence is not made known by the

¹⁸⁹ R.. Beckmann, *Ascertaining death: is cerebral death reliable?*, *ibidem*, cit., pp. 46 ff.

¹⁹⁰ J. A. Armour, *The heart of the question*, *ibidem*, p. 3 ff. In reality, the issue of an *autonomous characteristic* of the electric stimulation of the heart’s contractility – through the “bundle” of HIS and the atrioventricular node conductor - has been known for a long time, but just as known is the functional adjustment (already starting in embryonic life) of the heart’s contractility in its different parameters through antagonistic, balanced, sympathetic and parasympathetic innervation.

¹⁹¹ Beckmann, *Ascertaining death*, cit., p. 47.

signs that have always accompanied it – breathing lungs and beating heart – then there is no way to state with confidence that death has occurred”¹⁹².

b. At the philosophical level

On the basis of the scientific criticism to the criteria of whole brain death, philosophical criticism has been added and integrated.

Well known are the objections advanced by Hans Jonas, since the end of the 1970s, towards the Harvard Commission. Jonas stresses how we must not expect a knowledge of the object that is more precise than what the object itself allows. From this perspective, the definition of death would be affected by a congenital flaw of error and impropriety: wanting to define with certainty something that, for its own nature, cannot be defined precisely¹⁹³. At the root of the new definition of death – according to the A. – there are two “practical reasons”: on the one hand freeing the patients, the relatives and the healthcare structures from the burden of caring for an indefinitely prolonged coma; on the other hand avoiding ethical problems and controversies about the removal of organs. Both reasons cannot justify the definition itself, as they function not on the level of scientific knowledge, but on that of practical interest, which places the suspicion of exploitation on the definition itself.

Jonas believes that the theoretical definition in itself cannot have, not even in light of the new scientific knowledge, a rational justification. The death of the brain cannot be identified with the end of the organism’s integration: in fact, not only local subsystems continue to function, but respiration and blood circulation, although supported artificially, also carry on, the activity of which extends to the whole system and ensures the preservation, both functional and substantial, of all the other parts. Therefore, although presented as an eminently scientific problem as a broadening of medical knowledge, the movement from the traditional definition of death (cessation of the cardio-respiratory activity) to the following neurological one is for the German philosopher an option dictated fundamentally by practical interests, left to doctors and then accepted by the law. The correct question is not: “Is the patient dead?” but “what can we do with him”, who is still a patient? And this question cannot be answered with a definition of death, but with a definition of man.

The criticism and the doubts raised by Jonas, initially overlooked, were given growing attention from the beginning of the 1990s by some Catholic philosophers.

Josef Seifert moves from an ileomorphic metaphysical idea that identifies in the human being the presence of body and spiritual (rational) soul: in his opinion the human being ontologically transcends the sum of the parts that constitute the body, as an integrated organism. The cessation of the physiological and biological integration coincides with the death of the vegetative soul; the cessation of conscience with the death of the sensorial soul; only the “complete and irreversible cessation of all vital signs (including cardiorespiratory activity and total brain infarction)”¹⁹⁴ is evidence of an

¹⁹² *Controversies in the determination of death: A white paper by the President's Council on Bioethics*, Washington, December 2008 (www.bioethics.gov)

¹⁹³ H. Jonas, *From ancient creed to the technological man, Philosophical essays*, Englewood Cliffs, New Jersey, Prentice-Hall, Inc. 1974, pp. xviii, 349.

¹⁹⁴ J. Seifert, *On “cerebral death” in short. Philosophical arguments in favour and against the equivalence between cerebral death and real death*, in De Mattei (ed.), *Finis vitae*, cit., p. 272;

individual's death. The Author believes that the philosophical premises (unjustified in his opinion) of the notion of brain death are an empirical reduction of the human body to biological life, the functional reduction of the human being to his actions and capabilities (therefore to consciousness and rationality) and the identification of the brain as the absolute embodiment of the soul. According to Seifert, even if there was still a doubt, as there is no objective moral certainty of the death of an individual through the observation of brain death, we should tutioristically abstain from actions that could be homicides¹⁹⁵.

Robert Spaemann, in the context of the same ileomorphic perspective, believes that, as the human being cannot be ontologically reduced to the function of thinking and to the brain as the organic condition of thinking, his death cannot coincide with the cessation of cerebral functions, but it must be identified with the cessation of all vital functions (including the cardio-respiratory ones)¹⁹⁶.

This idea has been accepted by the jurist John M. Finnis, who felt that, from a Christian point of view, identifying brain death with a person's death is not justifiable¹⁹⁷.

Although he starts from anti-metaphysical and utilitaristic philosophical premises, Peter Singer also expresses a criticism of the concept of whole brain death, using arguments similar to those put forward by Jonas¹⁹⁸: the decision to abandon the traditional definition of death and opt for a new definition in terms of brain death, moved from ethical and non-scientific motivations. The Australian philosopher stresses that the definition of brain death is a definition which tries to overcome the obstacle of removing a beating heart, by declaring that the patient in that condition is already dead. Like Jonas, Singer is not convinced by the theoretical reasoning underlying the definition of brain death, namely, the thesis that the death of the brain and the death of the organism as a whole coincide. The organism's integration can continue, if properly supported with coordinated intensive therapy procedures, even in the brain dead patient. We must re-think the current notion of death from an anthropological and ethical point of view, keeping clearly separate two issues: "when is a human being dead?" and "when is it legitimate to interrupt the artificial treatment and/or intervene on his body?"

However, despite some analogy of arguments and the shared criticism of brain death, there are considerable differences about the behaviour due to the individual in a state of whole brain death with regards to transplants. The

Id., *Is "brain death" actually death? A critique of redefining man's death in terms of "brain death"*, in R.J. White, H. Angsturm, I Carrasco De Paula (eds.), *Working group on the determination of brain death and its relationship to human death*, Città del Vaticano 1992, pp. 95-143.

¹⁹⁵ J. Seifert, *Is "brain death" actually death?*, in "The Monist", 76, 2, 1993, pp. 175 ss.; Id., *Cerebral death and real death. Philosophical arguments*, in Barcaro, Becchi (ed.), *Questioni mortali*, cit., p. 95.

¹⁹⁶ R. Spaemann, *Is cerebral death the human being's death? The current debate*, in De Mattei (ed.), *Finis vitae*, cit., p. 333 ss.; also in Pontificia Academia Scientiarum (ed.), *The signs of death, The Proceedings of the Working Group 11-12 September 2006, Scripta Varia*, Vatican City, 2007, pp. 130 ss.

¹⁹⁷ J.M. Finnis, *For an ethics of equality in the right to life. A comment for Peter Singer*, in Barcaro, Becchi (eds.), *Questioni mortali*, cit. pp. 123-39.

¹⁹⁸ P. Singer, *Rethinking life and death. The collapse of our traditional ethics*, New York-Oxford 1994 and P. Becchi, *Un passo indietro e due avanti. Peter Singer e i trapianti*, in "Bioetica", 2002, 2, p. 227 ss.

authors who move from the ileomorphic notion see the rising, behind the debate on ascertaining death, of the threat of *euthanasia* through the suppression of living individuals declared *non-persons* following their whole brain death¹⁹⁹.

From Singer's point of view, which is shared by others, the weak ethical and scientific basis of the current definition of death as death of the entire brain and the utilitarian premises already found in the Harvard report (the importance for the community of defining death in practical terms), lead to the belief that it is more convenient, as well as morally justified, to conventionally fix, as the key moment of the process of dying, the loss of consciousness, determined by the so-called cortical death (instead of whole brain death), starting from the notion that we can reduce a person to his manifestation of rational capabilities. Taking for granted that these would not be "corpses", Singer therefore believes that it is morally legitimate to proceed with the removal of organs when cortical death has been ascertained without the shadow of a doubt²⁰⁰.

The neurologist Carlo Alberto Defanti also highlights the difficulty of whole brain death and the problem of considering dead an individual in a body that is still biologically alive²⁰¹. Some jurists hold similar viewpoints. Ubaldo G. Nannini asks himself whether "from an ethical and then legal point of view an extreme space of suspended existence between life and death is better and less risky than forcing its qualification with a positive definition of death"²⁰². Further, Paolo Becchi states: "I believe that the time has come to overcome not only the definition of *whole brain death* but any definition of death in neurological terms (...). The troubling problems posed by patients in a state of brain death or in a persistent vegetative state have a profoundly ethical and legal nature and cannot be resolved with an allegedly scientific definition of death (the definition of brain death for those in a state of brain death, that of cortical death for those in a permanent vegetative state)"²⁰³.

This does not mean that these authors exclude the possibility of: a) suspending all life support measures unable to benefit the patient; b) believing that it is legitimate to remove organs with the individual's explicit or implicit consent, when he has irreversibly started the process of dying.

3.3 The possible consequences

In the face of this criticism, three different lines of thought generally take shape:

- abandoning any definition of death in neurological terms and going back to the traditional definition of death based on the interruption of breathing and blood circulation;

- considering *whole brain death* as a still valid criteria, although needing the reformulation of its definition, supported by scientific reasons and philosophical arguments that can justify it;

¹⁹⁹ In contrast, Jonas' preoccupation is that the patients in an irreversible coma become organ warehouses or object of experimentation.

²⁰⁰ P. Singer, *Rethinking life*, 2000, pp. 64 ff.

²⁰¹ C.A. Defanti, *Soglie. Medicina e fine della vita*, Torino 2007, pp. 205-206; ID., *La morte cerebrale come paradigma della bioetica*, in BARCARO, BECCHI (edited by), *Questioni mortali*, cit., pp. 231-250.

²⁰² U.G. Nannini, *Valore della persona e definizione legale di morte*, Padova, 1996, p. 112.

²⁰³ P. Becchi, *Relazione presentata all'Assemblea plenaria del CNB il 25.09.09*, p. 6; ID., *La morte nell'età della tecnica. Lineamenti di tanatologia etica e giuridica*, Genova, 2002.

- giving greater importance to those functions of the brain that support the phenomenon of conscience and stating that individuals who have permanently lost their consciousness are dead; an approach known as “higher-brain criterion”²⁰⁴.

3.4 The arguments in favour

In the face of this criticism to the neurological criteria of death, the NBC has felt it necessary to listen to the opinion of neurologists, anaesthetists, ethicists and jurists and to take into consideration the content of a number of recent documents about ascertaining death with neurological criteria, in order to draw from them essential information²⁰⁵.

a) With regards to scientific criticism

a.1. On the irreversible loss of all brain functions

Even the supporters of the validity of the neurological criteria of death accept that correct clinical experience, also when involving mechanical instruments, in some cases can highlight some “residual” encephalic functions in the condition of brain death. These are “islands” of cerebral activity, mostly verifiable exclusively with investigations by instruments, but which can coexist with the loss of all possible brain functions. The eventual permanence of metabolically active cells within the cranium does not invalidate the concept of death of the individual. These functions, maintained thanks to an artificial breathing and therefore circulatory support, are considered conceptually similar to some functions which manifest themselves just after death by cardio-circulatory arrest (growth of hair, nails, etc.)²⁰⁶.

²⁰⁴ SINGER, *Rethinking*, cit

²⁰⁵ The following were consulted: Doctor F. Procaccio (Complex Structure director of Anesthesiology and intensive care neurosurgery department, Agenzia Ospedaliera Universitaria in Verona); Doctor A. Nanni Costa (director of the National Transplant Centre); Doctor P. Geraci (in charge of the donations and transplants coordination Centre, Policlinico San Matteo in Pavia); Prof. G. Azzoni (professor of legal and biolegal Philosophy, Law Department, Università degli Studi in Pavia); Prof. P. Becchi (professor of Philosophy of Law, Law Department, University of Genova); Prof. G. Miranda (professor of Bioethics, Pontificio Ateneo, Regina Apostolorum) and Prof. R. Proietti, member of the NBC (professor of Anesthesiology and reanimation, Università Cattolica del Sacro Cuore, Rome).

The documents taken into account are: Centro Nazionale Trapianti, *Determinazione di morte*, cit.; Pontificia Accademia delle Scienze, *Perché il concetto di morte cerebrale è valido come definizione della morte. Dichiarazione da parte di neurologi e altri e Risposta alle obiezioni*, Città del Vaticano 2008; President's Council on Bioethics, *Controversies*, cit. and P. Geraci, G. Azzoni, *Prelievo di organi da donatore a cuore non battente. Protocollo Alba*, 2005. In addition, the most recent bibliography on this topic has been taken into consideration.

²⁰⁶ Centro Nazionale Trapianti, *Determinazione*, cit., pp. 3-4; cf. also G. Miranda, *Relazione presentata all'Assemblea plenaria del CNB del 25 settembre 2009*; R. Proietti, *La diagnosi clinica di morte: sua evoluzione* and the NBC's plenary consultation of the 30th of October 2009; C. Manni, *A Report on cerebral death*, in J.D.D. Vial Correa, E. Sgreccia (edited by), *The dignity of the dying person*, Proceeding of the Fifth Assembly of the Pontifical Academy for Life (Vatican City, 24-27 February 1999), Città del Vaticano, 2000, p. 115 and *L'accertamento di morte*, in R. Poli (edited by), *Ai confini della vita, 1, Corso di formazione in bioetica*, Milano 2008, pp. 246 ss.

Also the ability to continue a pregnancy in brain dead women is believed not to be proof that the death is reversible, therefore not to be proof of life: “The mother's uterus and her other organs are supported as a technical vessel for the pregnancy in a way that is similar to what is

It is also explained that analgesic and anaesthetic drugs are administered to the corpse (in view of the organ removal), because artificially maintaining the cycle is functional to the oxygenation of organs and tissues, including the spinal cord. This allows the preservation of a very low level of activity which however, in the absence of higher control encephalic functions, is capable of unexpected and paradoxical manifestations (at the minimum stimulus corresponds at times a very strong vegetative reaction: tachycardia, arrhythmia, hypertension, etc.). These phenomena are not the individual's vital signs, but are triggered by an elementary reaction in the spine. The drugs used in procedures of organ removal do not have, therefore, the aim of eliminating pain, but of avoiding phenomena like bleeding or movements (spinal reflexes) which can hinder the removal.

The document by the National Transplant Centre states that all the cases published and the clinical experience of "hundreds of thousands of cases" in these first forty years of application of the Harvard criteria, confirm that, despite the possible presence of a minimal intracranial residual activity and the permanence of some physical functions due to the support given to breathing and circulation during a prolonged reanimation, "no recuperation of brain functions is possible, the loss of which is therefore irreversible".²⁰⁷ Consequently, what matters is not whether some cells or limited islands of encephalic nervous tissue remain alive, but whether the encephalous carries out or can carry out its coordinating functions for the body. As Gonzalo Miranda explains: "There is no need for all brain cells to be dead in order to determine the death of an individual, even with cardio-respiratory criteria. In fact, they can survive even some hours after death by cessation of heartbeat, some cells of the hypothalamus (as we can see from the absence of diabetes insipidus) or of the cerebral cortex (as we can see from some isolated electrical activity or from the possibility of cultivating living neurons taken from individuals declared dead by cessation of heartbeat some hours previously)"²⁰⁸.

a.2. The encephalous as the supreme organ coordinating the whole organism.

In reality, there's no denying that, as demonstrated by current clinical experience in reanimation, intensive care techniques (support with breathing and blood circulation) can replace even for months the loss of encephalic functions. The supporters of the neurological criteria accept that from the point of view of terminology, the expression "whole brain death" should be reformulated, if we want to give it the implied meaning that the encephalous is the organ that has the exclusive ability to integrate all organs and functions. But this does not invalidate at all, from a clinical point of view, the individual's state

done to keep the heart or kidneys perfused" (Centro Nazionale Trapianti, *Determinazione*, cit., p. 45). The NBC believes that reducing maternity to a mere mechanical gestation and the uterus to a mere vessel is, in any case, a bioethical problem; although it recognises that the woman's body, in this case, is a corpse, and blood circulation is maintained for the only purpose of allowing the foetus to be born. It must also be mentioned that the legal certification of death follows the baby's birth, even when the death has been ascertained with neurological criteria. The understandable delay in the certification of death to the moment of giving birth, cannot translate in a lack of respect (from an healthcare but also linguistic point of view) for the woman's body which is already a corpse (as she is brain dead), but still "mother".

²⁰⁷ Centro Nazionale Trapianti, *Determinazione*, cit., p. 6.

²⁰⁸ *Relazione*, cit. Similarly Pontificia Academia Scientiarum (ed.), *The signs of death*, cit., c. XXXIII.

of death, seen as life does not reside exclusively in the encephalous²⁰⁹. What we find is that the cessation of all encephalic “critical” functions (namely, the functions that guarantee coordination) leads to the cessation of the organism as a whole. We stress that, despite the criticism, the progress in our knowledge of the mechanisms of the brain confirms that the body is directed “by that marvellous organ that is the brain” and that this must be seen as the receiving centre of all sensory, cognitive and emotive experiences, so that it acts “as the neuronal central motor of existence”²¹⁰.

Therefore, a critical position is taken towards Shewmon, who tried to prove that the integration and coordination of all physical sub-systems are not carried out exclusively by the brainstem and the hypothalamus²¹¹. “It is unclear – says the document by the Pontificia Accademia delle Scienze – which sub-systems Doctor Shewmon is referring to; the rare individuals who are brain dead, but whose organs survive for weeks or months demonstrate that some organs, like the kidneys and the digestive system, can function independently from the brain, but whether they can integrate each other is less clear. On the contrary, as some reports demonstrated, if the technical support is adequate, it is possible to maintain some organs (e.g. the heart) for days, isolated from the body in a system of perfusion”²¹². Eventual “integrative sub-systems” of the rest of the body are few, fragile and scarcely coordinated, and they are impossible to sustain once the brain is dead. With regards to this, it has been observed that “it is better to make a distinction between integration and interaction”. Different cells, organs, and systems interact with each other, sending and receiving messages and reacting according to the signals received. “This happens in the living organism, but it can also happen in a body that is already dead and as long as it is oxygenated by mechanical ventilation, some of its tissues, organs and systems still continue to work, receiving messages from each other and reacting autonomously to those messages. We could even find this same interaction outside of the body, if we maintained a connection between still functioning organs (...). This interaction has nothing to do with the concept of integration of an organism as a living unit”²¹³.

From a clinical point of view these concepts have been mentioned in the document by the National Transplant Centre, in which it is highlighted how in ascertaining whole brain death, verification tests rarely show the presence, even residual and temporary, of cortical electrical activity and the basic perfusion of the cerebral vessels (particularly in the presence of direct and exclusive lesions of the brainstem). And when this happens, these patients are not considered dead. “On the other hand, the tests demonstrate without a shadow of a doubt, through very detailed and refined *imaging*, the complete absence of a cerebral hematic flow which represents at its best, both in physiopathology and communication, the simple concept of “decapitation” of the individual as the basis to ascertain death”²¹⁴. The criticism aimed at the data of the “permanent cessation of the functioning of the organism as a whole” regards especially the definition of death as the permanent interruption of

²⁰⁹ Procaccio, consultation, cit., and MIRANDA, *Relazione*, cit.

²¹⁰ Pontificia Accademia delle Scienze, *Perché il concetto*, cit., p. 47.

²¹¹ A.D. Shemon, *The brain and somatic integration: insights in to the standard biological rationale for equating brain death with death*, “Journal of Medicine and Philosophy”, 2001, 26/5, pp. 457 ss. and “*Morte del tronco cerebrale*”, cit.

²¹² Pontificia Accademia delle Scienze, *Perché il concetto*, cit., p. 50.

²¹³ Miranda, *Relazione*, cit.; similarly Proietti, *La diagnosi*, cit.

²¹⁴ Centro Nazionale Trapianti, *Determinazione*, cit., p. 5.

encephalic activity and not so much the biological consequences of an anatomic situation that is equivalent to a real decapitation. And we have wondered whether a person without a head is still alive if the body is kept functioning with reanimation techniques²¹⁵.

The supporters of the validity of these criteria, however, stress the need for a complete clinical examination and the apnea test, with a standardised and rigorous methodology, in order to exclude extreme situations, described in literature as “almost total damage” of the brainstem. Control standards that are even more indispensable in neonatal and paediatric medicine because of the particular anatomical and physiopathological characteristics of the encephalous and the cranium in children below the age of five.

It is indispensable to be accurate: in fact, it is said that the majority of arguments against brain death are based on the erroneous or imprecise application of the brain death criteria to acts or events, or on the bad interpretation of the data of neurological examinations. Even the lack of uniformity in the criteria for ascertaining death adopted by the different specialist groups is used as argument against neurological criteria.

But another fundamental clinical data must be taken into account in favour of the neurological criterion: the irreversibility of this state of death. The complete necrosis of the brainstem and of the cortex implies the total and irreversible loss of spontaneous respiration and consciousness. These two data differentiate it in an exact, reliable and accurate manner from any other clinical situation of “cerebral lesion”, even the most serious and compromised, that is not total and irreversible. Although neurosciences progress, they do not today allow us to foresee the possibility of coming back after the specific moment of the cessation of all encephalic functions²¹⁶.

b) With regards to philosophical criticism

According to the perspective prevalent in philosophical anthropology, whole brain death is believed to be a valid criterion as it is a sign of the cessation of life in the human organism. The presence of the organism is a necessary condition, although not sufficient, to be able to talk about human being: therefore the cessation of vitality in the human organism is a sign of the death of the individual. And the organism is alive not because its parts are alive (cells, tissues, organs) or the interaction between the parts, but because it works as a “whole”, which is more than the sum of its constituting parts²¹⁷. The presence of some limited encephalic functions or some biological activity of its parts, as well as the persistence of signs of interactions between the parts, does not indicate the presence of integration or coordination.

Also according to the supporters of the ontological-metaphysical perspective, the fact that the encephalus is scientifically considered the switchboard of the organism (and therefore the irreversible lesion of it is condition for the organism’s disintegration) does not mean – according to the supporters of the metaphysical point of view – the reductionist and functionalist identification of the individual with his/her brain, just as ascertaining death with the parameters of cardiac and respiratory activity cessation do not mean the identification of man with his heart and lungs. The encephalus is identified as the organ that manages organic integration, the cessation of which causes the

²¹⁵ Proietti, *La diagnosi*, cit.

²¹⁶ Centro Nazionale Trapianti, *Determinazione*, cit., p. 6.

²¹⁷ F. D’Agostino, *Bioetica nella prospettiva della filosofia del diritto*, Torino 1996, p. 186.

“disintegration” of the organism, therefore of the human being. The individual dies not before or after the death of the human organism, but “with” the death of the human organism. The death of the human organism identified with brain death is the empirical evidence (which can be observed directly with a clinical investigation) of the ontological breakdown of the individual unit (ontological death is not directly accessible to the senses, but we can observe its signs and effects through clinical assessment criteria of the death of the organism), as there is a convergence between the life of an individual and the existence of the corporeal organism²¹⁸. Death exhibits the cessation of the organism’s autopoietic capability, the ability to maintain its own functional and psychosomatic unit.

The premise that death occurs because of the loss of the “organism’s fundamental functioning” to justify the validity of neurological criteria has been accepted also by the President’s Council on Bioethics in the United States in the abovementioned document *Controversies in the determination of death*.

The traditional ileomorphic perspective that implies the identification of the soul with the ontological form of the body is compatible with the identification of the organic physiological unit with the encephalus. If the whole of the different parts (listed above) that make up the encephalus (which common language identifies as the brain) ceases to guarantee the functional unity and the integration of the organic body, the body is not alive anymore, that is, from this point of view it is no longer able to be vivified by the soul. The language of metaphysics and ontology is also preoccupied with highlighting the inevitable mystery of death and the difficulty of identifying precisely the moment in which it becomes irreversible; in the meantime, this language and even more the language of religious faith express the conviction that beyond death there is still a spiritual element of man. However we cannot ask science what death is and what is its existential significance for man; at most we can ask science what are the signs that can be associated more confidently with death. The signs identified by science to ascertain the loss of the organism’s integration by observing the cessation of encephalic activity are believed to be necessary and sufficient to determine the individual’s death, identified with the disintegration of the unit and the “separation of the individual’s vital source, or soul, from his/her corporeal form”²¹⁹.

3.5. The position of the NBC

Despite the scientific and philosophical criticism against whole brain death (encephalic death), the NBC believes that the neurological criterion has biological and moral validity.

Whole brain death means the irreversible interruption of all brain activity (hemispheres and brainstem). When it is proven that the encephalus has totally and irreversibly lost its activities and functions, we can say that the individual is dead, because the organism has ceased to exist.

²¹⁸ M.P. Faggioni, *La vita nelle nostre mani. Corso di bioetica teologica*, Torino 2004, pp. 194 ss.

²¹⁹ E. Sgreccia, *Manuale di bioetica. Fondamenti ed etica biomedica*, vol. I, Milano 2007, p. 845; G. Cottier, *Discussion on Prof. Spaemann’s Paper*, in Pontificia Accademia Scientiarum, *The signs of death*, cit., p. 143; Pontificia Accademia delle Scienze, *Perché il concetto*, cit., p. 56 and Miranda, *Relazione*, cit.

Let's examine the following clinical condition: we cannot find a structured cerebral electrical activity; the production of the anti-diuretic hormone is absent (presence of diencephalic syndrome); awareness, consciousness and breathing are absent; all brainstem reflexes are absent; the endocranial hematic flow is totally absent; any metabolic activity is absent from the encephalus. When facing this situation, is it possible to believe that this is a body "without a head" and that therefore the individual is dead although some parts of his/her body can be kept – artificially – still functioning?

The Committee believes that in this condition it is scientifically and ethically accurate to define the individual as "dead". The presence of some cells or of other organs that are still vital – thanks to technology – in the current state of scientific knowledge is not sufficient to state that the passage from life to death has not happened for the individual.

The Committee agrees with what, in interpreting the neurological criterion, derived from human physiopathology, supported by the clinical observation of the last few decades: namely, it believes that in the condition described the human being is "dead". In fact, the endocranial damage, in its complex "pathogenic dynamic", interrupted the coordination between its parts exercised by the central nervous system.

However, if what some now call a "corpse with a beating heart" can benefit from mechanical ventilation which ensures an efficient gaseous exchange in the lungs and manifests a cardiac activity helped by the intrinsic contractility of the cardiac myocytes (supported pharmacologically), there still is (for a certain amount of time) a connection between the various organs due to circulation, which provides for their metabolic needs through the many active substances exchanged through blood circulation. No-one – in this physio-pathological interpretation – denies the existence of a connection between the parts, or the general action exercised on the organism by other specific systems (like the immunitary system, the hormonal system, ect.), which act through the vascular connection.

In addition, it must be stressed that, clinically, the use of the neurological criterion to declare the death of the biological human being must be carried out very rigorously, without being affected by other purposes, even if they are understandable and respectable. To be specific, the state of so-called "whole brain death" (better, "encephalic death") can be recognised from a number of signs:

- irreversible loss of the capability of awareness and therefore of consciousness (receptiveness and response to stimuli and signals from the surrounding environment);
- contextual loss of the ability to breath unaided;
- flat line EEG for a period considered clinically adequate;
- absence of brainstem reflexes;
- certain knowledge of the cause of the destruction of the encephalus.

It is indispensable, in reading the "signs", to take into account a series of variables: the circumstances of the state of coma (toxic coma, coma due to primitive profound hypothermia, coma due to a serious endocranial insufficiency or other metabolic pathologies); the difficulties arising in ascertaining the death of young children. When however the abovementioned signs can be observed "thoroughly", for a sufficient amount of time, encephalic death is certain: encephalic death does not "lead" to death but "is" the death of the individual, because the self-regulated functional unity that is typical of the

living, cease. The condition of life or death is still determined by the structural and functional integrity of the organ that has the specific task of preserving that structure or structures, which turns the different corporeal parts into an organic whole. Therefore, it is possible to confirm what the NBC already stated: “In practice, it can be said that death *happens when the organism ceases to “be a whole”, whilst the process of dying ends when “the whole organism” has reached complete necrosis*”.

However, the Committee is aware that some critical arguments about the brain death criterion must be taken into consideration, demanding (for those who are convinced of the validity of the thesis of whole brain death) a critical discussion from a scientific and ethical point of view, the elaboration of an adequate justification of this position and – where necessary – a reformulation of the concept and of the arguments supporting it, in particular with regards to the possibility that the process of necrosis in the encephalus is not immediately identified with the necrosis of all encephalic cells and that considering the encephalus the only organ integrating the organism is merely partially reliable. This, as we have said, does not affect the validity of the concept of death defined with neurological criteria, but it implies most of all the need for neuroscientists and doctors to give information that is more in line with the current clinical situation, due to reanimation and extra-corporeal support techniques. In fact, it appears more accurate to devise a different terminology from that in current use. Specifically, it is better to say that the patient is dead because of a “whole brain damage” rather than referring to the “cessation of all encephalic functions” or to a “brain dead” patient. Also, it is advisable to use the terms “keeping alive” and “medical treatment” when referring to procedures of mechanical ventilation or pharmacological treatment, which are eventually carried out on the body that is already a corpse, once the death has been ascertained without a shadow of a doubt with neurological criteria.

The NBC, on the other hand, as it already stated in its previous document, does not agree with those who believe that, in order to talk about encephalic death, it is sufficient to observe the permanent cessation only of the functions of the cerebral cortex. In fact, when the so-called “cortical death” occurs, the paleoencephalic centres remain intact and the capability of centrally regulating vegetative homeostatic functions remains active, including autonomous respiration. This kind of clinical situation (*brain failure*) implies the preservation of brainstem functions, which is the pre-requisite for the capability of awareness and consciousness, with the permanence of spontaneous respiration.

With regards to the criteria of death identified with the “cessation of activities in the brainstem”, we arrived at partially different conclusions from the previous opinion by the NBC. Criterion that, as already indicated, is adopted in Great Britain and supported especially by the Academy of Medical Royal Colleges. The NBC, in its previous opinion, considered it a criterion sufficient in itself, a judgement that we believe then influenced our legislation. It was observed that the empirical identification of a brainstem lesion is a prognostic sign of the cessation of the organism’s unity (cessation of respiration and, consequently, circulation) and a prognostic sign of the cessation of cortical activity (following the lack of oxygen in the brain). In the condition of limited brainstem lesion, as it has been said, it is still possible to keep the organism alive with artificial respiration (which allows oxygenation and oxygen circulation), as well as still witnessing cortical functions (with the appropriate

stimulation of some cerebral areas)²²⁰. The lack of investigation of the cortical activity with any instruments (the exclusion of EEG) – which can be found in some protocols based only on the analysis of the signs of lesion in the basal stem (e.g. examining the functionality of cranial nerves only through clinical observation was common at the time) – raised doubts, because the permanence of areas of uncertainty could give rise to the idea that a person whose cerebral cortex is still whole and functioning could be declared dead “and it is not right to put on the same level the inevitability of death and death itself”²²¹.

Probably this point of view is influenced by the then prevalent preoccupation of the NBC of avoiding (as already some proposed in other Countries but also in Italy) sanctioning the idea that the loss of function in the cerebral cortex (which would be in any case defined as “cortical death”) is the same as the irreversible loss of “all” the functions of nerve coordination exercised by the various “sections” of the encephalon on the organism as a whole.

Additionally, the inclusion of the serious and irreversible lesion of the stem area (which is notoriously made up of various functional nuclei) in the concept of “whole” brain death, was taken for granted. A very different situation is that of the rare “locked-in” syndrome, caused by a lesion in the pons area (which is part of the mesencephalon like the stem and closely connected to it): this condition shows that there can be lesions which do not prevent awareness and most cortical functions, but eliminate the possibility of communication. The example invites to be very prudent in identifying the relationship between confined encephalic lesions and general consequences.

We must focus our attention on a careful reading of the English regulations published in 2008 by the Academy of Medical Royal Colleges²²². This legislation stresses how the doubt is unfounded in the case of very extensive damage, so that observing a flat line EEG in the condition in which it is possible to adopt neurological criteria to ascertain death, would not add anything to the irreversible interruption of “all encephalic functions”, both of the brainstem and cortical. In those conditions, in fact, the necrosis of the brainstem is inevitably associated with the complete and definitive interruption of cortical activity as well, so that registering the EEG is superfluous and would not add to the level of certainty.

We must not, in fact, forget the premise: neurological criteria for ascertaining death can be used only when the cause of the brain damage is known (cranial trauma, brain haemorrhage, cerebral anoxia). In these conditions it can definitely not be hypothesised that the cortex is even only partially functioning, when the total necrosis of the brainstem has occurred because of an endocranial hypertension of such gravity that it causes the interruption of the endocranial haematic flow. In addition, when the clinical investigation aimed at demonstrating the absence of the trunk’s reflexes is impossible to carry out in a complete and reliable manner, even the English regulations expect validating investigations with instruments (listed in appendix 3 of the abovementioned document). It is interesting to observe how they are believed to be reliable: cerebral angiogram (to document the absence of

²²⁰ This can happen because the blood flow towards the cortex is not completely compromised; when for at least some time there has not been a complete occlusion of all arterial flow.

²²¹ Comitato Nazionale per la Bioetica, *Definizione*, cit., p. 13.

²²² *A code of practice for diagnosis and confirmation of death*.

endocranial blood flow in both the brainstem and the cortex); single photon emission computer tomography (which documents the absence of metabolic activity in the whole encephalus); the evoked potentials (which document the absence of electrical activity both in the cortex and in the brainstem). It is not instead felt that the EEG is completely reliable and a variety of medical protocols agree with this conclusion.

Therefore, the criteria are different (but only for what concerns the EEG), however the basic clinical concept is not different: the absence of all encephalic functions must be documented (awareness, consciousness, spontaneous respiration and stem reflexes) due to a known cause that has interrupted the endocranial haematic flow and the metabolic activity of encephalic tissue²²³.

4. The cardiopulmonary criteria

4.1. The recent debate

Within the discussion about the criteria for ascertaining death, in most recent years there has been a return of interest towards the cardiopulmonary criterion, used when kidney transplants started (1960s – 70s) and then pretty much abandoned because of its modest “productivity” in terms of success²²⁴. This new interest has happened due to the need of increasing the pool of donors²²⁵ and programmes have been initiated of organ removals not only from “heart-beating donors”, after having ascertained death with neurological criteria, but from “*non-heart-beating donors*”²²⁶, after a diagnosis of irreversible cardiac death²²⁷.

A possibility that has been realised – in some way – thanks to the advancements in transplant surgery and in organ preservation techniques. The success of the removal of organs from “non-heart-beating donors”, however, is affected by the decrease of the waiting period after the cardiac arrest (which allows to minimise the absence of blood circulation, which permeates the organs) and by the speed of the attempt – although failed – to treat the patient in cardiac arrest and transport him/her to an intensive care unit. Finally, a team that is adequately prepared from an organisational and technical point of view, must be available.

Therefore, the removal of organs in non-heart-beating donors today focuses our attention back on the organisational complexity and the difficulty of diagnosing death with cardiological criteria. An aim, this, which requires – as already mentioned – the shortening of the observation period of the organs’

²²³ R. Proietti, *La diagnosi*, cit

²²⁴ In 1997 this approach was called “innovative”, because it re-employed, with new methods and technologies compared to the past (cf. KOOTSTRA, J.K. KIEVIT, E. HEIMAN, *The non heart-beating donor*, “British Medical Bulletin”, 1997, 53, 4, p. 844).

²²⁵ Due to the decrease, amongst young people, of death caused by brain damage brought on by cardio-vascular pathologies and the improvement in the diagnosis and care of serious brain damage. The removal of organs from “heart-beating donors” represents in some European countries – like the United Kingdom and Spain – 10% of the contribution of kidneys and – a little less – of liver and they are set out to be, with some care, also the source of lung removals.

²²⁶ The expression “donation after cardiac/cardiopulmonary death” is also used.

²²⁷ By ascertaining the irreversible interruption of the heartbeat, to which follows also the interruption of blood circulation, breathing functions and ischemic brain damage up to the colliquation of the encephalic mass.

warm ischemia, and this happens (in this phase, which can be considered in many ways still experimental) with the use of increasingly more accurate investigations to ascertain death. It is about determining the time period considered sufficient for the duration of resuscitation attempts and for the tests indentifying the permanent interruption of the cardiac function to certify that anoxia has in effect caused the irreversible destruction of the whole encephalus²²⁸.

The central ethical question, therefore, concerns respecting the “dead donor rule” (similarly to what happens with regards to ascertaining death with neurological criteria), according to which organs can be removed only after the patient’s death. Consequently, it is essential to determine the criteria that allow ascertaining death, the way it is expected when ascertaining death with neurological criteria, in terms of equivalent diagnostic certainty²²⁹.

In literature and in international protocols we find a consensus about the diagnostic criteria for cardiac arrest, but there is no consensus in determining which observation time periods for the cessation of circulation and respiration are necessary but also prudent in order to declare the cardiac death irreversible. We find a variable time, which fluctuates between 2 and 20 minutes. The time is decided on the basis of more or less prudent empirical experiences, namely, on the basis of the observation that, after a certain amount of time from the cardiac arrest and after interrupting all attempts at assisting with medical instruments, the heart does not start beating again and it is not able to start beating again, believing that the cessation of circulation implies an irreversible whole brain damage.

It must also be said that determining an observation time that guarantees ascertaining the death of the individual, is in effect strongly linked in many countries to the different categories of donors, to which they refer for the removal of organs.

The Maastricht protocol (1995)²³⁰ identifies 4 categories: I- patients who have had the cardiac arrest outside the hospital and whose death is declared when arriving at A&E; II- patients who die in hospital after ineffective resuscitation²³¹; III- dying patients, especially those in intensive care units, whose care is interrupted after a certain fatal prognosis²³²; IV- patients whose

²²⁸ The “cardio-pulmonary” criterion is also linked to the neurological criterion of ascertaining death, on the basis of the organismic reality of the so-called Bishat tripod, which unavoidably links, in the case of the lack of (substitutive) human intervention, the loss of one of the three functions: respiratory, cardiac, neurological, to the subsequent loss of the others, independently from the order with which the first of the functions has suffered the catastrophic damage of the organism’s external or internal noxa.

²²⁹ Valko, *Ethical implications of non-heart-beating organ donation*, “Medicine and Morality”, Michaelmas 2002, vol. XVII, n. 3; J.B. Shea, *Non-heart-beating organ donation*, 1 September 2003, www.lifeissues.net.

²³⁰ G. Koostra, J.H. Daemen, A.P. Oomen, *Categories of non-heart-beating donors*, “Transplant Prod.”, 1995, 27, 5, pp. 2893-2894. The Maastricht protocol, which identified the categories of non-heart-beating donors, came from the first international Workshop on these issues. The protocol has quickly become a point of reference in European and international literature from a practical perspective, in order to group different categories for healthcare purposes and to verify the outcomes of transplants in different clinical conditions, in which the policy of acquiring transplant organs from individuals who died from cardiac arrest is trialled. Therefore, it is possible to compare statistics, which are necessarily still limited (survival after the transplant, rate of rejection or lack of functioning of the transplanted kidney, etc.).

²³¹ This represents the majority of the pool of non-heart-beating donors in Europe.

²³² This represents the majority of non-heart-beating donors in the USA. It is a category of patients that in Italy cannot be considered legitimate according to the laws in force: the law

cardiac arrest follows their brain death. Afterwards, a category V was added, proposed by a Spanish study group in Madrid: patients in cardiac arrest or suffering from an unexpected cardiac insufficiency during intensive care²³³.

Category III, which includes non-heart-beating donors in a so-called “controlled situation”, has led various protocols in the USA to adopt a timeframe for ascertaining death that is extremely short and varies between 2 and 5 minutes.

It must be clarified that this category includes patients in intensive therapy units, dependent from a ventilator, who, on the basis of their expressed will (or their family’s will), are disconnected from the machine. These are patients for whom the cessation of artificial ventilation is not due to it being a futile or objectively heavy treatment, but to a personal decision, which can also take into account the lack of dignity of those living conditions. In these cases the patients intentionally disconnected from the machine are not resuscitated, respecting their will to die and wait for their heartbeat to cease for a fixed period of time²³⁴.

The Pittsburgh protocol (1993) reduces the observation period of warm ischemia and anticipates the organ removal (including the heart) even after only 2 minutes from cardiac arrest and the interruption of artificial ventilation²³⁵. Other hospitals in the USA extend the observation period to 5 minutes, torn between the need of ascertaining the irreversibility of the cardiac arrest and the urgency of preventing organ deterioration²³⁶. The guidelines of the Ethics Committee of the Society of Critical Care Medicine (2001)²³⁷ define the

imposes the primary obligation of “carrying out all the interventions suggested by science” in the attempt of bringing back heartbeat and respiration and blood circulation, conditions that are indispensable to keep the individual alive.

²³³ S. Ridley S. Bonner, K. Bray, S. Falvey, J. Mackay, A. Manara, *UK guidance for non-heart-beating donation*, “British Journal of Anaesthesia”, 2005, 95, 5, pp. 592-595.

²³⁴ This position is considered ethically legitimate with different arguments. Some authors recognise that patients in these conditions are “dying” but that the removal of organs is legitimate nevertheless (D.W. EVANS, *Seeking an ethical and legal way of procuring transplantable organs from the dying without further attempts to redefine human death*, in “Philosophy, Ethics, and Humanities in Medicine”, 2007, 29, pp. 2-11; J.L. Verheijde, M.Y. Rady, J. McGregor, *Recovery of transplantable organs after cardiac or circulatory death: transforming the paradigm for the ethics of organ donation*, in “Philosophy, Ethics, and Humanities in Medicine”, 2007, 22, pp. 2-8.); others believe that patients in these conditions are “dead”, changing the concept of death with regards to the intention to not resuscitate/not be resuscitated (S. Shemie, *Clarifying the paradigm for the ethics of donation and transplantation. Was ‘dead’ really so clear before organ donation?*, in “Philosophy, Ethics, and Humanities in Medicine”, 2007, 24, pp. 2-18).

²³⁵ University of Pittsburgh Medical Center Policy and Procedure Manual, *Management of terminally ill patients who may become organ donors after death*, in “Kennedy Institute of Ethics Journal”, 1993, 3, pp. A1-A15; M.A. Devita, J.V. Snyder, A. Grenvik, *History of organ donation by patients with cardiac death*, in “Kennedy Institute of Ethics Journal”, 1993, 3, pp. 113-29; M.A. Devita, J.V. Snyder, *Development of the University of Pittsburgh Medical Center Policy for the care of terminally ill patients who may become organ donors after death following the removal of life support*, in “Kennedy Institute of Ethics Journal”, 1993, 3, pp. 131-143; G. Kootstra, *Statement on non-heart-beating donor programs*, in “Transplant. Proc.”, 1995, 27, pp. 2965 ss.

²³⁶ The Institute of Medicine suggests a wait of 2 minutes and 5 minutes at the most between the cardiac arrest and the interruption of resuscitation attempts (Institute of Medicine, *Non-heart-beating organ transplantation: medical and ethical issues in organ procurement*, Washington, D.C. 1997).

²³⁷ R.D. Truog et al., *Recommendations for end-of-life care in the intensive care unit: The Ethics Committee of the Society of Critical Care Medicine*, in “Critical Care Medicine”, 2002, 29, p. 2343: “these solid organ procurements are performed under protocols that call for life-

minimum timeframe as not shorter than 2 minutes, but believe that it is useless for it to be more than 5 minutes “if the objective is the removal of organs”. The President’s Council on Bioethics, USA, in the document *Controversies in the determination of death*, also identifies 5 minutes as the observation period generally applied in “controlled situation” cases²³⁸. The progressive reduction of the observation periods adopted by these protocols implies the sliding from the diagnosis to the prognosis of death.

With this timeframe it is possible to remove, together with the kidneys, the liver and in some cases the lungs, the heart as well. The heart that has ceased to beat in the individual declared cardiologically dead is removed in order to make it beat again in a recipient who needs a new heart to live. To the question, asked critically: how is it possible that a heart is removed from a dead donor and brought back to life in its functions in another recipient? We answer that the donated organ is removed from a context that cannot support the metabolism of myocardial cells, which can alive again once they are transplanted in another organism capable of supporting this cellular metabolism. The heart of a patient declared dead on the basis of cardiopulmonary criteria (in a “controlled situation”) can therefore beat again when transplanted, as long as the autolytic processes cease in the recipient. The problems are the same as those in the case of other organs removed from a donor whose death has been ascertained with both cardiopulmonary and neurological criteria, fully expecting that they can work again in the recipient.

The situation in Europe, with regards to ascertaining death with cardiopulmonary criteria, is quite varied. The University Hospital in Holland adopted the Maastricht Protocol, which establishes a waiting time of 10 minutes, including both patients in a “controlled situation” and in an “uncontrolled situation”²³⁹. Similarly the Zurich Hospital in Switzerland. In Spain the diagnosis of death with cardiorespiratory criteria implies specific clinical tests during an observation period not shorter than 5 minutes, after an “adequate period of resuscitation attempts”²⁴⁰. In France, only the removal of the kidneys and liver from non-heart-beating patients is allowed, in specific efficiency conditions of the procedures, which can ensure the usefulness of the removal, after “resuscitation attempts have ceased for 5 minutes”²⁴¹. In the

sustaining treatments to be withdrawn (usually mechanical ventilation) under controlled-conditions (usually in the operating room), with death declared by cardiac criteria following 2-5 mins of pulselessness”. Later it is stated: “alternatively, non-heart-beating organ donation can proceed after a failed attempt at resuscitation”: the definition of cardiac death in a “uncontrolled” situation is considered an “alternative”.

²³⁸ Chapter 6: *Non-heart-beating organ donation*.

²³⁹ Kootstra, Daemen, Oomen, *Categories of non-heart-beating donors*, cit.

²⁴⁰ In Spain the issue is regulated by the “Anexo 1” “Protocolos de diagnóstico y certificación de la muerte para extracción de órganos de donantes fallecidos” del Real Decreto 2070/1999 “Regula las actividades de obtención clínica de órganos humanos y la coordinación territorial en materia de donación y trasplante de órganos y tejidos”. On the basis of this directive, the 5 minutes timeframe was adopted by the Hospital Universitario 12 de Octubre in Madrid.

²⁴¹ In France, a number of Centres started trials on the basis of applicative decree n. 949 of the 2nd of August 2005 (which authorised the Protocol of the Agence de Biomedicine) of law n. 800 of the 6th of August 2004, updating the “Lois de Bioéthique”. The removal from non-heart-beating donors is authorised (explicitly excluding category III), after resuscitation attempts.

United Kingdom, the “non-heart-beating donor” is called “asystolic donor” and the timeframe is at least 5 minutes²⁴².

In Italy death must be ascertained – not only in the case of organ and tissue donation – by having proof of the absence of cardiac electrical activity and registering a flat line ECG for at least 20 continuous minutes, after an eventual resuscitation time²⁴³.

4.2. The position of the NBC

The NBC intends to recall attention on the ethical discussion about determining cardiac death, which received more or less widespread criticism with regards to the diagnosis of death with neurological criteria.

The NBC, in this document aimed at updating previous and already mentioned works, felt it necessary to offer a few first clinical and bioethical reflections raised even by this traditional criterion for ascertaining death, reserving, however, a broader study on the topic for a time when eventually a more direct and extensive Italian experience has matured, which is at the moment confined to the activity of a programme started a few years ago at the University of Pavia, limited to the removal of kidneys²⁴⁴.

The ethical controversies about the abovementioned protocols are mostly focused on the fact that the patient, due to an extremely short timeframe (2/5 minutes) for ascertaining death, could still “be alive”, because of the very short time elapsed from the cardiac arrest to declaring the irreversible loss of encephalic functions. The conclusions reached by the Pittsburgh Protocol and other similar documents are the object of clinical criticism²⁴⁵, also considered that the record of cases show the existence of spontaneous recuperations – although rare – after an asystolic interval of more than 5 minutes. In these documents the “irreversibility” of the cessation of the cardiopulmonary function is defined in “weak” terms (not absolute), as it is still possible for the heart to start beating again after medical intervention. The limit of the observation period is then “conventional”, as it is not based on scientific evidence. It is believed that the heart will not beat again, but it is a prognosis, prediction or presumption without real proof. On the contrary, it is possible that the observation period for the cessation of the heartbeat can be longer, as the heart is not “ill” but the cessation of the heartbeat is caused by the interruption of artificial ventilation; it is possible that after being disconnected from the ventilator, the patient starts breathing autonomously again, with a subsequent increase of the timeframe; in any case, the return of blood circulation is still possible if a resuscitation attempt is carried out. A recent study on “Critical Care

²⁴² E. Chaib, *Non heart-beating donors in England*, “Clinics”, 2008, 63, 1, pp. 121-134; Ridley, Bonner, Bray, Falvey, Mackay, Manara, *UK guidance*, cit.; British Transplant Society, *Guidelines relating to solid organ transplants from non-heart-beating donors*, London 2004.

²⁴³ Law 578/93 and Decree 582/94, adjourned in 2008 with the attached scientific guidelines.

²⁴⁴ In Italy, at the Policlinico “San Matteo” in Pavia, transplants of kidneys removed from a “non-heart-beating donor” are carried out following the guidelines found in the Alba Protocol: *Removal of Organs from a non-heart-beating donor (NHBD)*.

²⁴⁵ There has been criticism in the USA as well. Cf. J.L. Bernat et al., *Report of a National Conference on donation after cardiac death*, in “Am. J. Transplant”, 2006, 6, p. 282; J.L. Bernat, *The boundaries of organ donation after circulatory death*, in “New England Journal of Medicine”, 2008, 359, p. 669.

Medicine” (2010)²⁴⁶, on the basis of an analysis of scientific literature, believes that in a “controlled situation” there is no certainty for fixing a temporal limit on waiting for autoresuscitation in the absence of medical interventions²⁴⁷.

The Committee believes that ascertaining cardiac death needs the elaboration of independent, definite criteria for organ donation: the reduction of observation periods, functional to the removal of organs, is not believed to be ethically acceptable. The “rush” to remove the organs must not reduce the time necessary to ascertain death or decrease assistance or the quality of care to patients in intensive care or who are terminally ill. Therefore, a “prognosis of death” is not sufficient, as a prediction or probability, but it is indispensable to have scientific evidence of a diagnosis of irreversible cardiac death (similarly to brain death). The irreversibility must be intended “in strong terms”, as an absolute condition that implies the impossibility of spontaneous recuperation or, with the technology available, cardiac activity²⁴⁸.

The Committee believes that it is indispensable to clarify the distinction between patients in a “controlled situation” and those in an “uncontrolled situation”. The first situation raises considerable ethical issues, as it involves the early decision of interrupting life support therapies when they are not considered futile by the doctor (or clinical persistence), but are personally unwanted by the patient or his/her family. In literature it is not always clear if observation periods necessary for cardiac death refer to one or the other situation. The Committee does not intend to discuss in depth the issue of the “controlled situation”, which implies a refusal or renunciation of health treatments (a problem already tackled in the opinion *Refusal and conscious renunciation of health treatments in the patient-doctor relationship*, 2008). Here, we simply stress that observation periods from the cardiac death must be guaranteed, regardless of organ removals and the category of the eventual donors.

The bioethical problem is therefore essentially linked to the temporal clinical determination of cardiac arrest, which, if we don't intend to overlook the *dead donor rule* in transplants and substitute it with another, that of the *dying donor rule*, must be long enough to guarantee with absolute certainty brain death by anoxia.

The NBC believes that, due to the difficulties of ascertaining death with cardiopulmonary criteria on the basis of current scientific knowledge, the 20 minutes expected in the Italian legislation (Law No.578/93) allow a necessary cautious guarantee. In addition, in the Law there is no mention of a minimum or maximum time period in which the resuscitation attempts must be carried out, which are also linked to the specific circumstances of the cardiac arrest and to the competence of who, by necessity, is carrying out the resuscitation attempt. This obligation to resuscitate is certainly applied in the case of “unforeseen”

²⁴⁶ K. Hornby, L. Hornby, S.D. Shemie, *A systematic review of autoresuscitation after cardiac arrest*, in “Critical Care Medicine”, 2010, 38, 5, p.1247.

²⁴⁷ The authors believe that it is necessary to implement observational studies to determine cardiac death in patients following the cessation of mechanical ventilation (*ibidem*).

²⁴⁸ This is the position of: M. Potts, *Truthfulness in transplantation: non-heart-beating organ donation*, in “Philosophy, Ethics, and Humanities in Medicine”, 2007, 24, 2-17, pp. 2-17; A.R. Joffe, *The ethics of donation and transplantation: are definitions of death being distorted for organ transplantation?*, in *ibidem*, 25, pp. 2-28; T.S. Huddle, M.A. Schwartz, F.A. Bailey, M.A. Bos, *Death, organ transplantation and medical practice*, in *ibidem*, 2008, 4, pp. 3-5; F.L. Delmonico, *The concept of death and organ donation*, in “Transplantation”, 2009, 88, pp. 123-126.

cardiac arrests, due to causes that are internal (e.g. arrhythmia) or external (e.g. incident, mortal trauma) to the organism, whilst it is subject to different medical and ethical assessments when it is an event due to serious illnesses, in advanced state and terminal²⁴⁹.

Although a 10 minute period of absolute lack of cardiac activity – ascertained with certainty – is to be considered an element of high likelihood of the death of the human being, caution forces us to avoid reducing below 20 minutes the temporal limit of the wait before starting, on the body of the dead patient, the “technical” procedures that will allow the subsequent removal of organs. It follows that in Italy – should this practice develop – the eventual protocols used in the various hospitals for the purpose of removing organs from a non-heart-beating patient are not and must not be due to isolated or autonomous decisions, but must be elaborated following the law and its foundation, approved by the national guarantor authority (National Transplant Centre)²⁵⁰. The centres that will eventually be authorised, will also need to be made up of particularly qualified personnel, trained in the specific needs of these cardiological damages, and a public support network for those individuals suffering from cardiac arrest will have to be guaranteed, endowed with high efficiency and fast intervention times, with the aim of ensuring first of all a better chance of resuscitation.

The NBC believes that it is also indispensable to consider the international scientific debate and to increase the observational studies to verify the scientific possibility to anticipate the certain and irreversible identification of cardiac death or the eventual possibility of a temporal limit susceptible to variation case by case, also taken into account the difference between the diagnosis of cardiac death in adults and children. The Committee recommends that in determining this, there should be no place for economical or pragmatic reasons.

At the basis of this issue is also the question of whether it is ethically legitimate to interrupt resuscitation procedures that don't cause suffering, but “stabilise” the individual's vital signs (although precarious). For some, the problem turns into that of therapeutic persistence, for others medical assistance is intended as an act due to the individual who still shows vital signs. In addition, at least in the experience already documented on various occasions in the USA, it is not the individual's expression of will to “not be resuscitated” or to interrupt resuscitation treatments objectively considered unproductive (situation of therapeutic futility), but the assessment of the relatives and/or the legal representative, which is considered important. The situation is therefore often extremely complex from an ethical point of view.

Within these protocols, even before ascertaining death with cardio-circulatory criteria (flat line ECG for 20 minutes) and only after an evident lack of reaction to cardio-respiratory resuscitation attempts, the NBC believes that some technical actions that do not damage the patient are legitimate, if they are aimed at “achieving control for donation purposes after cardiac death” and as

²⁴⁹ In the cases included in the first hypothesis, assistance must be as quick as possible, because after a few minutes from the cardiac arrest (asystole) the damage – particularly brain damage – is serious and frequently fatal. The faster the transport and the care of hospital experts (A&E and intensive therapy centres), with the application of all the adequate criteria of cardiopulmonary resuscitation (mechanical and pharmacological instruments), the higher the chance of survival.

²⁵⁰ As the already mentioned Alba Protocol currently does.

long as they are necessary to allow the patient's positive and clear will to donate. It must always be a cautious and proportionate action, so that any medical intervention does not cause harm to the dying patient or an earlier occurrence of death or any damage to his/her dignity. Declaring death must never happen prematurely or early. It must be stressed that the protocol on ascertaining death, even when foreseeing the possibility of a transplant, must always respect the principle of equal dignity between the donor's will and the recipient's interest, considered individuals with equal rights. It is appropriate to have a cautious and prudent attitude, which always supports the privilege of life in uncertain situations.

5. Conclusions and recommendations

5.1. First of all the Committee states that, however different the criteria for ascertaining death, there is only one death.

5.2. It is the Committee's opinion that both neurological and cardiopulmonary criteria are clinically valid to ascertain the death of a human being.

5.3. The Committee rejects the idea that death can be defined on the basis of a mere "convention", even if justified by other humanitarian reasons and by solidarity, like organ donation. In light of this premise and when facing complex situations, the shared position is that a human being, if his/her clinical death is uncertain, must be considered alive and protected.

5.4. With regards to ascertaining death with cardiopulmonary criteria, the Committee:

- believes that in the current state of scientific knowledge, it is not ethically acceptable to reduce the observation period of cardiac death below what is today expected in the Italian legislation;

- recommends that the methods currently used to classify non-heart-beating potential donors must be taken into account only in fully equipped centres, explicitly authorised and operating particularly quickly to assist the unfortunate patient and through the adoption of an operative protocol, established nationally in line with the law in force.

The Committee reserves the right to reconsider the complex issue of ascertaining death with cardiocirculatory criteria as soon as an adequate assessment of the experimental phase currently being carried out in Italy is available.

5.5. With regards to ascertaining death with neurological criteria, the Committee:

- believes that the only criteria acceptable are those referring to the so-called "whole cerebral death" and the so-called "brainstem death", intended as total brain damage, which is irreparable and has caused an irreversible coma, where artificial support has occurred in time to prevent or treat an anoxic cardiac arrest;

- believes that – in the current state of scientific knowledge – other neurological criteria for ascertaining death are unacceptable, like that of the mere cessation of cortical functions.

Although the brain death criteria – intended as “encephalic death” – has been adopted by the most important academies of neurology in the world and is accepted in the legislations of almost all the Countries that have tackled these issues, the Committee believes that the way this concept is explained to public opinion must be updated and clarified, especially with regards to the terminology, with definitions that are more in line with current medical practice. In addition, it recommends that public opinion is made aware of the anthropological, social, ethical and legal implications of the criteria for ascertaining death.

5.6. The criteria adopted to ascertain death require following methods, procedures and the eventual recourse to verification tests. For this reason we recommend the highest level of conformity in the protocols both of neurological and cardiopulmonary criteria, which often appear different from Country to Country, causing confusion in the public opinion with negative effects on the relative belief in the reliability of the criteria themselves.

5.7. The NBC believes that Italian legislation on ascertaining death, supported by guidelines²⁵¹, adequately guarantees the public and is cautious enough to allow medical structures to adopt homogeneous practices.

5.8. With regards to the ethical validity of the criteria for ascertaining death, the starting point can only be the factual reality of death, as shown by clinical diagnosis. However, we must always be open to further analyses of the problem, especially when new or previously overlooked scientific data emerge.

²⁵¹ Law 578/93 and Decree 582/94 updated in 2008 with the addition of scientific guidelines.

GLOSSARY

Generally we refer to the following clinical situations.

= **Brainstem death:** state that follows the total and definitive loss of all encephalic functions of the stem, with the irreversible loss of consciousness, wakefulness, respiration and other vegetative functions.

= **Cortical death:** lesion of the cerebral cortex, in which the paleocephalon remains unaffected and the ability to centrally regulate homeostatic and vegetative functions is still active, including autonomous respiration.

= **Locked-in syndrome:** condition characterised by tetraplegia, facial diplegia, labioglossopharyngeal paralysis, laryngeal paralysis; most of the time this condition is associated with a lesion of the ventral pons of various etiology (hemorrhagic, ischemic, contusive, etc.), which leave unaffected somatic sensitivity, the reticular formation of the brainstem responsible for wakefulness and alertness, some mesencephalic neuronal groups which allow the patient to raise his/her eyelids and move his/her eyes vertically, the diencephalon and the cerebral hemispheres, whilst the cortico-bulbar and cortico-spinal ways are interrupted, depriving the patient of the ability to respond, except by vertical eye movements and winking (which allow the patient and the doctor to establish a code of communication).

It is very difficult to carry out a cognitive and emotive assessment in the acute patient, due to fluctuating wakefulness and eye movements that are inconsistent and limited in variety.

The diagnostic criteria anticipate:

- present consciousness;
- sleep-wakefulness pattern;
- quadriplegia;
- permanence of auditory functions;
- permanence of visual functions;
- communication: anarthria (or inability to speak because of a cerebral lesion);
- permanence of emotive state.

= **Vegetative state**, also known as **apallic syndrome** or **wakeful coma**: the particular and extremely rare condition of patients suffering from severe brain damage (lesion of the cerebral cortex), in which the coma has developed to a state of wakefulness that does not lead to a state of awareness or consciousness. The eyes are open, usually the mobility of the eyes and of the eyelids is maintained, but the patient does not follow a visual stimulus with his/her eyes. In addition:

- he/she has no awareness of him/herself or the surrounding environment;
- the cycle sleep-wakefulness is present;
- he/she has reflexes that cause involuntary movement in response to pain stimuli;
- he/she makes spontaneous, routine movements without purpose;
- he/she can have some archaic reflexes including mastication, swallowing, facial movements, yawning, grasping;
- he/she can regain autonomous respiration and swallowing.

= **Whole brain death:** state of total encephalic lesion (brainstem and cortical structures).

From a clinical point of view, both “whole brain death” and “brainstem death” identify the definitive loss of wakefulness, consciousness, respiration and brainstem reflexes.

We stress that the “**brain**” represents all of the parts of the central nervous system found in the cranium, which should be more properly called “encephalus” (from the Greek encephalon: “inside the head”). The cerebellum, scientifically, is the combination of telencephalon and diencephalon.

- telencephalon: it is the most superficial part made up of the *telencephalic cortex*, the *white substance* and the *base nuclei*
- diencephalon: it is situated inside the telencephalic white substance, and it is made up of five parts (*thalamus*, *epithalamus*, *metathalamus*, *hypothalamus*, *subthalamus*), it carries on below with the mesencephalon through the two cerebral peduncles
- cerebellum: the part of the encephalon situated in the posterior cranial fossa
- brainstem: functionally connected with the cerebellum, it is itself made up of three parts, in the caudal-cerebral sense:
 - mesencephalon: higher continuation of the diencephalon, made up by the two *cerebral peduncles* and by the *quadrigeminal plate*;
 - pons: positioned ventrally to the cerebellum;
 - myelencephalon: also called *midolla oblungata*, which carries on below, without interruptions, with the spinal cord.

PERSONAL REMARKS

Personal remark signed by Prof. Lucetta Scaraffia

Little more than forty years from the introduction of a new neurological criterion to define and ascertain death, the criticism towards it, initially voiced by a few scholars, is today considerably widespread, also in the light of new scientific knowledge, both in the medical and in the ethical-philosophical sphere. It is significant that the United States' bioethics commission felt it appropriate to tackle the issue again, publishing, in December 2008, an important document to discuss the issue in more depth. The topic of brain death is again the centre of attention also in other Countries. We can find a precise summary of this in the recent contribution by Sabine Muller, published online on the authoritative Ethik Med, with the title *Revival der Hirntod-Debatte: Funktionelle Bildgebung für die Hirntod-Diagnostik*.

It has therefore been very appropriate for the NBC to return on an issue already tackled in the past and on which, at the time, unanimous consensus had been reached. After a discussion which is at times considerably interesting – here I simply observe that Prof. d'Avack stated “the notion that the brain is the integrator of every function of the organism is now outdated”, a thesis that is instead reaffirmed in this opinion – it seems to me that the outcome is unsatisfactory. In fact, I believe that the way the consultations have been carried out, their evaluation in drawing up the opinion and the other three documents which it was felt important to take into account, is imbalanced. Having consultations in this case was very appropriate, as those who raised the problem in Italy are not NBC members. Essentially, they are Prof. Paolo Becchi (professor of Philosophy of Law at the University of Genoa) and Prof. Carlo Alberto Defanti (one of the most authoritative neurologist in Italy, very experienced and with a considerable bibliography on the topic in question). Certainly, from a medical point of view, one of the top experts about the issue under consideration.

The first was consulted, the second wasn't. Neither of them, however – directly - left a significant mark on the NBC's opinion. Only a brief mention of two monographies by Defanti and his numerous Articles. It is also questionable that out of seven consultations, of at least five it was already known from the beginning that they would defend the brain death criteria and only one would explicitly criticise it. I was especially surprised that on a topic of this nature, the NBC did not feel appropriate to consult at least one neurologist, that is, someone who certainly has better medical-scientific competence on the issue at hand.

The NBC's opinion states that they have “intentionally kept the problem of ascertaining death separate from that of organ transplants”; this however is clearly contradicted by the fact that a large part of the document deals with the cardiopulmonary criterion and “ this return of interest has happened due to the need of increasing the pool of donors...”. In addition, out of seven consultations, three concerned people directly or indirectly involved in the activity of the NTC. Actually four, as Prof. Azzoni was consulted with regards to the issue of organ donation from a non-heart-beating donor. Therefore it is not surprising that the document referred to in the Opinion is that of the NTC. In short, an opinion that should not have anything to do with transplants is based on the consultation of the director of the NTC, of two collaborators of the same centres and on a

document by the NTC, signed by two people who were consulted (Dott. Procaccio and Dott. Nanni Costa).

In addition, the way in which the second document has been used, that of the Pontificia Accademia delle Scienze, is partial and full of gaps. In the opinion, the fact that the Pontificia Accademia in the last few years has been quite torn about this issue, has remained completely unmentioned. It is correct to say that in the end the line now also adopted by the NBC, prevailed, but we must not forget that a considerable minority in the Pontificia, during the work carried out in February 2005, expressed itself against the brain death criterion. This is evident in the anthology edited by De Mattei, which largely (although not exclusively) reports all the dissenting texts presented to the Pontificia Accademia delle Scienze (Evans, J. Evers, D. Hill, J. Seifert, A. Shewman, R. Spaemann, W. F. Weaver). The Opinion quotes the anthology edited by De Mattei, but without even mentioning the fact that it collects the contributions of the work of those who, in the Pontificia Accademia delle Scienze, opposed brain death.

It seems that the Opinion has some difficulty in revealing that the Catholic world – which moreover is also testified by the abovementioned case of Prof. Vincent Pellegrino – is not completely in favour of the brain death criteria.

Let's come to the Opinion. My observations refer to points 3.2 and 3.3, point 3.4 and point 3.5. I start with point 3.2 and 3.3, which, after a short history (in which a thesis that will be developed later is announced in the final part), mention the criticism put forward towards brain death from both a scientific and a philosophical point of view. Here there is only a summary of the anthology edited by Becchi and Barcaro and published in 2004, quoting some essays translated in it. The only "original" things in this part are the idea, supported by the NTC and adopted by the NBC, that there isn't, in essence, any difference between whole brain death and brainstem death and the mention of Singer as a supporter of cortical death, when it would have been enough to read the article by Becchi to realise this scholar's progress, which has led him today to openly support the idea of a return to the traditional criterion of cardiac death.

What is most surprising, in all this section, is the almost total censoring of the work published on this issue in our country. We have already spoken about Di Defanti. Becchi is referred to only as the curator of an anthology, no mention is made instead of his 2008 book *Morte cerebrale e trapianto di organi* (a very widespread publication) and most of all of the work published soon after with his collaborators, R. Barcaro, P. Becchi, P. Donadoni *Prospettive bioetiche di fine vita*. This is the most exhaustive study about this topic in Italy, which takes into account the international scientific debate until 2008 and includes a dozen of pages of selected bibliography. With the result of underestimating the debate of the last few years.

The use of the anthology edited by De Mattei has not had better fate. Only three out of 18 contributions collected in it are mentioned, obviously forgetting to discuss, amongst others, a contribution by Cicero Galli Coimbra, a Brazilian neurologist who conducted accurate studies on brain dead patients. Finally, little use has been made of the three contributions presented by Becchi when he was asked to participate to this document, and attached to the documentation. And yet, all three documents presented at that time by Becchi would have required in depth analysis. In particular, if the document presented by him with the title *I segni della morte e la questione dei trapianti* had been read, we would immediately have realised that scientific literature is definitely

not inclined to consider – as believed by the NCT and, along with it, by the NBC – “brainstem death” and “whole brain death” as equivalent. As further confirmation we could now recall the article by Sabine Muller cited at the beginning. From the diagram found in this article (p. 4), it is evident that on the basis of *Brainstem death* as adopted in Great Britain, a patient affected by the last stage of *locked-in syndrome* would be dead, whilst for us he/she is still alive.

It is a serious mistake, from a medical-scientific point of view (and this is further evidence of how important a neurologist’s opinion would have been!) and in any case devoid of any truth, the statement that the Academy of Medical Royal Colleges, with its 2008 document, moved closer to the criterion of whole brain death. The contrary is quite true: it is the NBC that, distancing itself from its previous opinion, recognises – without obviously being able to say it – what the English have always stated, namely, the scientific unreliability of the whole brain death criterion.

Point 3.4 leaves me perplexed: there was an expectation of at least a serious discussion about the existing scientific literature that continues today to support the validity of the neurological criterion of death, stressing however, at the same time, the need to use a more precise diagnostic (recurring to cerebral angiography, functional magnetic resonance and positron emission tomography), but there is only a faint trace of this, with the mention of the last work by the Academy of Medical Royal Colleges.

In point 3.5, in which the NBC’s position is presented, we find a confirmation of the thesis expounded in an online document by the NTC (we must not forget that this document – however we want to judge it – had the only purpose of giving “some essential elements of information”); that means that in the current situation the distinction between “whole brain death” and “brainstem death” has disappeared. With regards to the rest, the NBC stresses how right its 1991 document was and accepts without discussion the theses in favour of keeping the definition of death in neurological terms.

Essentially, what should have been a serious discussion about brain death criteria, starting with the lively and abundant scientific literature about this topic published in the last few years, resulted in a wider opening towards transplants, making possible the possibility of brainstem death and the removal from non-heart-beating donors, which is in effect at the moment merely “tolerated” because – with the exclusion of the corneas – currently the only methods properly regulated by our legislation are those based on brain death criteria.

Therefore, I conclude stating that the document does not adequately respond to the challenge offered by the most recent scientific debate.

Lucetta Scaraffia

Presidenza del Consiglio dei Ministri



SUICIDES IN PRISON.BIOETHICAL INDICATIONS

25th of June 2010

Presentation

The opinion “Suicides in prison. Bioethical indications” departs from the ascertainment of the high number of suicides among the prison population which is far higher than that of the population in general, and from the consideration of the ethical and social importance of the problem, aggravated by conditions of noticeable crowding of prisons and the frequent recourse to incarceration. The fresh outbreak of suicides in 2009 and during the first months of 2010 makes it even more urgent to call the attention of the institutions and public opinion to this tragic phenomenon. In this document the Committee intends to draw the attention to collective responsibility with respect to the problem, in order to remove all those situations connected with custody which, besides the unbearable hardship of the loss of freedom, may foster or hasten the decision to take one’s own life.

The appeal to social responsibility is strengthened by the consideration of the particular bio-psycho-social *vulnerability* of the prison population compared with the general one. There is the moral duty to guarantee a prison environment that respects the dignity of the person in their journey towards social integration, in the light of a critical review of penal policies. The Committee considers that prison can take away only the right to freedom, without annulling the other fundamental rights, like the right to health and reintegration. The prisoner has the right to serve a sentence that does not degrade human dignity.

The Committee urges the competent authorities to set out a national plan for the prevention of suicides in prison, along the lines indicated by the European bodies. The plan should foresee indications: for the development of a punishment system that is more in line with the constitutional principles; for a greater transparency of the regulations within the prisons and for a greater personalisation of treatment, countering the ‘deresponsibilising’ and ‘infantilising’ practices which reduce prisoners to helplessness and humiliation; for a specific prevention not so much aimed at the selection of the inmates at risk of suicide, as to the timely identification of and intervention in situations at risk able to pass the ‘resistance threshold’ (like the psychological impact of being arrested, the trauma of incarceration etc.); for the development of monitoring and research into the phenomenon and for the specific training of staff starting with the examination of the single cases of suicide.

The opinion was drawn up in the working group coordinated by Prof. Grazia Zuffa, who prepared the draft, with written contributions from Profs. Salvatore Amato Stefano Canestrari, Francesco D’Agostino, Andrea Nicolussi and the indication for materials by Profs. Cinzia Caporale, Antonio Da Re, Laura Palazzani. The working group was also attended by Profs. Luisella Battaglia, Lorenzo d’Avack, Anna Gensabella, Demetrio Neri, Monica Toraldo di Francia, Giancarlo Umani Ronchi. Specialist opinions were given by Dr. Mauro Palma, president of the CPT (European Committee for the Prevention of Torture), Dr. Alessandro Margara, president of the Fondazione Giovanni Michelucci, formerly head of the DAP (Dipartimento Amministrazione Penitenziaria) and Dr. Sebastiano Ardita, Director General of the DAP prisoner direction and treatment.

The opinion was approved unanimously by those present (Profs. Salvatore Amato, Luisella Battaglia, Adriano Bompiani, Stefano Canestrari, Roberto Colombo, Francesco D’Agostino, Bruno Dallapiccola, Antonio Da Re,

Lorenzo d'Avack, Riccardo Di Segni, Emma Fattorini, Carlo Flamigni, Romano Forleo, Silvio Garattini, Marianna Gensabella, Laura Guidoni, Claudia Mancina, Assunta Morresi, Demetrio Neri, Andrea Nicolussi, Laura Palazzani, Alberto Piazza, Vittorio Possenti, Monica Toraldo di Francia, Grazia Zuffa).

The President
Prof. Francesco Paolo Casavola

Premise: prison suicides in a bioethical perspective

In its decision to deal with the problem of the high prison suicide rate, the National Bioethics Committee was moved by the concern for a phenomenon that is undoubtedly not new, but of such social and ethical importance as to deserve consideration, particularly at this moment in history: there was the fear that today's serious hardships of prison life, owing to overcrowding, would have created the conditions for a fresh upsurge of the phenomenon.

Unfortunately these fears have turned out to be justified, as 2009 set a negative record, with 72 suicides; in the first half of 2010, 32 inmates took their own lives and 44 attempted suicide.

The Committee is aware of the structurally afflictive nature of the prison sentence and of the evident incompatibility of prison with a balanced development of the person. Suicide is only one aspect of the wider and more complex identity crisis that prison brings about, as it alters relationships and relations, breaks up existential prospects and weakens projects and hopes. The clearest and most radical way to eliminate all these hardships would be that of an overall rethinking of the function of punishment and the role of the prison sentence. For some time now there has been talk of a criminal law crisis as a result of the increasingly widespread belief that punishment by means of the privation of freedom is today anachronistic and, in many of its aspects, in contrast with the rule of law and the respect of the psycho-physical integrity of the person. Prison Law arose from the need to guarantee prisoners the respect of those fundamental rights that are reduced, if not denied, by the conditions in which they are forced to live, seeking to avoid the afflictive elements precluding any future prospect of reintegration.

The sitting began with a consideration of the very nature of prison, thus going immediately to the heart of the problem. If the Enlightenment had succeeded in putting an end to the centuries old tradition of corporal punishment, one cannot see why our century should not question prison sentences. As much as this proposal arouses considerable ethical interest, the NBC considered it more opportune not to deal with this document in the debate on the function of the prison sentence, but to highlight those aspects that could make it possible, remaining within the present institutional framework, to reduce suffering and to pay greater attention to particularly vulnerable subjects like those serving a prison sentence.

Considering that the sphere of competence of bioethics is marked by the 'life sciences and the treatment of health', then it is its duty to bring the sectors to notice in which there exists a condition of hardship and crisis in relational and healthcare prospects, highlighting the social and political conditions fuelling them and proposing, at the same time, specific remedies and solutions. As the NBC points out in the introduction to the document on adolescent suicides, the concepts of the identity/subjectivity of the person in the juridical ethical sense and of society constitute inalienable points of reference that substantiate the bioethical debate²⁵². There is an institutional and an individual profile in every bioethical problem. One does not exclude the other, but they present different features that allow them to be treated separately. In this document priority is given to the individual aspect, the improvement of the single aspects of prison

²⁵² NBC opinion "Youth suicide as a bioethical problem", 17 July 1998

treatment, even in the awareness that a broader and more radical rethinking of the prison system is to be hoped for in the future.

The opinion quoted here above offers the precedent that is also useful to define suicide in prison as a bioethical problem, with all the due differences. It points out the way of 'a radical change in the way the adult world, in its multi-form expressions and functions, looks at adolescence' to significantly affect the dynamics more often underpinning adolescent suicide. Starting from here, in the chapter on bioethical indications the NBC reflects briefly on the delicate balance between the aspects of individual responsibilities and environmental/social ones concerning the understanding of suicide; between the risks of charging the phenomenon to individual characteristics with the consequent social deresponsibilisation, on the one hand or, on the other, of falling into a hyper/pseudo social protectionism of the subjects identified as being 'at risk of suicide'. Hence the NBC's option not so much in favour of a selective prevention for individuals/groups 'at risk', but of a prevention understood as the *promotion* of 'suitable elements to support a process of identity development in this phase of their lives'. This latter indication which distances itself from the increasingly pervasive use of the 'at risk' category, is particularly valuable with respect to the specific demands of prison.

Taking this document as a starting point, prison suicide can be tackled as both a warning light for the subjective hardship of the prisoner in the face of the loss of freedom, and as the symptom of social inadequacy, not so much to 'protect' the prisoners, but to respect their fundamental rights. The principle according to which imprisonment takes away *only* the right to freedom of movement is often disregarded: as a consequence, the rights to safety, health, reintegration and other rights too are not guaranteed. For this very reason the prison is often an environment that can foster or hasten a possible decision to kill oneself. As the French Committee of Ethics states, 'Prisons are also the cause of disease and death: they are the scene of regression, despair, self-inflicted violence and suicide'²⁵³.

From this perspective the prevention of suicide is closely linked to the protection of health, with another important bioethical aspect concerning the equity of access to healthcare resources. There are two critical points therefore: the lack (sometimes even absence) of respect of civil and human rights; the imbalance in the exercise of such right among prisoners and free citizens: the figures on the high number of suicides in prison (about twenty times higher than the general population rate) can therefore also be interpreted as a discrimination index.

It is true that suicide is an act of will, the result of an individual choice, sometimes difficult to understand by others in its motivations and as such must always be looked upon with caution and respect. But the respect for the unfathomable suffering of whoever decides to resort to this extreme gesture does not only counter, but, on the contrary, spurs on the common commitment to remove all the conditions capable of fostering or bringing about suicide.

Therefore, the prevention of suicide comes under the defence of health and life to all effects, as the promotion of an environment that respects people and leaves open a prospect of hope and a horizon of development of subjectivity in the journey towards social reintegration.

²⁵³ "La santé et la médecine en prison", Comité Consultatif National d'Éthique pour les Sciences de la Vie et de la Santé, opinion No. 94, 26 October, 2006, p.8

In prison social responsibility is particularly implicated owing to the characteristics of the prisoners' bio-psycho *vulnerability*²⁵⁴. The prisoners do not represent the mirror of the society outside. They are younger, poorer, less integrated in social, economic and cultural terms, They suffer from more physical and psychic illnesses.

Therefore, the prison is a *place of contradictions* with respect to the protection of health: the contradiction between the need for safety and the respect of fundamental human rights. There is a second contradiction between the duty to treat the prisoners, entirely subject to the authority of the prisons and a prison which, as already mentioned, disturbs psycho-physical equilibrium and makes people ill.

The ethical responsibilities of the community to protect health and life in prison for the most part coincide with the compliance with the principles and laws that are at the basis of our societies²⁵⁵. From this viewpoint one can interpret the statement according to which prison conditions are the mirror of the state of civilisation of a society.

The NBC has on other occasions dealt with the issues concerning life in prison with a declaration of 17 January 2003, giving a number of bioethical considerations. The NBC considered the high suicide rate and the degree of self-harming behaviour as signs of 'very serious hardship'; it considered that the overcrowding hinders 'drastically the real guarantee of human rights recognised to prisoners by the Constitution and by the prison regulations, making the references to treatment or rehabilitating commitment plethoric'; lastly it stressed 'the need for a careful reflection on the fact that the prison population is made up in almost its entirety of people characterised by specific conditions of serious social hardship (it suffices to think of the very high numbers of foreigners and drug addicts), conditions it is dutiful to take charge of, with new methods of punishment in mind'.

Seven years following that declaration, not only have no improvements been recorded, but the situation has even worsened. For this reason the bioethical indications of 2003 are still dramatically topical, starting from the appeal to principles: the protection of the health of those subject to the limitation of personal freedom in prisons is the moral as well as the juridical duty of the public powers; a prison sentence must not imply the jeopardising of fundamental human rights. The final hope for 'a detailed study aimed at the introduction of principle punishment without detention' is still just as valid. The present emergency situation in the prison system spurs on the NBC to offer points for reflection along the lines of the detailed study mentioned then, mindful of Article 27, para. 3 of the Constitution which states: 'Punishment cannot consist in inhuman treatment and must aim at re-educating the prisoner.

The limit defined by the norm – the non-contrariety to the sense of humanity – is clearly established in relation to the principle of human dignity which is the foundation of inalienable human rights. Even if the punishment causes distress, it must be conceived in such a way as not to reduce the

²⁵⁴ For the concept of vulnerability, see the Barcelona Declaration, the result of work undertaken in the European Community to stimulate public debate on the ethical aspects of care (*The Barcelona Declaration Policy Proposals to the European Commission, November 1998*).

²⁵⁵ These contradictions are highlighted in opinion No.94 of the above mentioned French Committee, pag.5. The documents again points out a contradiction between "the meaning of punishment, based on the individual responsibility of those committing an offence, and the imprisonment of an ever increasing number of people suffering from serious mental disorders".

person to a simple means, 'mortifying their dignity, and so compromise even the re-educational function.

It is true that in the assessment of punishment there is the problem of avoiding prison conditions that may damage health; but the non-contrariety to the sense of humanity expresses a need that transcends the protection of health and regards the human dignity itself to protect even in the infliction of punishment. Such serious issues as suicide and the self-infliction of wounds create an urgent need to reconsider the problem of the objective conditions of prisons; but before this it is necessary to highlight the indefensibility of a penal policy which is the very cause of overcrowding.

A penal policy that produces an overcrowding of prisons and as a consequence unbearable conditions leading to a considerable increase in the number of suicides, is directly against the principle of the humanity of punishment. Furthermore, there are hypotheses of anti-social behaviour with reference to which penal incrimination should be weighed up in relation to prison conditions, otherwise the punishment is only abstractly adequate to that behaviour while in fact it is not.

These reflections are an invitation to increase non-prison punishment. The widespread practice must be remembered of not fully applying the existing laws which would allow many people to avoid being kept in prison. This is the case for most of the prisoners in preventive detention, which the law foresees as an exceptional measure for those presumed innocent, and also for particularly weak subjects like drug addicts for whom alternative measures of treatment are foreseen. To imprison or to keep in prison people who according to the law would have the possibility of awaiting judgement or of being punished outside prison is a practice contrary to the sense of humanity and, as such, represents a denial of human rights.

The historical evolution of suicide in prison

The growing number of prison suicides has been the subject of study since the XVII century, when some coroners, called upon to investigate cases of violent death in British prisons, began to establish a link between the episodes of self-suppression and some specific aspects of imprisonment. Not until the nineteenth century did a systematic study of suicide begin, within the general problem of deaths and health in prison. Writing in 1820, Dr. L.R.V. Villermé, studying the prisons of Paris, observed that 'the mortality of the prisoners is considerably greater than those living in freedom, directly owing to the bad state of the prisons and the poverty, hardships, affliction suffered by the prisoners before being incarcerated'. As far as concerns the living conditions in prison and the differences in treatment from one prison to another, Villermé was convinced of the importance of this factor: depending on the type of prison 'during their imprisonment these poor souls have lost on average the probability of living 17, and even 30 years of life'. Half way through the nineteenth century, we find studies that use the suicides and deaths in prison as indicators for the assessment of the different systems of treatment. We find that the systems characterised by the isolation of prisoners had 12 times more suicides than the so-called 'common prisons' (Baccaro, Morelli, 2009, 26 onwards.).

With the publication of Enrico Morselli's work in 1875, we have a more complete picture of suicides in Italian prisons. Apart from the recognition of the

greater frequency of suicides among prisoners with respect to the general population, other related environmental characteristics can be seen: 1) in the systems based on work (penal farming settlements), there are fewer possibilities of finding suicidal behaviour 2) the prisons resorting to the isolation of prisoners have higher suicide and attempted suicide rates 3) the negative effects of isolation are manifested in the first months 4) in all the regimes the highest number of suicides is to be found during the first two years of imprisonment 5) the age group in which suicide is more frequent is from 21 to 30.

Many of these observations are still valid, particularly the negative effects of isolation. It must be remembered that in the nineteenth century, owing to the influence of Cesare Lombroso, it was thought that there was a causal relationship between biological/genetic factors and deviant behaviour. Lombroso himself wrote about the suicide of prisoners, linking the urge to commit suicide to the mental structure of the delinquent, devoid of any spirit of conservation. Suicide would be one of the features of the criminal man, an expression of the insensitivity towards himself as well as towards others; as a consequence, attempted suicide became a useful element for identifying criminals.

Despite the prevalence of biological determinism leading to a different interpretation of the criminal's behaviour from that of the normal man, another consideration for the reasons for crime and suicide among criminals was also coming to the forefront. Morselli himself states that not all those who are in prison belong to the criminal man category as meant by Lombroso, some committed an offence due to the weakness of mind or character or due to bad education or 'because they found themselves in fatal circumstances'. Some take their own lives through remorse or repentance, to 'to free themselves of the shame of prison', or also to avoid imprisonment or, among those sentenced to be hanged, to avoid the death penalty.

In the Twentieth Century, the data on the prison population began to be collected in a more reliable fashion. The first systematic survey collected data on suicides and attempted suicides in Italian prisons from 1960 to 1969: 403 cases were analysed (100 suicides and 303 attempted suicides). The data collected concern different variables, from the juridical position (type of offence, juridical situation, length of imprisonment before suicide or attempted suicide), to the position of the prisoner inside the prison (isolated, under observation etc.), to the personal situation (health, family situation, behaviour). The study showed that almost $\frac{3}{4}$ of the cases of suicide concern prisoners that did no kind of work in the prison; furthermore, 64% of the suicides, both successful and attempted, concern prisoners awaiting first judgement. With regard to the suicide rate, in the 60s the average is stable at levels of 3.01.

In the seventies the number of suicides begins to rise: at the end of 1997 there are 11.15 (every ten thousand prisoners), in 2000 11.40, reaching a peak in 2001 (12.52).

The increase in suicides must be interpreted within a profound change in the prison population, both in terms of quantity and quality. Before the seventies, the prisoners came from extremely low social levels, with very high rates of illiteracy. For the poorer social classes, prison was an event lived in continuity with other events of life, rather than a traumatic interruption. There existed a prison 'subculture', violent and coherent, which found its amalgam in the resistance /opposition to the place of custody. On the one hand, not much

attention was paid to suicide, almost as if it belonged to the ordinary day to day prison violence; on the other, the strict control (the prisoners almost always lived together in 'dormitories') and the strong cohesion of the group discouraged individual acts of self-aggression.

The disappearance of this subculture is the result of the prison reform (1975), along with social change and penal policy thinking. Since the seventies the decrease of violent offences has not meant a decrease in rates of imprisonment, but rather the opposite. Considering that in 1975 the prisoners were 30,000, in 2008 this number had reached 57,000, touching 60,000 in 2009. In parallel, prisons are increasingly overcrowded with marginalised classes, particularly vulnerable from the bio/psycho/social aspect. In particular, the WHO identifies young men, people with mental problems, people who are socially isolated, subjects with problems of drug abuse and those with a history of suicide attempts as being the vulnerable groups being more at risk of suicide: these groups are over-represented in Italian prisons (WHO, IASP, 2007).

In the 2000s, starting with the already mentioned peak of 12.5 in 2001, the rates seem to stabilize to around 10 (every ten thousand) until 2008, when a rate of 8 was recorded. In 2009 though there was a sharp rise.

With regard to the attempted suicides, in the 2000s the percentage fluctuated from 180 (every ten thousand) in 1999 to 137.90 in 2007 (with a low of 127.8 in 2004).

It must be noted that, despite the progress, the data from institutional sources are not yet completely reliable, also due to the difficulty in finding univocal criteria for data collection and the very definition of the behaviour leading to death as suicide or attempted suicide (for example the fatal outcome of intoxications with substances having psychotropic effects). For this reason independent sources are valuable²⁵⁶.

Another aspect of the problem is given by the number of suicides in relation to the overall number of prison deaths, compared to other countries.

Among European countries, Italy has a relatively high rate of suicidal behaviour with regard to the total number of prison deaths: out of an average of 50/60 deaths per year, suicides are about one third.

The cases of the suicide of prison guards must not be forgotten: from 1997 to 2007 64 guards took their own lives and many of these deaths were linked to the unrest owing to working conditions and *burn out*. A plan for intervention at staff level should take into consideration also the stress factors of the daily life of prison workers.

Studies on the variables affecting acts of self-aggression and suicide

Despite the extent of the problem and its persistence over time, there are very few systematic studies on it, and the existing ones are mostly interested

²⁵⁶ The work of data gathering and documentation carried out by some NGOs is of fundamental public importance, and in particular by the magazine and site of Ristretti Orizzonti, which has a quantitative and qualitative data base from 2000 onwards.

A Permanent Observatory for Prison Deaths has also been set up, born from the collaboration of Italian Radicals, Associazione "Il detenuto ignoto", Associazione Antigone, Associazione "A buon diritto", Radiocarcere, Ristretti orizzonti.

in the individual clinical perspective, without concentrating on the social and institutional variables affecting suicidal behaviour.

However, at the beginning of 2000 a series of studies began in Italy making it possible to set out a first risk profile with respect to the situational and environmental variables (Manconi, 2002; Manconi, Boraschi, 2006). Prisoners take their own lives with greatest frequency in the first year of custody (64.5% in the two-year period 200-2001, 61% in 2002, 63% in 2003); most of the suicides of the first year are concentrated in the first days and weeks. This is related to the traumatic impact with the prison environment as a factor that drives people to acts of self-suppression.

Furthermore, a connection is highlighted between suicides and the overcrowding of prisons: overcrowding, besides limiting the spaces and causing the deterioration of hygiene, jeopardises relations with the personnel and limits the possibility of accessing opportunities for recreation, training and work.

Even the hardship linked to overcrowding would be a factor that drives inmates to take rash actions, besides being predisposing.

Another element concerns the signs preceding suicide: in both the studies mentioned it seems that a considerable number of suicides could have been defined 'announced suicides', since the prisoners were suffering from bad or chronic depression or had already attempted to take their life on more than one occasion.

With regard to the juridical situation of those serving a prison sentence and the relative psychological implications, the two studies highlight the lower number of suicides among definitive subjects (e.g. in 2000/2001 44.2% of suicides was committed by definitive prisoners; 36.4% in 2002 and 48.3% in 2003). This shows that there are more suicides among those awaiting committal for trial or a first degree sentence or an appeal, even though with noticeable fluctuations. Aside from these variations, there is sufficiently stable data represented by the over-representation of suicides among the non-definitive inmates with respect to the whole non-definitive prison population (those with a definitive sentence are more than 60% of the prisoners). This means that, among the definitive prisoners, the propensity to suicide is considerably lower than that recorded among the non-definitive ones.

With regard to age, it is mainly the young men that take their own lives. Considering the cases of suicide in the various age groups and comparing them with the distribution of the prison population in these groups, a strong propensity to suicide between 18 and 23 can be seen. When a comparison is made with the general population referring to the 2002 data for example, it can be said that between the ages of 18 and 44 there are 50 times more suicides inside prison than outside (Manconi, Boraschi, 2006, 22 onwards).

Another survey confirmed that the narrowing of spaces and the deterioration of relations, together with the lack of opportunities, can in fact be related not only with suicide but more generally with self-harming and an aggressive attitude towards the staff and other inmates (Buffa, 2003). This study also showed that such phenomena are not distributed uniformly in the overcrowded prisons, but are more frequent in those sections with prisoners having less personal and social resources, who are less able to adapt and to take advantage of the few opportunities that prison life offers, particularly in situations of overcrowding. According to the author, this is a reconfirmation of E. Goffman's hypothesis on the total institutions and the so-called 'sector system': in the competition that is aroused, the least gifted part finds itself living

in the worst conditions in that context and this sparks off an escalation of marginality and suffering.

In general the literature on this issue examines suicidal behaviour separately with regard to acts of self-harming, since the deep motivations for this are assumed to be different. Furthermore, self-harming in the prison environment is interpreted as an instrumental and 'manipulative' way of obtaining concessions of various types.

Recently a different standpoint has been gaining ground: the manipulative element does not exhaust the motivations at the root of self-harming in prison, there is a 'continuum of self-destruction' that starts with the least violent self-harming behaviour, developing then into self-suppression. This does not mean interpreting the set of phenomena from a psycho-pathological viewpoint, but as seeing them as the expression of a state of hardship that can take on different forms (more or less serious) in relation to the subjects' ability to cope in the (specific) stressful situations.

With this premise, the most recent study carried out by the Italian Department of Penitentiary Administration analyses all the data on self-aggressive behaviour: suicides, attempted suicides, self-harming behaviour (e.g. body lesions or the swallowing of foreign bodies), abstentionist behaviour (e.g. the refusal to eat or to take drugs) (Buffa, 2008)²⁵⁷.

The most interesting results are the following: first of all, the greater frequency of prison suicide with respect to the general population is reconfirmed: in the period examined, there were 41 suicides among prisoners, equal to a rate of 4.6 per ten thousand, 7 times higher than the rate of the general population²⁵⁸.

On the other hand, the hypothesis of a more frequent recourse to suicide and in general to acts of self-aggression of drug addicts is not confirmed. With respect to the general data on the presence of drug addicts in prison admissions (24.85%), they committed suicide in 9.8% of cases and attempted suicide in 11.2%.

With regard to the foreigners comprising a general presence of 48.% of prison admissions, the suicides, attempted suicides and abstentionist behaviour recorded a

share of foreigners lower than the above-mentioned report (26.9, 42.1 and 39.6 respectively). Only for the self-harming behaviour is the number greater than the general figure (53.7%).

With regard to the ways of committing suicide, 87.6% hang themselves, 7% inhale gas.

²⁵⁷ The study, carried out by Pietro Buffa analysed the Dap data on Italian prisons from 1st July 2006 to 31 June 2007. From the methodological point of view, different indicators are used to calculate the prevalence of the phenomena inside the prison. By tradition, the prevalence was calculated on the basis of the average presence of inmates recorded in one day. Buffa instead uses the total number of admissions to prison in one year. According to the author, this would allow a more exact comparison between the prevalence of suicide (and other self-harming behaviours) in prison and within the general population. However, the different methodology does not permit a comparison with the data collected by the independent organisations.

²⁵⁸ One must be mindful of the fact that this rate is calculated on the basis of the admissions in one year, a considerably higher figure than the average presences calculated on one specific day of the year. This accounts for the difference in ratio with suicide in the general population (20 times higher, as was said at the beginning, compared with the 7 times higher of the Buffa research)

With regard to their juridical position, most of the prisoners resorting to self-aggressive behaviour have no definitive sentence (56.4%). The divide between non-definitive and definitive prisoners widens even more when the suicides (65.9%) and attempted suicides (62.1%) are considered. The phenomenon of over-representation already mentioned can again be seen: in the same period, the percentage of detainees in preventive custody or with non-definitive sentences was equal to 46.8% out of the total number of prison admissions. These data confirm (and stress) what has been put forward in previous studies. The same can be said for the concentration of self-aggressive behaviour in the initial phases of imprisonment. 32.8% of the incidents took place during the first three months following prison admission (26.8% for suicides and 45.6% for attempted suicides). In the second trimester the percentages go down by almost half and the decrease in the following trimesters continues in a similar way. If the suicides in particular are examined, over half (51.2%) were recorded in the first year.

The research has also highlighted the geographical distribution of self-aggressive behaviour: considerable differences are to be found, with regions having a number of incidents that are higher than their number of admissions (particularly in Lombardy, Campania, Lazio, Sicily and Tuscany). From the study of eight large metropolitan prisons, it can be seen that the incidents are concentrated in some sections²⁵⁹.

This observation on the 'geography of privation' highlights the importance of the context variables. From a study on the motivations declared by the personnel in the reports made in prison on self-aggressive behaviour, it appears that the motivations of a psycho-pathological nature are only mentioned in 0.06% of cases. Here too, as for the drug addicts, the hypothesis of a greater recourse to self-aggressive behaviour by these subjects, as found in international literature, is disclaimed. Further investigation is therefore necessary in order to go into these aspects in more detail.

The meanings of prison suicide and the steps towards understanding and intervention

This document has chosen not to go into the huge issue of suicide and to concentrate on the particular phenomenon of suicide and self-harming in prison. Moreover, with the disappearance of the inclination to interpret suicide from a pathological point of view in modern times, its understanding is still particularly complex, since it is a question of integrating the work and results of research of sociologists, psychologists, anthropologists and historians (Barbagli, 2009; De Leo, 2009). Even in the psycho-dynamic perspective it is difficult to identify the specific fundamental dynamics of this self-destructive act which entirely annuls every aspect of self-conservation inherent in human nature. The contradictions are not lacking: in a certain sense, suicide is presented as the solitary act par excellence, of the denial of the relationship with others. However, seeking to go beyond the act in itself, the meta-communicative aspect of it can be grasped: while at a conscious level suicide seems to want to deny any relationship with the world, at an unconscious level

²⁵⁹ A particular concentration is found in the prisons of Milan-Bollate, Turin, Naples-Poggioreale (Buffa, 2008).

the act is presented to others, in a dramatic tension of affective relationship, both positive and negative (Fornari, 1981).

With regard to suicide in prison, on the one hand the factors of individual vulnerability must be considered, and the role (predisposing or catalysing) in the suicidal behaviour of some psychological and psychiatric disorders; on the other hand, one cannot disregard either the particular pathogenic/stressful characteristics of the prison or the specific levels of psycho-physical health of the detainees, which are lower than those of the general population. The combination of these two variables is such that the WHO considers prisoners as a group that is vulnerable with respect to suicide. The identification of individuals within the group that are particularly vulnerable to suicide due to their psycho-pathological characteristics is more complex and controversial. Moreover, in prison, unlike the outside, every self-harming act tends to be interpreted in the logic of custody, as resistance /rebellion of the detainee against the prison. It suffices to think of the 'communicative' dimension of self-harming acts mentioned above: it is usually interpreted as an intrinsic part of suffering, as a form of expression of the individual's malaise. On the contrary, with regard to the detainees, one reasons over their self-aggressive behaviour, trying to distinguish between 'manipulative' acts and acts that express a 'real' malaise.

It is true that the understanding of self-aggressive acts in prison cannot ignore the conflict, symbolic in primis, that is going on in individual bodies. For the prison, the management of custody is a problem of the control/protection of the prisoners' bodies. In final analysis the loss of freedom is realised in the 'handing over' of the body to the place of custody. The body is therefore the space of communication which becomes common to both the detainee and to the prison. In this sense, the prison is the place of the 'body language' par excellence. It is the immediate and regressive way that prisoners have to express themselves publicly, to communicate their own malaise to others, at times to claim their own rights. It is a 'speaking' by means of the injured body that betrays a relational helplessness and a profound anxiety in communication.

Once again, from the viewpoint of the 'prison that makes one ill', the reflection on the 'total institutions' is well-known, starting with E. Goffman's: all the aspects of the daily routine of the detainee are placed under another's authority, with the result that it annuls any private dimension or individuality. It is the 'depersonalising aspect of the prison', or 'a space devoid of symbolic expressions of identity, relations, history' (Bauman, 2002). The prison is therefore a particularly fertile context for experiences of *learned helplessness* and *hopelessness*, two signs of suicide risk (Beck et al.1975).

Prison is thus a place that creates the suicide risk, 'insofar as custody in itself and for itself is a stressful event that deprives the person of basic resources'; but it is also a place 'that imports the suicide risk', due to the precarious state of the psycho-physical health of the prison population, as declared by the WHO. However, the WHO also states that very few studies have identified elements that are able to distinguish the prisoners that commit suicide from the rest of the prison population (WHO, 2007, 7).

Hence the caution towards an approach (prevalently) aimed at identifying the subjects 'at risk', as a privileged form of suicide prevention: in a word, to 'psychiatrise' suicide in prison. This kind of approach, which psycho-social literature has for some time now defined as 'exceptionalist', focalised on

subjects labelled as carriers of deficit, has the defect of increasing individual stigmatisation, with the risk of not grasping the interaction between individual and environment. A 'universalist' approach is therefore preferable, that sees a more favourable context in the development of environmental opportunities for the fostering of the inmates' skills, starting with the weaker ones. This is the promotion of health approach, also and above all in prisons. There are two advantages to this: it removes the above mentioned dangers of the psychiatrisation of suicide, which is particularly insidious in prisons since it offers a culturally fertile ground for the recovery of the custodial tradition which was the task of psychiatry until not many decades ago; it avoids the excessive 'specialisms', in favour of a community approach involving all the personnel and the prisoners themselves in the creation of a 'healthier' or at least a 'less ill' prison.

Suicides in prison: can they be avoided? An ecological perspective

The choice of a universalist prevention approach in psycho-physical health means in other terms to privilege an ecological perspective, which considers the subject's position in the context of life and the relative interrelation arising from it. This is contrary to the firmly rooted idea that suicide is a psycho-pathological manifestation of an individual disorder. In support of the ecological perspective, some important studies on self-aggressive behaviour carried out in different towns of the United Kingdom, have highlighted the importance of situational and environmental factors such as social class and the area in which one lives. These studies have shown both the role of the adverse factors of stress (like poverty and unemployment), and that of the protective ones (relational support, marriage and partnership, with significant sexual differences) (Orford, 1992).

The choice of the ecological approach has important operational consequences: as highlighted by Laura Baccaro and Francesco Morelli, authors of the most recent and comprehensive study on the subject, in the first assessment of people who have just been admitted to prison (the so-called new arrivals) the classical psycho-pathological factors of psychiatric diagnosis are generally taken into greater consideration than the psychological reactions to the traumatic event which could foresee the coming on of a crisis (state of anxiety, the self-perceived ability to *cope* in the new situation). The 'continuum of stress' is also decisive, the continuous finding oneself in stressful situations, without being able to elaborate the different experiences of trauma and loss. "The psychological impact of being arrested and incarcerated, the fear of being abandoned by family and friends, the problem of withdrawal for drug addicts, the consciousness of a long prison sentence, the daily stress of prison life, are all elements that can go over a person's 'resistance threshold'" (Baccaro, Morelli, 90 onwards.).

In the perspective of understanding the interaction between the individual and their context, one of the most substantiated models for the interpretation of psychological disorder is that of *stress-vulnerability* and the mutual influence between individual psychological factors and environmental factors. The traumatic event of self-aggressive behaviour is seen as a symptomatic reaction to a combination of adverse environmental forces: the seriousness of the privation is proportional to the individual vulnerability factors, which result from

the relationship between adverse factors and protective ones, accumulated over time.

Adverse factors

Let us examine some of these factors:

Individual factors of a psychological and psychiatric nature: from the assessment records of the pathologies in the prison population, the data on depression are particularly significant. The prevalence of depression in the prison population results as 10.25%, but only 5% suffer from acute forms.

It must be noted that depression represents the group of psychiatric disorders with the highest rates in the general population too, even if there are noticeable differences in the estimates that can represent the effect of different criteria or methods of diagnosis. According to one of the most recent epidemiological reviews in affective disorders, the life time prevalence for the most serious depression is estimated at 6.7%, while the one year prevalence is estimated at 4.1% (Waraich et al., 2004). With regard to the Italian data, following the first epidemiological study carried out over a representative sample of the general adult population in Italy, depression records an annual prevalence of 3.5% (De Girolamo et al., 2005). For the purposes of the specific context of the issue dealt with in this document, the often crucial importance must be underlined that stressful lifetime events have in causing depression, as is found in a large amount of research on the subject. The lifetime event that is most frequent in association with depression is an experience of loss (not having interpersonal relations, the fall of role and self-esteem): these are experiences that concern most of the detainees, especially those in prison for the first time. Generally, the studies on lifetime events show that the risk relative to suffering from depression in the six months following a serious stressful lifetime event is six times higher than for an ordinary period (Paykel et al., 1996).

With regard to other mental pathologies, 6.4% are subject to these. Some research carried out on a sample from Padua prison in 2005 gives a high percentage of psychiatric co-morbidity among drug addicts in prison. This study is not however able to give an interpretation of the variables that contribute to such a concentration of psychic malaise (Bentivogli, 2006).

Situational factors: an important factor seems to be the amount of time spent in the isolation cell. A detainee that is 'isolated' or that undergoes specific custody regimes in a single cell to which he/she cannot adapt is at high suicide risk.

These cells are called smooth cells, because there is no furniture except a camp bed. They are used to isolate prisoners who appear to be unsuitable for collective life, and for inmates who could attempt or make another attempt at suicide. However, the privation of any form of community life and the removal of objects used in daily life accentuate the depersonalisation of prison, while the detainee is reduced to a state of total dependence on the staff for the most elementary needs. A high percentage of suicides takes place in isolation.

Another factor is that of the 'admission trauma': subjects can react to the stress of incarceration with an adaptation disorder, which can develop into a real post-traumatic disorder brought on by stress.

Psycho-social factors: the insubstantiality of family and social support is quite common among prison suicides. Social isolation is a risk factor for suicide.

Institutionalisation factors: besides the 'stripping of identity' of the subject, as the effect of the institutionalisation process, the total dependence on others for every aspect of daily life, leads to the 'infantilisation' of the prisoner.

In conclusion, the WHO lists some individual and environmental risk factors, which, if present in any combination or interaction, could contribute to increasing the suicide risk:

- groups considered vulnerable to suicide concentrated in prisons
- the trauma of admission and the daily stress of prison life can go over the resistance threshold of the average detainee and all the more so of those at high risk
- the procedures for the identification of prisoners at suicide risk do not exist in all prisons and, even when they do exist, there is not sufficient monitoring of the prisoners' stress and hence there is little probability of identifying very high risk cases
- even if the procedures exist, there can be a problem of the overworking of staff
- prisons can have a limited or totally lacking access to psychiatric services

The Judicial Psychiatric Hospitals

In the JPHs the suicide rate is over double that of the overall prison population²⁶⁰.

Apart from these figures, specific studies on the environmental variables in the interaction with the individual psycho-pathological factors are lacking. It must be noted that the population of the JPHs is composite, not all detainees are offenders who are declared mentally ill, acquitted and subject to security measures. There are also accused persons held under provisional custody, as well as people simply under observation, awaiting psychiatric report. Over the last years, perhaps owing to overcrowding, the flow from prison to JPHs has grown for 'observation' reasons.

Among the adverse environmental factors must be considered: the trauma of admission to prisons bearing the stigma of a criminal mental hospital; the suspension of a number of rights, primarily the uncertainty about the duration of custody, since the security measures can be renewed ad infinitum; the fact that in many cases security measures are renewed, not because it is thought that elements of social dangerousness exist, but owing to the lack of external residential facilities that can house the detainees.

With the passage of prison healthcare to the NHS, the management and organisation of the JPHs has been undergoing a radical shake-up. It is foreseen that internment in a JPH will be limited to people subject to definitive

²⁶⁰ These are the results of the DAP data processing with regard to 2004-2007. The prisoners, representing 2.59% of the prison population, committed 5.83% of the suicides and 3.26% of the attempted suicides. As far as concerns self-harming behaviour and the refusal to eat and be treated, the relation is reversed (1.63% of self-harming and 0.65% of abstention from eating and being treated).

security measures, with a reduction of about one third of the number of detainees. A regional distribution of detainees is also foreseen to encourage the discharge and the impact with the outside of those who have already completed the security measure period.

Female suicides

It is difficult to find figures on prison deaths with any particular attention to difference in gender. The justification adopted is that women in prison are considerably fewer than men. Most of the international literature on suicide has not found noticeable differences between the sexes in the suicide rates. It must however be noted that the extremely limited number of female suicides in the sample groups invalidates the soundness of the results. From the Italian data however, it results that women prisoners take their own lives more than men²⁶¹.

As well as the statistical surveys and the quantitative research, qualitative research would also be important, in order to identify the female perception of prison stress and the differences in the protection and vulnerability factors.

According to the 'Women in prison' research, women find it harder to live the 'life times' on their bodies (menstruation, maternity, menopause and ageing) compared with men. Women often somatise their malaise, having problems with their menstrual cycle and breathing disturbances. It is as if women lived on their bodies not only the burden of being forced to live in a limited environment, but also the passing of time, the anguish of separation, the negation of femininity and maternity (Campelli et al, 1992).

The answer from the institution

To guarantee the safety of the detainees is a duty of the prison administration and comes into the tasks of custody. This is a different point of view from that of the prisoners' subjective right to health and life. From a security point of view, the prevention of suicide can lead to a more intensified control of inmates and the self-harming act can be defined as an act of insubordination; from the point of view of subjective rights, prevention demands the elimination/reduction/countering of environmental factors that can bring about suicide, starting with the guarantee of the respect of fundamental human rights.

Over the years, prisons have taken on the protection of the detainees' right to health as one of their tasks, but the contradictions remain: not by chance, the same measures are applied to prisoners who have attempted suicide as those that are given as sanctions against detainees that disturb prison order. Whether prisoners disturb prison order thus endangering security, or whether they attempt to take their own lives, the 'constant watch' regime is usually applied: in this way prevention measures coincide with those of punishment. This is the case of the isolation regime in 'smooth' cells,

²⁶¹ From DAP data referring to 2004-2007 female suicides make up 6.2% of the total number of suicides, while only 4.4% of the prison population.

but also admission to a JPH for observation can be seen as punishment by the prisoner²⁶².

The prison administration began to deal with the problem of suicide and self-harming more specifically in the eighties when a number of categories of prisoners at risk were identified (those with mental disorders, drug addicts, young offenders, first time arrivals, and generally speaking all those who experience the privation of freedom in a particularly difficult and traumatic way)²⁶³.

In 1987, the “Servizio Nuovi Giunti” (the New Arrivals Service) was set up: it consisted in psychological aid (with psychiatrists, psychologists, criminologists) working together with the doctors, with the aim of identifying the subjects at risk on the basis of psycho-pathological diagnosis. The new arrivals diagnosed as being at risk were sent to a specific sector²⁶⁴.

From the year 2000 onwards, further guidelines were issued for the reduction of prison suicides. The New Arrivals Service (Servizio Nuovi Giunti) was substituted by the Reception Service (Servizio di Accoglienza) for new arrivals, with a more ‘ecological’ setup, less specialist and psychiatrising²⁶⁵. These guidelines require prison officers to encourage new arrivals to master their new situation, in an attempt to give a new dimension to the experience of disorientation and helplessness, advising them: 1) to immediately inform the prisoners of the possibility of speaking to specialised personnel 2) to inform the prisoners of the regulations marking prison life. ‘Listening centres’ are created with operators from different areas (health, prison treatment, prison officers), whose task it is to intervene in the event of family or personal problems, to offer psychological support, see to basic needs, and to assist the needs linked to the status of foreigner²⁶⁶.

Recently, with the rising unrest in prisons and the increase in the number of suicides, the Dipartimento Amministrazione Penitenziaria has once again issued guidelines to reinforce the observation of and attention paid to detainees, both by involving prison officers in this activity to a greater extent, together with the education staff and volunteers, and by fostering a greater participation of volunteers and representatives of the external community, during afternoons and evenings too. The need is stressed to guarantee the exercise of a number of rights – like meetings with one’s defence – and to pay attention to the ‘spaces and moments of intimacy between prisoners and their family and spouses’: in this sense previous specific regulations are mentioned to facilitate the access of children who have to meet a parent in prison²⁶⁷.

²⁶² With the entry of the NHS into the prison service, prisons should be given the possibility to carry out the task of psychiatric observation, as it is not right that it is done by the JPH (Margara, 2010)

²⁶³ See circular 3182/5632 of 1986

²⁶⁴ Circular 3233/5683, “Protection of the life and physical and psychic safety of prisoners and the inmates. Institution and organisation of the New Arrivals Service”

²⁶⁵ To be noted is the DARS project (prisoners at suicide risk), financed by the Lombardy Region and active since 2004 in the prisons of San Vittore, Opera, Pavia, Monza, Como, Busto Arsizio e Bergamo, after the service had been started experimentally at San Vittore in 2001. When an inmate at risk has been identified the DARS psychologists intervene promptly.

²⁶⁶ See circular 3524/5974 of 2000, “Acts of self-harming and suicides in prison. Operational guidelines with the aim of reducing prison suicides”, and the circular of 2007 setting down indications and rules for the reception of prisoners coming from freedom.

²⁶⁷ Circulars of January 2010 “Suicides emergency – the setting up of a Penitentiary Police listening unit” and April 2010 “New interventions for the hardship deriving from the condition of

Lastly, useful initiatives set up in some prisons at an experimental level must be mentioned: in the district penitentiary of Turin, 'attention groups' have been created to identify critical situations in the bud; in the San Vittore prison in Milan, help groups have been set up by the prisoners themselves to support the inmates that appear more fragile.

At a European level, some countries, like France and Spain, have launched plans of action over the last few years which have led to a substantial reduction in the number of suicides. According to the European Committee for the Prevention of Torture and Inhuman or Degrading Treatment or Punishment, the plans should foresee indications to set up an effective survey system for suicides and self-harming incidents, organise the training of staff to work on specific cases, to create structured integrated teams, guaranteeing also the presence staff involved in prison treatment, volunteers and their coordination with prison officers.

Bioethical stances and conclusions

In conclusion, the prevention of suicide passes above all through the guarantee of the right to health (understood, as happens nowadays, as the promotion of the psycho-physical and social wellbeing of the person) and of the right to serve a sentence that does not degrade human dignity.

From the ethical point of view, the first thing to do is to ask whether prison, as we know it today, in fact guarantees such rights. In the daily life of custody, many obstacles come between their full exercise. The following points list some of the most serious:

- overcrowding, which has reached unprecedented levels: this reflects on the staff's workload, with the result, among others, of the further narrowing of the spaces for the prisoners to move inside the prison;
- in the daily prison life the detainees often face further restrictions with respect to those intrinsically connected to the limitations of prison (work opportunities, training and education, the control of mail, the availability of personal belongings, relations with the staff, other inmates and the external society). In overcrowded prisons it happens that people spend even 20 hours out of 24 in their cells, without being able to do any kind of activity or education or work;
- the high number of persons in preventive custody (almost half the prison population): this is an anomaly in itself in the first place since, according to the law, preventive custody is foreseen as an exceptional measure (on the basis of the assumption of the innocence of the accused); as a bitter paradox, it is the prisoners awaiting judgement, who as such receive no prison treatment, who are forced into inactivity and find their spaces and exercise reduced;
- the high presence of inmates diagnosed with addiction pathologies, who are in prison in spite of the fact that the law states that treatment outside prison is a valid alternative (drug addicts represent 33% of prison admissions)²⁶⁸. If recourse to preventive custody were reduced and better use

the privation of freedom and self-aggressive phenomena". The latter circular refers to the note of 10 December 2009 "Prison treatment and parenthood".

²⁶⁸ The figure refers to 2008. Over recent years there has been a growing cause for concern: not only has the entrusting of prisoners to alternative therapy decreased, but those from

were made of the norms on alternative therapeutic treatment to prison, the problem of overcrowding would be considerably reduced, if not overcome;

- overcrowding and the overburdening of staff with work have immediate effects on the risk of suicides, which, as has been outlined, are more frequent in the first months of imprisonment and in preventive custody. In the so-called 'transit area', where the prisoners wait to be sent to the various sectors, the registration proceedings often take place in precarious logistic situations with great psychological tension;

- the particular limitations in the communication with family that concern the foreign prisoners (calls to mobiles, not authorised until a few months ago, are still generally difficult)

- lastly, the unacceptable use of violence towards detainees, some cases of which have recently been reported by the press and through initiatives of the public prosecution.

The general picture given above highlights a contradiction between the exercise of the prisoner's first right – the goal of custody being social reintegration – and a life in prison that forces people to regress, without any aim in life, in some cases even being subjected to violence.

The rectification of this contradiction is not only the task of the judicial and penitentiary institutions, but is the ethical responsibility of the whole society. Nowadays public opinion is particularly sensitive to the issue of the 'respect of legality'. It must be remembered that this principle is not valid only for people who have committed an offence and for this reason are serving a sentence: the principle according to which the privation of freedom does not take away the other human and civil rights is also totally deserving of respect. The fact that this aspect is often left out in the present debate is an indicator of the difficulty that our society has in fully recognising prisoners' rights.

Lastly it must be stressed that, with the end of prison healthcare, the institutional responsibility for the protection of health in prison is under the NHS. The health facilities are called upon not only to improve the quality of the individual clinical treatment, but to take on the responsibility of environmental protection, paying due attention to the sanitary conditions of the prisons and guaranteeing the necessary control.

More generally, the health reform in prisons opens up new possibilities for a relationship and continuity between the prison and the outside, to fill the gap between the protection of health inside and outside prison, bearing in mind the particular vulnerability of the prison population. From this viewpoint the prevention of suicide in prison is an area of intervention also for the local health authorities, in particular by means of mental health services outside prison.

The NBC considers that the prevention of suicide should go through a change of context in prisons, motivated by the respect of the prisoners' rights of citizenship and human rights. In the final analysis, 'to humanise prison' means to restore a horizon of hope and autonomy to the detainees.

In this framework of the assuming of collective responsibility for the respect of prisoners' human rights, specific interventions should be promoted: the setting up of a *national plan of action for the prevention of suicides in prison*

freedom have considerably gone down. This means that prison, also in preventive custody, is becoming the norm for drug addicts (Parliamentary report on drug addiction 2009).

is recommended according to the guidelines indicated by the European bodies. The plan should foresee recommendations for:

- the development of monitoring and research on suicide and acts of self-harming for a better understanding of the phenomenon;
- normative guidelines for the introduction of the mainstream non-prison punishment, lacking until now – except for the modest mention of a mere fine and some measures given by special judges – in the Italian legal system. This is to be hoped for in consideration of the specific conditions of the serious social hardship of today's prison population, with the high number of foreigners and drug addicts;
- greater transparency of the internal rules, overcoming the institutional opacity that makes suffering in prison unacceptable, insofar as being indecipherable. For this aim the general 'de-responsibilising' and 'infantilising' attitude towards prisoners must be stopped along with the use of particularly risky practices such as the recourse to isolation.
- an immediate plan of action to decrease the detainees in the JPHs according to the indications foreseen by the passage of prison healthcare to the NHS
- the organisation of specific training for personnel in suicide prevention, starting with individual cases
- the development of the personalisation of treatment, guaranteeing the actual presence of specialists, especially psychiatrists, in the observation and treatment staff
- the improvement of communication between prisoners and staff; in particular the creation of informal networks to listen to and support detainees that use all the resources available, formal and informal (from operators of all professions to detainees), for timely 'crisis interventions'.

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Presidenza del Consiglio dei Ministri



**THE LIVING CONDITIONS OF WOMEN IN THEIR THIRD
AND FORTH AGE: BIOETHICAL ASPECTS OF SOCIAL
HEALTHCARE**

16th of July 2010

INTRODUCTION

The document tackles some social healthcare and bioethical issues regarding women over 65 years old, a section of the population which is at high risk of going over that threshold of deprivation, in a psychological as well as material and relational sense, above which it is impossible to make any choices, due to not being able to access the most basic resources necessary to lead a life that is more than mere survival. This document is part of the so-called “everyday bioethics”, which complements “cutting-edge bioethics” (focused on extreme cases of human life manipulation).

In particular, it tackles the issue of distributive justice and equality in the access to (not unlimited) resources, referring to gender and age differences. The document highlights how, when dealing with healthcare issues, we must adopt a morally justifiable criterion of priority, offering everyone equal opportunities to reach the maximum potential of health allowed by their age, supporting the most disadvantaged individuals.

Reporting social, medical and psychological data, the Italian Bioethics Committee highlights how women over 65 years of age, with the passing of time, find themselves in situations that can diminish or hinder their ability to be self-sufficient, plan and make conscious choices, being particularly vulnerable from a bio-psychological and social point of view. The reduction in income is immediately reflected in a worsening of their quality of life, especially if their expenses increase due to the onset of chronic pathologies, if they live alone (there are about three million married women in this age group and just as many widows) and are deprived of social roles and functions. It therefore appears evident that personal *happiness* (which can be assessed today with precise social-psychological surveys) cannot be linked only to an increase in financial and material wealth, measured by the GDP (Gross Domestic Product) or by the goods they own and their potential as consumers, but it must take into account how each individual perceives her bio-physical reality.

With regards to the third and fourth age, great value must therefore be given to the essential factors leading to what is called a “flourishing life”, like enjoying significant relationships and developing self-esteem and optimism, always in view of “being happy”, which is the fundamental objective not only of the investments decided by financial policies, but of a medical care that takes into account, as well as the cure, also the “taking care”. The document suggests prioritising a social-healthcare intervention for this section of the population, believing that it is one of our ethical duties at this moment in history.

The document is the result of many years of commitment from a working group coordinated by Prof. Romano Forleo: it was drafted by Prof. Monica Toraldo di Francia and Prof. Antonio Da Re, with the participation of Prof. Luisella Battaglia, Prof. Cinzia Caporale, Prof. Riccardo Di Segni, Prof. Laura Guidoni, Prof. Claudia Mancina, Prof. Demetrio Neri, Prof. Giancarlo Umani Ronchi, Prof. Grazia Zuffa. The working group’s discussions were integrated with contributions by the following: Doctor Carla Collicelli (vice-director of the Censis Foundation and professor of Sociology of public organisations and services at the Università degli Studi di Roma Tre), Doctor Francesca Loporcaro (ISTAT researcher), Prof. Vincenzo Marigliano (Director of the Department of “Sciences of Aging” at the University of Rome La Sapienza).

The document was unanimously approved by those present, with Prof. Amato, Prof. Battaglia, Prof. Bompiani, Prof. Colombo, Prof. D’Agostino, Prof.

d'Avack, Prof. Flamigni, Prof. Forleo, Prof. Garattini, Prof. Gensabella, Prof. Isidori, Prof. Morresi, Prof. Neri, Prof. Nicolussi, Prof. Palazzani, Prof. Scaraffia, Prof. Toraldo di Francia, Prof. Umani Ronchi, Prof. Zuffa voting in favour. Prof. Canestrari, Prof. Da Re, Prof. Dallapiccola, Prof. Di Pietro and Dott. Guidoni, absent from the meeting, expressed their agreement.

Prof. Francesco Paolo Casavola
President of the NBC

PREMISE

From 2007, which was declared the European Year of Equal Opportunities for All, with particular reference to issues concerning healthcare, the literature about this issue has grown with numerous studies and reports, highlighting particular intervention needs. This premise to our work does not intend to be a summary of the scientific contributions on this topic; instead, it sets out to collect some useful ideas when reflecting on a specific section of the Italian population, which we believe is at risk of not being given “equal opportunities” in healthcare, and on the bioethical issues involved: elderly women (conventionally we consider elderly women who are over sixty five years old, even though the most serious problems arise later, after seventy five years of age, as illustrated in attachment (1).

The use of the notion of equal opportunities immediately brings to mind issues of public ethics, namely, of distributive justice in sharing resources which are, for their own nature, limited or in any case not unlimited, according to a perspective that tends to identify as wrong, that is, unjust, the inequalities in the destiny of populations and individuals which can be ascribed to human responsibilities. With regards to the issue of health, the studies on this subject confirm that in the last decades, with the acceleration of the process of globalisation, the dramatic gap between the North and South of the planet has been exacerbated further, and in Italy as well, the difference between the health conditions in the various geographic areas and sections of the population has increased.

Using the distinction, now widespread, between “cutting-edge bioethics” and “everyday bioethics”, which identifies two possible approaches to the issue – corresponding to theoretical and legal interests which are partially different – we can immediately see that the problem of distributive fairness belongs to the so-called “everyday bioethics”. Cutting-edge bioethics concentrates, in fact, on the more problematic and controversial bioethical issues with regards to personal and public choices, in particular, with regards to the so-called limit situations (birth and death); the problem linked to these issues is often due to their radically innovative character, because of the continuous development of biomedical sciences and technical applications. Everyday bioethics, instead, moves in a dimension that is closer to people’s daily experience; rather than the exceptionality of extreme cases, it considers – so to speak – the normality of certain situations. It is clear that, between the two approaches (the one aimed at stressing exceptionality and the one focusing more on normality instead) there is inevitably a relationship, and it is evident that it would be simplistic to imagine that bioethics could move away from considering extreme cases, or, on the other hand, that it should only study extreme cases. The specificity of everyday bioethics consists, in any case, in adopting an analytical and critical point of view about the big issues concerning everyone’s life (Berlinguer, 2000): what emerges, therefore, is a more specific attention to the aspects of distributive unfairness in accessing the advantages of progress in biomedical science, in the same country and in the different areas of the world, and a stronger interest in the issues of justice, seen from a global perspective.

From this interest come:

- the investigations on the causes of inequalities in health conditions, due to absolute poverty – of income, education, infrastructures, healthcare services, access to medicines, etc. – in a perspective that considers relevant,

- the research on the profound geographical differences in maternal, perinatal and infant mortality rates, and on the many early deaths, which could be avoided and are due to a lack of medical assistance, famines, wars and violent behaviours, but also on the “double burden of disease” that today affects the inhabitants of the poorest countries²⁶⁹;
- the reflections on the various facets of the “medical-biological revolution” of the last decades, which has brought great benefits from a clinical point of view, but not for all, because at the same time it has worsened the gap between the various sections of the population in developed countries, and also between these countries and the rest of the world, from the perspective of people’s “capability” of staying alive and healthy.

As we have said, all the data available today reveals a growing increase of the inequalities in the impact of an illness on the population, in their psycho-physical discomfort and life expectancy, which require, to be understood in its genesis and fought with effective measures, an accurate scrutiny of the variety of factors that affect it and of the different people and levels of responsibility involved, both in national politics and in the dynamics redefining the relationship of power at the global level. With regards to this point, it is necessary to highlight that the inequalities in accessing healthcare and its services are not due only to a difference in social class. As stated in her contribution on this topic also by Carla Collicelli (vice-director of the Censis Foundation)²⁷⁰, it is important to try and identify this issue’s characteristics and current form.

Using the classification of health determinants proposed by Angelo Stefanini, Marco Albonico and Gavino Maciocco²⁷¹, which illustrates how “health” is dependant from the possibility of accessing a multiplicity of direct and indirect resources, we can then think of a series of “concentric sections”, corresponding to different levels of influence on the onset and evolution of illnesses, matching different levels of possible interventions, by various agents, on the factors that are susceptible to change and corrections (always however, taking into account their close interrelation). According to the model proposed

²⁶⁹ The document *Progress for Children: A World Fit for Children – Statistical Review*, presented by the UNICEF on the 10th of December 2007, highlights that in 2006 the number of children dying before their 5th birthday because of illnesses, hunger and wars, fell for the first time below 10 millions. Despite this, “Each year, around 4 million children die within the first 28 days of life, in the neonatal period”; in addition “Across the developing world, maternal mortality levels remain too high, with more than 500,000 women dying every year as a result of complications during pregnancy and childbirth. About half of these deaths occur in sub-Saharan Africa and about one third occur in South Asia. The two regions together account for about 85% of all maternal deaths. In sub-Saharan Africa, a woman’s lifetime risk of maternal death is 1 in 22, compared with 1 in 8,000 in industrialised countries”.

The “double burden of disease”, typical of the poorest countries, refers to the phenomenon which sees, to high infant mortality rate due to infectious diseases – malaria, Aids, tuberculosis, etc. – the added increase in deaths due to chronic-degenerative diseases like tumors, cardiovascular diseases, diabetes, etc.

²⁷⁰ C. Collicelli, *Disuguaglianze in sanità: l’evoluzione interpretativa a partire dalla ricerca sociale*, Fondazione Censis, 2007, paper made available by the working group.

²⁷¹ Cf. A. Stefanini, M. Albonico, G. Maciocco *I determinanti della salute*, in A.A.V.V., *Le disuguaglianze nella salute*, monographic number in “Salute e territorio”, No. 158, 2006, pp.267-274.

by the abovementioned authors, which proceeds from the central sections to the outer ones:

- at the centre, we find the individual with his/her biological characteristics, which are considered as a given: sex, age, genetic inheritance;
- the next section includes instead behaviour and lifestyle – smoking and alcohol, diet and sexual behaviour, physical activity, etc. – which can promote or damage health. At this level, it is about individual choices, which however can be more or less conditioned by the economic-social and cultural situation, as well as by the message disseminated by the medical community;
- next is the section of the interactions with family, friends and the surrounding community. Everyone's quality of life is in fact strictly dependant from a network of people we care about and who care about us, and social relationships, the presence or absence of which can influence the state of health because of the psychological states it triggers (e.g. emotive balance/depression and anxiety), and that often depend on favourable or adverse conditions (e.g. presence/absence of a network of family and/or social support);
- there is then a very complex and heterogeneous number of factors affecting psychological wellbeing and physical health, amongst them: the environment people live and work in, income, occupation, level of education, diet, housing, hygienic conditions, transport and traffic, healthcare and social services, etc.;
- with the outer section, we finally arrive at taking into consideration the general conditions – political, social, cultural, financial, environmental – in which individuals and communities live, amongst which we must also mention the level of social justice and solidarity a certain society is able to express. As some studies have highlighted, a widespread feeling of solidarity, which can institutionally translate in policies of effective distributive fairness, is an important factor of social cohesion, which can work as a flywheel for the improvement of the life expectancy of a population even in “emergency” situations (like for example post-war times) (Sen, 1999).

This classification helps us to understand:

- how the issue of health must be framed in the wider context of the discussion on fundamental human rights (*Universal Declaration of Human Rights*, 1948, art. 25)²⁷², those rights who should be enjoyed by all, without discriminations, as necessary condition to guarantee to every individual equal opportunities to promote and develop their capabilities and, at the same time, to reach their potential of psychophysical health;
- how many inequalities in health, between populations and social groups, are unjust because they reflect an unfair distribution of social determinants which, in turn, can be ascribed to a multiplicity of interventions (or non-interventions) and levels or responsibilities.

From this point of view, the notion of “*possible health*” – which will necessarily be different from person to person – is a useful tool to examine

²⁷² Article 25:

- 1) Everyone has the right to a standard of living adequate for the health and wellbeing of himself and his family, including food, clothing, housing and medical care and necessary social services, and the right to security on the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.
- 2) Motherhood and childhood are entitled to special care and assistance. All children, whether born in or out of wedlock, shall enjoy the same social protection.

distributive unfairness and identify, taking into account the empirical investigations on the social stratification of such an essential good, the legal perspective in order to suggest effective corrective solutions.

As highlighted in the previous NBC document on this issue (NBC, 2001)²⁷³, which it's appropriate to mention in order to reconstruct the theoretical and conceptual framework of our work, the concept of *possible health*, as well as being in line with the point of view that values health as the condition to express a variety of capabilities (Nussbaum and Sen, 1993), also presents other advantages. It has the benefit, on the one hand, of linking medical care with an idea of health and prevention that is not reductive, and on the other hand, of introducing what is one of the major problems of healthcare justice: the impossibility of deciding distributive issues, giving everyone the same amount of resources because of the different “natural and social” distribution of illnesses and of psychophysical deficiencies.

It follows, therefore, that we cannot respond to issues concerning health by simply emphasizing distributive equality, but we must rather look for a morally justified criterion for selecting priorities, so that everyone can be offered equal opportunities in reaching the maximum potential of health allowed to those in the same age group. In other words, it is important to support, when distributing limited resources, the most disadvantaged groups and individuals (Rawls, 1971); and this also means a greater commitment in researching measures capable of contrasting the “Inverse Care Law” – the phenomenon for which the availability of good healthcare services varies inversely with the need of the population served – which still seems to characterise healthcare in many areas.

Moving on a different level, still concerning the issue “equality/difference” in distributive justice, it can be helpful to recall some ideas presented in the “classic” essay by the English philosopher Bernard Williams on the idea of equality (Williams, 1973). What William proposes is one of the possible ways to give value, not simply rhetorical value, to the notion of “respect for human dignity”. This author invites us, in fact, to reflect on what can still advocate the statement, apparently tautological, of the equality of men as men: an incomplete but not banal statement, as it serves to remind us of the “significance” of our common humanity. The concept of equality is relational (“equality between who?”) and abstract, in the sense that it presumes a mental process conceptualising the concrete characteristics of the individuals under consideration (“in what, or compared to what, are the individuals in question equal and/or must be considered equal?”); it follows that the judgement of equality always applies not to two or more individuals being the same, but to their equivalence, or similarity, from a point of view that we consider relevant and the relevance of which we are prepared to justify with good reasons (Revelli, 1995).

A pertinent response to tackle the issues linked to the topic under consideration, is that which deems relevant, from an ethical point of view, two aspects of our “common humanity”, from which derive moral expectations we can recognise as worthy of respect:

- the first one unites us for our most common aspects of fragility, vulnerability, mutual dependence: having primary needs that must be met, the ability to feel pain, suffer because of immediate physical causes, as well as

²⁷³ NBC, *Bioethical Guidelines for Equal Access to Healthcare*, 25th of May 2001, <http://www.governo.it/bioetica/eng/opinions.html>.

various situations we perceive or think about, and also the ability to be fond of others and suffer the consequences of such fondness in terms of frustration, or losing the individual we care about. This regards the scope of our moral equality concerning the things we have a vital need for and about which we can suffer, which involves us in moral relationships as the recipients of a certain type of treatment relative to our wellbeing and, at the same time, identifies us as moral “patients”;

- the other dimension our attention is focused on, regards instead more positive aspects, believed to be harder to define, and relative to our ability to reflect on ourselves, have a conscience: the ability to recognise ourselves as beings who have a biographical continuity, beings who aspire to being respected for their ability to responsibly take on commitments and loyalties of various nature, set themselves goals and objectives, make plans and identify themselves with these plans to give meaning and value to their lives (equality in what they can do and achieve) (Veca., 2001). It is the dimension in which we recognise ourselves as “moral agents”. With the warning that being autonomous is not a given, nor is it without different levels; it is largely dependant on society and the particular, relational and emotional environment in which individuals live.

The interpretation of moral equality, which sees as morally relevant the two abovementioned ideas, can offer a guideline to tackle some of the most significant issues of everyday bioethics, but only if we interpret it dynamically. In fact we must look at “patients” and “moral agents” as two dynamic dimensions, which, although often superimposed, can change in time and turn into one another. The boundary between the two conditions is blurred and dependant on the different situations and phases of life. Namely, we must always take into account that there are situations and conditions that can reduce or prevent the ability to be autonomous – like the capacity to plan and make “conscious” choices – and that the relational, financial-social and political context the individual is in, often has a relevant role both in hindering as well as aiding its development, or its recovery once such ability has waned.

There is a sort of deprivation, both from a material and a psychological perspective, beyond which is almost impossible to exercise any kind of choice, due to the lack of access to the most basic resources necessary to carry out a life that is more than mere survival. From the point of view of “public ethics”, a fair distribution of the determinants of health should then have as ideal objective that of trying to, first of all, make sure that no individual and group, or population, can fall below such threshold, acting, for this purpose, on the factors that can be affected by focused social and political interventions of redistribution. This can be a first concrete step to formulate the “right” answer to the challenging question “how much inequality can we accept?”²⁷⁴, which takes for granted the impossibility of a total elimination of the unfair inequalities in human destinies, but not the possibility (moral need) for their significant decrease.

With regards to Italy, the abovementioned objective finds a significant confirmation in the first three Articles of the Italian Constitution, in which freedom and equality have an explicit legal character; they become, in other words, an idea that regulates constitutional politics, because the starting point

²⁷⁴ Cf. C. Arnsperger, P. Van Parijs, *Éthique économique et sociale*, 2000.

here is the acknowledgement of the absence, in effect, of the conditions necessary to fully develop each and everyone's personality²⁷⁵.

1. A particularly “vulnerable” section of the population: women over sixty-five years of age

This premise seemed appropriate to better frame and justify our choice to focus our attention on a particularly vulnerable section of the population, which risks to see their generic and specific health needs underestimated: those of the so-called “elderly” women.

Opening a parenthesis relative to the notion of *vulnerability*, it is important to remember that it was the “*Barcelona Declaration*” – signed in 1998 by twenty-two European specialists, coming from different disciplines and philosophical perspectives, to give value to this notion, as well as those of *autonomy, integrity, dignity*. These are four regulating ideas, useful not only to analyse the crucial issues of bioethics and bio-law, but also to give direction to the current debate on biomedicine and biotechnologies in a legal context, within an ethics of solidarity, responsibility and justice intended as fairness. The principle of vulnerability, which essentially expresses the idea of the limit and fragility of human existence, is at the basis, for those who are autonomous, of the possibility and need of every moral discussion and every ethics appealing to responsibility and care²⁷⁶.

Returning to our topic, without intending to discuss the various classifications of aging, we include in the concept of “old age” the “range of problems” conventionally thought to begin at 65 years of age, which become increasingly relevant with the passing of time and, generally, in our society after 75 years of age²⁷⁷.

Many studies today tackle the issues raised in developed countries by a growing elderly population, but there isn't always adequate recognition of the strategies of cultural, social, economic, biomedical, etc. policies, necessary to counteract the ethical prejudice of “ageism”, namely, so that the elderly population is recognised as a possible social resource and not as a burden encumbering on the whole of society and, in particular, on the younger generations. In a world where the prevalent cultural and media images daily instruct us to “take care of ourselves” in order to fight, at least in our outward

²⁷⁵ Italian Constitution, *Fundamental principles*: art. 3 “... It is the duty of the Republic to remove those obstacles of an economic and social nature which constrain the freedom and equality of citizens, thereby impeding the full development of the human person...”.

²⁷⁶ We must also stress that this notion has both descriptive and legal value: in fact, describing a person as vulnerable means suggesting, at the same time, an ethical response of protection and responsibility towards him/her. From this, the profound link between vulnerability and the ethics of care. But in order for this idea to be more than a utopian principle, it is necessary for society to indicate with absolute clarity what type of vulnerability it intends to focus on and with what resources: in this way, the ethics of care meets the sphere of justice. As it is easy to see, the overall message emerging from the *Declaration* is that vulnerability is, for the most part, due to certain situations and that therefore everyone's commitment must be aimed at reducing it in its different aspects. In this way, we try to make sure that vulnerability is not an element of exclusion but of particular consideration and more care, taking into account the equal dignity, from a legal point of view, of every person and also of those characteristics that make him/her a unique individual.

²⁷⁷ Cf. NBC, *Bioethics and the Rights of the Elderly*, 20th of January 2006, <http://www.governo.it/bioetica/pareri>.

appearance, the signs of aging, whilst life, work and social safety is increasingly precarious for the younger generations, aging is perceived, even by the individuals themselves, almost as a crime; and it is increasingly seen as a process of irreversible losses – of role, status, health, personal relationships, etc. – which leads to more or less severe forms of marginalisation and social exclusion.

All issues, these, which have in any case already been tackled in a previous document by the NBC, concerning the condition of the elderly, in which we urge to “consider in more depth the dignity and the rights due to people in this particular phase of their life” (*Active Aging*) (NBC, 2006).

To integrate the abovementioned document, we have therefore focused our interest on some particular aspects of bioethical relevance, regarding the condition of women over sixty-five years of age, with particular attention to issues linked to the opportunities of accessing social-healthcare goods and services. Namely, we felt the need to adopt the critical perspective that takes into account the difference between sexes in order to highlight, once again, the need to overcome, in biomedicine as well as other fields, the concept of a “neutral” individual, with which we tend to assimilate women and men and, consequently, ignore both their psychophysical specificity and their different needs and vulnerabilities, which change with the various phases of the living cycle.

The awareness of the significance of sexual differences is one of the outcomes of the growing influence of women’s views in bioethics. These views, even in a plurality of perspectives, move from the intention of remedying some of the limits affecting the first phase of bioethics:

- the tendency towards deductivism, of a bioethics based on principles and therefore not very inclined to consider the importance of the context, the situation in which the moral action is carried out – towards which feminine and feminist approaches are instead very sensitive;
- the prevalence of an individualistic-abstract perspective, with the emphasis on rights to the detriment of the responsibility of “care”, in the sense of “taking care”;
- the connection of bioethical debates with institutions – like National Committees – in which women are not yet sufficiently represented (although they are more present today in Committees than in other institutions).

It was especially Susan Wolf²⁷⁸ who highlighted, from a philosophical perspective, how the bioethical debate, in medicine as well, is often carried out on the basis of a model patient who does not exist, has no sex, age, race, status, etc.: a “generic patient”. Namely, no sufficient attention has been given to how the differences between patients can introduce significant changes in the approach to how we know and care for them. In particular, amongst other factors, it was felt that “sexual difference” deserves a more in depth analysis because women live in a society that is still marked by “sexist” attitudes, which tend to not take sufficiently into account how female patients know themselves and their needs, especially if disabled, elderly and alone.

Making room for female differences in bioethics means not only giving particular consideration to the specificity of the woman-patient as the object of care and attention, but also giving voice to the woman’s subjectivity from an ethical and bioethical point of view. The thesis supported by Wolf, as well as

²⁷⁸ S. Wolf, *Feminism and Bioethics: Beyond Reproduction*, Oxford Univ. Press, N.Y. 1996.

other female specialists in the field of bioethical issues referring to the research by Carol Gilligan²⁷⁹, is that the traditional formulation based on the paradigm of rights and self-determination is insufficient, because it does not take into account the relational and environmental “context” of a particular situation. The suggestion of this current of thought goes rather in the direction of an ethics of care inspired to *principled caring*, which takes on Carol Gilligan’s suggestion of integrating rights and care, along the lines later indicated also by other female specialists, like Martha Nussbaum and Virginia Held²⁸⁰. In order to gain a “gender perspective” in bioethics²⁸¹, it is therefore important to fight, first of all, against the idea of an abstract individual, devoid of determinations (and of significant reactions), that is, of those traits that define his/her condition and status. In this perspective we can then say that valuing sexual differences, even in bioethics, if we think about it, is founded on the legal principle of equality, if we give this principle the meaning of recognising the equal value of the differences that are the basic characteristics of a person’s identity²⁸². As already mentioned in the premise, the legal idea of “equality of fundamental capabilities”, presented by Amartya Sen and Martha Nussbaum as the assessment criterion for the different social aspects, takes on this perspective, having as its ideal objective the promotion the self-fulfilment of all the specific and different capabilities of every individual, putting everyone in the best conditions to exercise and develop them.

The choice of limiting our reflection to the situation of elderly women can also be considered as a continuation of the issue discussed in the recent document *Pharmacological Trials on Women*, drawn up in 2008 by the NBC²⁸³, which highlights, in fact, the profound changes women have lived through, and are living through, especially in developed western civilisations, with consequent changes in the relationship between health and illness, always considered as dependent on the “complex relationship between the biological dimension, the psychological as well as symbolic component and historical-social-cultural influences”. With regards to this topic, it is important to mention how gynaecology, in the last few years, has re-directed its function towards being a “holistic medicine for women”, which had been waning with the development of technology. Many currents of thought in this branch of medicine support, for this purpose, the introduction of “*medical humanities*” in university studies and in the continuing medical education (CME) of gynaecologists.

As proof of the need for a new focus on “gender differences”, we can also mention a number of recent initiatives by the Ministry of Health, like for example: the 2005 publication *Women’s health and drugs for women*, the 2007 working group *Gender approach to health*, the 2008 report on *The state of women’s health in Italy*, etc. All signs of a growing sensitivity towards the health

²⁷⁹ C. Gilligan, *In a Different Voice*, 1982. This work began a series of contributions, amongst which those by Virginia Held and Martha Nussbaum, aimed at consolidating an ethical perspective integrating the ethics of rights and regulations with a more contextual and relational moral view.

²⁸⁰ V. Held, *Etica femminista*, Feltrinelli, Milano 1997.

²⁸¹ Cf. L. Palazzani (ed.), *Bioetica e differenza di genere*, Studium, Roma 2007. On the different perspectives of women’s way of thinking in bioethics, see also C. Botti, *Bioetica ed etica delle donne*, Zadig, Milano 2000; G. Marsico, *Bioetica: voci di donne*, EDB, Bologna 2002.

²⁸² Cf. L. Ferrajoli, *La differenza sessuale e le garanzie dell’uguaglianza*, in AA.VV., *Diritto sessuato?*, monographic number in «Democrazia e diritto», No. 2, a. 1993, pp. 49-73.

²⁸³ NBC, *Pharmacological Trials on Women*, 28th of November 2008, <http://www.governo.it/bioetica/eng/opinions.html>.

problems of the female population and, clearly, of the intention of proceeding to a more in depth analysis in view of planning interventions, in the fields of prevention and healthcare, which take into consideration the relevant “differences” between the various sections of the population.

Putting emphasis on a different perspective does not mean, therefore, only focusing on the care of women, as the object of a commitment from the medical field, paying attention to feminine peculiarities, but also making room for women as an active resource, their experience of empathy, relationships and care, which allow us to look differently at the issues of care with regards to life and health.

2. General observations on the condition of elderly women

In light of what has been said so far, we feel that it is important to recall attention, also in view of future interventions in healthcare and social policies, on the needs that are particular to the section of the population consisting of women over 65 years of age.

Here, we report a variety of data and issues, in the awareness that:

1) they also raise bioethical questions, which are pertinent to the daily experience of a condition of life that is more and more widespread, rather than to the exceptionality of particularly difficult moral cases;

2) in any case “the third age is heterogeneous with regards to self-sufficiency, physical and mental health, quality of life” and “age in a chronological sense cannot be the only criterion to identify healthcare and/or therapeutic choices and exclude anyone from therapies aimed at curing or prolonging life” (NBC 2006).

The 10th of December 2009, ministers Sacconi and vice-minister Fazio presented a Report on the State of Healthcare in Italy. In it, it is stated that the old-age index (the relationship between the population over 65 years of age and that below 15 years of age) grew to 143, making up 20.1% of the population. Women live longer than men. For this reason they make up most of the growing elderly population in Italy. Considering the number of 65 years olds, and over, in the population, women make up 58.1% of it compared to 41.9% of men²⁸⁴. In addition life expectancy at birth continues to grow for all, but even more so for women (life expectancy has increased to 80 years at the beginning of the 1990s and it is 84.2 years at the moment, compared to 78.4 years for men). The phenomenon of the ageing of the Italian population is therefore strongly marked by a gender qualification²⁸⁵. It therefore becomes evident how, in time, the number of women going from aging to being “elderly” will increase, and they will find themselves having to tackle a physical

²⁸⁴ Because of this and other data, and other interpretations of them, see the report by Carla Collicelli, *Donne e salute in Italia: la sofferenza delle donne anziane*, Presented by the NBC's working group; the report is accompanied by many tables elaborated by the Censis on Istat data. Some of these tables can be found in this document's appendix.

²⁸⁵ Taking into consideration ISTAT data relative to the life expectancy of those born in 2007, with regards to their sex and the region they live in, we can also observe that overall life expectancy is higher in the centre and North of Italy than the South and the Islands: e.g. men's life expectancy has increased to 79.6 years (Umbria) and women's to 85.2 years (Marche), whilst Liguria on the 1st of January 2006 was the Italian region with the highest percentage of women over 65 (30,2%) and of men also over 65 (22.7%). See ISTAT data in Table 6, attached to the contribution by Francesca Loporcaro.

metamorphosis that can create confusion, to the point that in some cases it causes – we will discuss this later – an identity crisis, an inability to identify themselves with their aging body, to which can follow depression and the consequent shrinking of their emotional and relational circle (cf. Attachment 1).

Women over 65 years of age, in addition, in many cases live in a situation of loneliness. This is evident by the considerable growth in the number of families which comprise of only one member. There are many causes for this phenomenon, but there is no doubt that a relevant cause is the fact that the growth in the average life expectancy of the female population is, as we said, higher than that of the male population. To this, we must add the fact that usually women are younger than their husbands, and therefore the probability that they will find themselves living alone for a number of years, as widows, is very high. If, as well as widows, we consider also unmarried, separated or divorced women, we reach a considerable figure: 56.6% of Italian women over 65 years of age live alone²⁸⁶. Naturally, this situation can also be deliberately chosen: it is the case of the *singles*, frequently talked about in the public debate, which involves, to be honest, especially younger sections of the population, whilst the loneliness of elderly women is mostly endured and in most cases it is a source of discomfort and suffering. Relational deficiency is often marked, as well as by the loss of the husband, by the infrequent presence of the children, either because they live far, or because they are absorbed in their work and the intense pace of life of their new family.

With regards to income we see, so to speak, a double discrepancy: between the elderly and the rest of the population and, amongst the elderly, between women and men. There is in fact a considerable difference between the income of the elderly and that of the rest of the population: the second is on average higher than the first; the difference increases if we consider the income of women over 65 years of age. The lower income available to them worsens a condition that can be, already in itself, a source of serious discomfort: to the frequent loneliness, we must add the difficulty of financially covering daily or unexpected medical expenses, which – as we know – increase considerably at this age.

More in general: “The incidence of poverty is above average (13.9%) in families where at least one member is over 65 years of age and it reaches the highest level when there are two or more elderly family members (16.7%). The relative discomfort is more evident in the Southern regions, where the average incidence is 21.3% but 28.2% of couples with one person over 65 years of age are poor and 25.7% of elderly people are poor and alone”²⁸⁷.

The factors mentioned so far, affect what we could call their perception, on the one hand, of their personal “happiness” and, on the other hand, of their health conditions. With regards to the first aspect, “elderly women who are alone”²⁸⁸ for the most part (73.7%) declare to be in a very adverse economic-social condition, to be little or not at all happy, to have a social life that is little or not at all gratifying. The participation to leisure and cultural activities during their

²⁸⁶ See table 3 of the contribution by C. Collicelli, *Donne e salute in Italia: la sofferenza delle donne anziane cit.*

²⁸⁷ National Healthcare Plan (2006-2008), p. 70.

²⁸⁸ It is the effective expression suggested by the Censis Foundation Survey and by the Schering Foundation (2006). See also illustration 1 with regards to the so-called “feeling of happiness”.

free time is very low; this is due to their low income, but also, often, by a lack of relationships as well as initiatives and opportunities offered where they live.

However, if we examine the issue from a historical perspective, a different way of looking at elderly women and their health/wellbeing can emerge, thanks to the self-awareness process that in the last few years has by and large affected the female world. Women are about to go through their third and fourth age in conditions that were completely unheard of in the past. This is what female sociologist Marina Piazza writes, expressing the self-perception of some sections of the female population, which today face these phases of life: “More educated, more independent, healthier, wealthier, aware of their longevity compared to past generations; with an experience of public life that is incomparably more intense”²⁸⁹.

Nevertheless women still suffer, in comparison to men, an economic and social disadvantage, particularly serious today for women over 70/75 years of age. We also cannot forget how women’s “weakness” is still for the most part symbolic, as the image of the feminine is traditionally linked to their physicality and the ability to procreate: when the body declines and the reproductive function ceases, the female identity itself can enter a state of crisis. It is true that today a new social image of the feminine is gaining pace: the woman always beautiful and in shape, who stops time with plastic surgery and still keeps up with the pace of life. In truth, the imperative to “stay young” risks to be the other side of the same coin: the social “invisibility” of the elderly woman who ages, from which we try to escape.

There’s however a different world, namely, different ways of thinking about ageing through “the eyes of a woman”. One of these is seeing old age as a season in which women can achieve a new freedom and not be “feminine masks” anymore²⁹⁰. And there is another, maybe more sensible viewpoint, because it does not deny the pain of losing a body that was once desirable and able to have children, but tries to elaborate it, transforming the individual ability to reproduce in a relational and social capability. The female experience of “taking care” of the family (which does not exist anymore) turns into more focus on themselves and their health and in a renewed pleasure in weaving relationships with others. Especially with other women. If it’s true that a high percentage of elderly women are alone, often they can be less “isolated” than the men in the same age group. Women who today enter their third age belong to the generation that invested in female relationships. This is not only true for the *singles*, or separated or divorced women, as even many women who were part of a couple, by an large, did not follow the model of the “self-sufficient” family, inward looking and exclusive (which is in a state of crisis since the beginning of the 1970s).

Highlighting these aspects of female subjectivity does not mean underestimating the burden of the “criticalities” and reaching the rhetorical idea of a “brilliant second part of life”, which can betray a fantasy of omnipotence. It is instead a way to take on the complexity and contradiction of the representation of elderly women. Most of all, it is a way to highlight women’s subjectivity, particularly useful to direct social intervention. The work aimed at

²⁸⁹ M. Piazza, *Le ragazze di cinquant’anni*, Mondadori, Milano 2000, p. 37.

²⁹⁰ This is what Carolyn Heilbrun states, when she writes: “For most women, the onset of old age brings all those liberties men have always known and women have never had... and first of all not having to impersonate women” (Carolyn G. Heilbrun, *Writing a Woman’s Life*, W.W. Norton & Company Inc., New York – London, 1988).

promoting “possible health” must develop individual resources rather than highlight (even to protect them) their shortcomings. It is the point of view of *empowerment*, the approach that in the last few decades contributed in re-directing the action towards so-called “weak” individuals (women, the young, the elderly), starting from the critical assessment of the political tradition of mere “protection”.

3. Observations on the state of health

The vast amount of medical-psychological literature on ageing, normal and pathological, is today grown to such a level that it is difficult to summarise in a few statements what we know about this issue. Ageing is in fact a complex process, which involves not only neuroendocrine structures, but each organ and apparatus. It is a progressive process that evolves in time differently from individual to individual and leads eventually to the loss of some functions in specific organs, first of all the brain, which is widely influenced by personal history and the culture in which each of us moves. It is not always easy to assess the effect of the environment in which we grow up, but no-one today denies the “plasticity” of our CNS, through which the brain captures external images, elaborates them by “heating them up” in light of our emotional investments and feelings, and fixes them in the neuronal circuits. All this determines a progressive change in the individual’s personality, even if each person always maintains his/her unique and inimitable identity. Without a doubt, amongst the factors that remain, there is the fact of belonging to a gender and, clearly, the gender difference in the cognitive and emotional sphere, physiological differences which not only lead to a dissimilar incidence of pathological phenomena and different reactions to them, but also dissimilar ways of managing our own lives. In addition, as shown by recent clinical studies analysing pain in its different components – reception, transmission, modulation of transmission, perception – sexual difference affects the way we experience it. It has in fact been highlighted that women – as well as responding differently to analgesics – feel pain much more than men, a fact that has to be considered not a weakness, but a strength: an adaptation due to a higher exposition, a protective mechanism that contributes to maintaining life.

We want however to stress that human beings are not only the product of biology, but also of history. What we experience, anchored in our consciousness and kept in our memory, full of conflicts between desires and fears, changes our way of thinking, aids or hinders the onset of so-called “positive thought” and generates “divergent thought” at the basis of our creative capabilities. With old age our mind finds it more difficult to perceive the changes in a world that is in rapid acceleration, even though, when it loses nervous cells, our brain uses new structures to link the nervous centres, which flourish with experience.

It is today possible to understand the ageing process in both men and women and, at the same time, consider the fourth age not only as a “period in which we are what we have given”, but also – we repeat – as a phase of life that can still bring positive change. This phase has its peculiarities and its specific physiopathological states, which affect the intrapsychological and relational world, different in the two sexes, male and female, but also in comparison to other phases of life.

The increase in life expectancy has given growing room to geriatrics, a young science as a specialisation, although much older than paediatrics as a medical commitment. In fact, medicine has only in the last few decades come away from a negative judgement of this phase of existence (*senectus ipsa morbus est*) and today, after having contributed to increasing its duration in time, its commitment is that of “giving life to the years”. In other words, we are seeing the change from a medicine “of organs and apparatus” to a medicine of the person, which as well as curing, takes care of the elderly, trying to help them “to live better” and evaluating our existence positively even when we are old.

Assessing our state of wellbeing is today seen, even in economics, as a fundamental factor to judge the appropriateness of social-healthcare interventions. There is, in fact, a difference between the sexes concerning their state of health and also their assessment of it. Their own state of health is perceived by elderly women as worse, on average, than that of men, especially with regards to pathologies of the third age, and not only those that are typically female like osteoporosis and thyroid, breast and vulvar disorders. As Carla Collicelli states, “the data that women declare themselves as “not having good health” stresses the fragility of the relationship between women and health, and especially in the last phases of life, women tend to have more pathological events compared to men”²⁹¹. This is proven also by women’s more frequent recourse to healthcare services, from hospital admissions, A&E and emergency doctors, to specialist and preventive check ups²⁹².

From what we have said so far, we can infer that women over sixty-five years of age are particularly exposed to the negative effects of inequalities in healthcare, as well as to more general conditions of social inequality. Without wanting here to make a detailed sociological analysis, we can state that inequalities in healthcare are worsened, indubitably, by the lower economic capabilities of elderly women and/or by an allocation of resources which is strongly imbalanced regionally and nationally. However we must not underestimate also the difficulties (or even impossibility) of accessing healthcare services due to insufficient or no adequate information and, more widely, to an organisation of the healthcare system that is not always able to respond efficiently and appropriately to the growing needs of the elderly (despite the fact that healthcare expenses concentrate, already at present, in the last ten years of life).

An inadequate organisation of healthcare and a lack of information, advice, direction, can produce particularly distorting effects in a section of the population that, due to age and sex, often lives – as we said – in conditions of loneliness with regards to family. Those who are alone and maybe physically and/or mentally debilitated, or do not have the cultural tools to act autonomously, finding themselves unable to take advantage of the chances and offers that the system of services, at least in some regions, makes available. The phenomenon of the so-called “hidden rationing”, still too often

²⁹¹ C. Collicelli, *Donne e salute* cit., p. 2.

²⁹² Regionally, 2005 data tell us that the higher percentages of people over 65 who declared feeling “ill or very ill”, come, with regards to the female population, from Sicily (33.4%) and, with regards instead to the male population, in Basilicata (22.8%). More in general, still in this age group, the gender difference in mentioning a health discomfort is higher in South of Italy, with 33.2% for women and 27.8% for men. In North of Italy, both in the East and West, the discomfort seems instead to decrease, whilst, at the same time, life expectancy increases. *Ibid.*, table 44 (integrated).

present in healthcare (as already stated by the NBC in the 2006 document), creates then situations of non-transparent deterrents, aimed at discouraging especially elderly patients, - even more so the female population – encouraging them to give up requests of assistance and care. Amongst the deterrents we can list: difficult systems to book specialist visits and diagnostic analysis, or in any case any barrier that in effect makes it particularly difficult to access healthcare services; the lack of clear and easy to understand information about the way the services are organised and the different types of procedures available; the mechanism of deferment, the most typical example of which is represented by extremely long waiting lists; the so-called “dilution” mechanism, namely, discouraging demand by reducing the perceived quality of the procedure; forcing people to move area in order to have some diagnostic or therapeutic procedures; and, not last, the presence of two spheres of activity: one for everyone and one for paying patients, etc. (NBC, 2006).

The lack of family ties, late maternity, the tendency to have only one child, widowhood (6 widows for every 1 widower in the fourth age) means that elderly women are increasingly alone, also when facing medical issues, which affects the duration and, most of all, the quality of their life. This is particularly evident in Italy, which is at the top of the list with regards to the age of mothers having their first child. This also means a shrinking of the function of “grandmother”, which affects the growing generation as well as women in the second part of their life (girls who are born today have a life expectancy of 90 years). The recognised social role of the grandparents, which can be so rich in that humanising emotion that is tenderness, helps not only to overcome the sense of loneliness, but it can also have positive effects concerning mood swings, cognitive disorders and alterations in mnemonic processes. Today, unfortunately, this important emotional-relational contribution is increasingly lacking, due to the growing age gap between grandparents and grandchildren.

The causes of inequalities in healthcare – we must stress again – are therefore not only financial, even though these clearly have an impact. As Collicelli states: “the “healthcare divide”, in any case, both according to the oldest interpretations, which saw it linked especially to the material conditions of life, and the more recent one, which considers it linked to the healthcare is organised and especially information and advice, is still macroscopic in Italy and poses very serious problems from the point of view of the collective decisions to take and implement.”(Collicelli, 2007)²⁹³.

Given that ageing is linked to lifestyle and the experiences each person has during their lifetime, as well as to their endogen component, which is their genetic inheritance, we felt it appropriate to focus, in Attachment I, on some pathologies which, in frequency and quality, are typical of women over sixty-five years of age and in particular women in their fourth age.

Today, a vast amount of research is carried out on the pathologies that affect not only the duration of life but also its quality, measured in terms of efficiency, ability to move and act in our environment and, most of all, of having ideas and affection, a rich intrapsychological and relational world.

Although gynaecology, intended as gender medicine, has roots that are lost in history, it concentrated its clinical attention on the important *climacter*, the seventh of the seventh season of the life of women, only in the middle of last century. This period was chosen, by a gynaecology “focused on

²⁹³ C. Collicelli, *Donne e salute* cit., p. 32.

prevention”, as a strategic period to start therapies and give suggestions on how to live better during the increasingly long years following. Andrology appeared only after, and it is more focused on the problems linked to sexual relations and not so much, and exclusively, to the reproductive role. At the recent World Congress in Vienna (8-10 September 2009) this science asked “*Why men die earlier?*”, highlighting how the “weaker sex”, once the incidence of illness due to pregnancy and childbirth is reduced, is, from this point of view, “stronger” than the male. Immediately stressing, however, how this discrepancy often affects a couple’s relationship and in particular women, who find themselves more frequently having to take care of their partners.

Nevertheless, despite their longevity, we find (cf. Attachment I) amongst elderly women a significantly higher incidence of debilitating diseases – fractures due to osteoporosis, rheumatoid arthritis and osteoarthritis, strokes, incontinence, cancer – than men of the same age. The same can be said about progressive disabilities due to psychomotor deceleration, episodes of confusion and dementia of the Alzheimer’s type, the incidence of which increases exponentially with time, although cardiovascular and osteoarticular diseases are, in any case, the most frequent causes of illness in women over 65 years of age.

We can well understand how the assistance of the social-healthcare system, which is involved in the health issues of the various seasons of human life, should have, in the presence of limited resources, measures apt at improving this clinical situation, which will interest an increasingly large section of the population. Socio-political and healthcare intervention would however need competent doctors, sensitive to the unbreakable link between biological and psychological phenomena, namely, able to see the person as a complex psychophysical unit and not as a system of organs, almost autonomous from each other, on which individual “specialities” act separately. There therefore needs to be a profound change of perspective.

Consequently, from a bioethical point of view it is desirable, we repeat, for social and healthcare policies to focus more on the quality of life of the elderly female population, which is progressively growing, putting in place measures that would allow:

- 1) correct and timely information about the risk factors of illnesses and the best ways to keep them in check and prevent incapacitating poly-pathologies;
- 2) an healthcare system that is more aware of the fragilities of this delicate phase of our existence, differentiated and shaped on the specific needs of women in the whole country.

The hope is that in the near future we can reach a significant increment in the number of self-sufficient elderly individuals, who have a better quality of life thanks to the improvement in their living conditions, the progress of medicine, prevention activities, but also the dissemination of a new culture in support of “*active aging*”.

4. Differentiated offers for the elderly by Public Bodies

At the end of 2009, a new Pact for Health 2010-2012 was agreed upon by the Government and the Regions. This is a financial and programmatic agreement valid for three years, which regards the cost and programming of the NHS, finalised at improving the quality of the services, promoting an

appropriate performance, guaranteeing a unified system. The Government and the Regions have identified the strategic sectors in which to operate in order to improve regional healthcare services and guarantee the satisfaction of the citizens' needs and at the same time more control over expenses. With regards to the elderly, the focus has been placed especially on gradual disability over the years. The main cause of the marginalisation and then isolation of the elderly is not however due only to their possible disability, but it must be identified, as we have seen, in the loss of their social and productive role, which causes a decrease in their financial potential, a feeling of loneliness and finally, not uncommonly, a strong sense of uselessness accompanied by a loss of self-esteem. Moreover, the Pact highlights a need to know these factors, which then affect the regulations, recognising that the need of elderly people are also by and large not only "material". Consequently, the *Guideline for the realisation of an integrated system of interventions and social services* (Law of the 8th of November 2000, No.328) expressed the clear intention of intervening on the different sectors of social life, integrating – through the implementation of a system of local networks – the services to the person and to the family, anticipating financial incentives aimed at optimising the resources and avoiding clashes of authority and the sectorialisation of the responses. This overall vision has been taken on by the three-year Plans of the National Healthcare Service agreed upon so far, which have never failed in highlighting how the needs of the elderly must be at the centre of an healthcare service that is varied in its methods and ways of care (unfortunately not always carried out or made possible): this is the so-called "third economy", aimed at making sure that "the elderly who are not supported by a family can, with their own economic activity, express their freedom and at the same time contribute to the individual and collective well-being"²⁹⁴. As already highlighted by the National Bioethics Committee (NBC, 2006), when we talk about the elderly we cannot reduce the discussion merely to demographic and economic data without taking into account their equal dignity in comparison to other citizens, regardless of their age, their health conditions and the contribution they are able to make, because their presence in itself contributes to the well-being of society. And more, alongside the Report "*World Population Ageing 2007*" by the United Nations – which states that "there are numerous ways in which the elderly can express themselves and feel fulfilled: continuing to participate to family life, practising voluntary work, acquiring new knowledge, enrolling in courses, expressing themselves through arts and crafts activities, participating in community organisations and associations of the elderly or religious, recreational, touristic activities, working part-time or being part of the political life as informed citizens..."²⁹⁵ – a variety of ways to participate to activities, courses or other have been planned, and in some cases realised locally, suggested by the various local Administrations (Attachment II).

According to the *White Book on the future of the social model* by the Ministry of Labour, Health and Social Politics, published in 2009, which register the data of the "the level of generational separation of the elderly who, more and more often, live only with other elderly people, in particular in rural areas that are going through a depopulation", this new situation "imposes

²⁹⁴ M. Trabucchi, *Perché Terza Economia*, in: Fondazione onlus socialità e ricerche – *La Scienza dell'assistenza. Terza Economia sempre più valore dalla terza età*. Quaderno No. 2, The European House Ambrosetti, 22nd of January 2008, p. 4.

²⁹⁵ www.unpopulation.org.

policies that are specifically aimed at the so-called third and fourth age and at promoting aging in good health thanks to the active prevention of the risks linked also to lifestyle. It is about guaranteeing a condition of physical and mental well-being, ensuring that the impact on the system of social protection can be managed fairly and efficiently” (see attachment).

5. Conclusions

From the previous analysis emerges how simplistic it is to identify only one element of criticality that marks the life of women over 65 years of age. Certainly, the economic and material aspect has its considerable importance: the decrease in income is immediately reflected in a worsening of the quality of life, especially when there is an increase in expenses due to the onset of numerous chronic pathologies. The fragility of psychological-physical health is therefore a further element that exacerbates economic instability; proof of this, is the recourse to cures and drugs that are often costly, having to undergo specialist medical examinations and periods of hospitalisation, the need to request the assistance, partial or continuative, of people outside of the family circle (“carers”). This way, another problematic factor emerges, represented by loneliness with regards to family and the not-infrequent lack of relationships.

The lack of continuative relationships, economic uncertainty, the worsening of the state of physical and psychological health are factors that must not be seen as excluding each other; if anything, they intertwine to the point of seriously compromising people’s overall well-being. According to a line of research that in the last few years has been promoted as part of economics and social sciences²⁹⁶, it seems reductive to link personal and collective happiness exclusively to the growth of economic and material wealth, as something that can be quantified and measured on the basis of some objective parameters, like those measuring income and GDP. A person’s *well-being* is rather due to a variety of aspects. With regards to this, Amartya Sen could state that the standard of living is an issue of *functionings* and *capabilities*, and it is not immediately an issue of wealth, services and belongings²⁹⁷.

Human beings appreciate a variety of functions: from the most basic ones like being adequately nourished, being in good health, being able to live without privations, to more complex ones like respecting themselves, contributing to community life, wanting knowledge; but what is most important is that they then have the *capability* to concretely realise these functions. Again, it is not sufficient giving them an availability of material goods in order to be able to talk about social well-being, nor is it sufficient to introduce a re-distributive principle in order for the social situation to be considered right; even more important are the concrete capabilities the individuals have of actually being able to take advantage of these goods and pursue their aims. Without considering these capabilities, equality is empty and abstract. Freedom becomes real when

²⁹⁶ A considerable contribution to this line of research has been given by the Nobel Prize for economics Sen and Kahnemann. The data were presented by L. Becchetti in a contribution to the NBC’s Working Group and are published by the author in *Non solo homo oeconomicus*, 2008.

²⁹⁷ Cf. the fundamental essay *Capability and Well-Being* by A. Sen, which can be found in M. Nussbaum and A. Sen, *The Quality of Life*, cit., pp. 30-53).

individuals effectively have capabilities that they can concretely exercise in order to be able to carry out their choices.

Transferring these considerations to our issues, we can easily see how the well-being of women over 65 years of age is threatened by the weakening, or the loss, of some important capabilities. Even the difficulty of enjoying some fundamental goods compromises *life flourishing*; amongst those, we must without a doubt mention the so-called relational goods, due to the value and the intensity of the relationships they are able to have with others. If the well-being and fulfilment of elderly women also depend so strongly from the possibility of enjoying significant relationships, it follows that “material poverty and illness cannot be cured only with economic help and drugs, but are effectively prevented by creating conditions that support relational investment”²⁹⁸.

5.1. Suggestions – hopes

The new dimensions of old age require the elaboration of new social and healthcare policies. As we have said, family structure has profoundly changed; generational relationships and those between members of the same generation are changing and even the world of work is going through a profound transformation, with a new pace at work and more mobility, which considerably reduces the time destined to family activities. The elderly, therefore, face great instability, which causes uncertainty and discomfort. It is for this reason that we think it is quite useful to suggest new types of services for this age-group, in order to achieve better equality their access and use.

I. Case manager

Starting from taking into account the situation described in this document, we propose to give emphasis, in social and healthcare policies aimed at the elderly, especially women, to the figure of the *Case manager*.

Case Management has been used, since its first applications in social services, in two main ways:

- Supporting processes of de-institutionalisation and the foundation in Italy of some social-healthcare services;
- Guaranteeing the link and coordination of both the different individuals working in medical services and assistance, and between them and the patients.

This second function has become necessary when it was noticed how individuals (for example mental health patients) coming out of hospital, found inadequate and uncoordinated alternative services. Rejecting the logic of institutionalisation, with its risks of withdrawal and repression, did not automatically translate in a more humanising intervention, especially for the most severely disabled and suffering individuals.

Following the experiences in this field, developed in the United States since the 1960s, and the relative theoretical reflection²⁹⁹, the Case Manager has been entrusted with the following duties and objectives:

²⁹⁸ L. Becchetti et al., *Income, relational goods and happiness*, in “Applied Economics” number 2, 2008.

²⁹⁹ Cf. B. Bortoli, *Il lessico della community care*, in R. Di Marzo and L. Gui (ed.), *Proposte per l'integrazione nei servizi sociali e sanitari*, Franco Angeli, Milano 2005, pp. 70-90; B. Bortoli, under “Case Management”, in *Dizionario di servizio sociale*, diretto by Maria Dal Pra Ponticelli, Carocci-Faber, Milano 2005, pp. 95-101; M. Payne, *Case management and social services*.

1. “ensuring continuity of care through services, at any moment or periodically (for example when the individual cyclically moves from the institution to the community, between admissions and discharges);

2. Ensuring that the services respond to the entire range of an individual’s needs and to their variation in time, even for a whole lifetime, if necessary”³⁰⁰;

3. Helping people to “access the necessary services, overcoming the obstacles linked to the access requirements, regulations, administrative decisions, procedures;

4. Ensuring that the services (...) are carried out adequately and quickly and do not unnecessarily overlap”³⁰¹.

The figure of the Case Manager is present (although not always put into action) in the National Healthcare Plan 2003-2005, as a point of reference for the elderly who are alone, and has the task of assessing and meeting their needs, using the network of healthcare and social-institutional services, or friendship and solidarity networks. In a complex society like ours, there is certainly no shortage of offer, as we have said, of social-healthcare services and support groups, also voluntary, which can be of help to the elderly who find themselves in difficulty; what is lacking, however, or what is at least felt to be a primary need for this age-group, is a figure of reference, someone they can trust. Too often, the people revolving around individuals of a certain age overlap or multiply, which leads to a sense of insecurity and lack of care. The figure of the Case Manager aims to meet the need of focusing on one person the desire for a “stable relationship”, which is the foundation of a mutual human contact. Its role is also relevant with regards to guiding the person they look after in both understanding and decoding medical language, in organising healthcare, from booking to undergoing the medical check-up etc., and, finally, in their capacity to involve the patient’s family circle. To ensure this task of involving the family members, and, more widely, friendship and solidarity networks, we should avoid the possible risk, mentioned in critical literature, of de-responsabilisation; the Case Manager intervenes not to take the place of family and friendship networks (when they exist), but to increase and support their contribution, by encouraging it and coordinating it. This role does not intend to add another link to the chain, which is already complicated and muddled by its bureaucratic structure; if anything, it aims to lower the incidence of bureaucratisation and depersonalisation, accompanying the person they look after and helping him/her extricate him/herself from the jungle of the services offered. If this role can be a real support for National Healthcare System users in general and for the elderly in particular, it will be of even more help, in light of what we have said above about the condition of women in their fourth age, for this section of the population, becoming the interpreter and guarantor of their particular needs in the social-healthcare field.

Finally, the bioethical importance of the Case Manager cannot be overlooked: it is aimed at individuals with high health risks, in most cases having to face, alone, fundamental questions about end-of-life issues; the person in this role will have to be prepared – with specific training adequate to carrying out its different duties – also to tackle bioethically such eventual situations: often, in fact, poly-pathologies are accompanied by a latent (or even

The implementation of individualised programs of assistance in community care (1995); P. Donati and F. Folgheraiter (ed.), *Gli operatori sociali nel welfare mix*, Erickson, Trento 1999.

³⁰⁰ B. Bortoli, *Il lessico della community care*, cit., p. 84.

³⁰¹ *Ibid.*

apparent) depression, which reduces to a minimum the reaction to any type of medical intervention.

II. Medicine and healthcare that are “tailored to women”.

We hope the Regions will give particular importance to the type of social-healthcare interventions, specifically with regards to female’s problems, also in view of the public’s perception – on the basis of the parameters agreed upon and judgements of merit by the “assisted” female patients – of the hospitals and the healthcare structures that focus, as well as on the quality and appropriateness of the care given, also on investigating and protecting the specific needs of female patients, their particular psychological, relational and informative needs, in those delicate moments in life when fragility and insecurities manifest themselves more often and they are increasing with time³⁰².

The final hope is, therefore, that we proceed to a more in depth knowledge of the different social and healthcare services actually found in Italy, also at the local level, aimed at the male and female elderly population, and that, in the various areas of Italy, the offer of healthcare services *right for men and right for women*, is incremented and more adequately distributed, taking into account the particular needs of a society where people experiencing the problems specific to the fourth age will be increasingly high in number.

³⁰² As well as some initiatives by public bodies (which we mention in Attachment II), there are today also associations and private bodies, and scientific associations (first of all the S.I.G.T.) which are committed to the development of a medicine for women.

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ATTACHMENT I

The incidence of pathological alterations in women in their third and fourth age

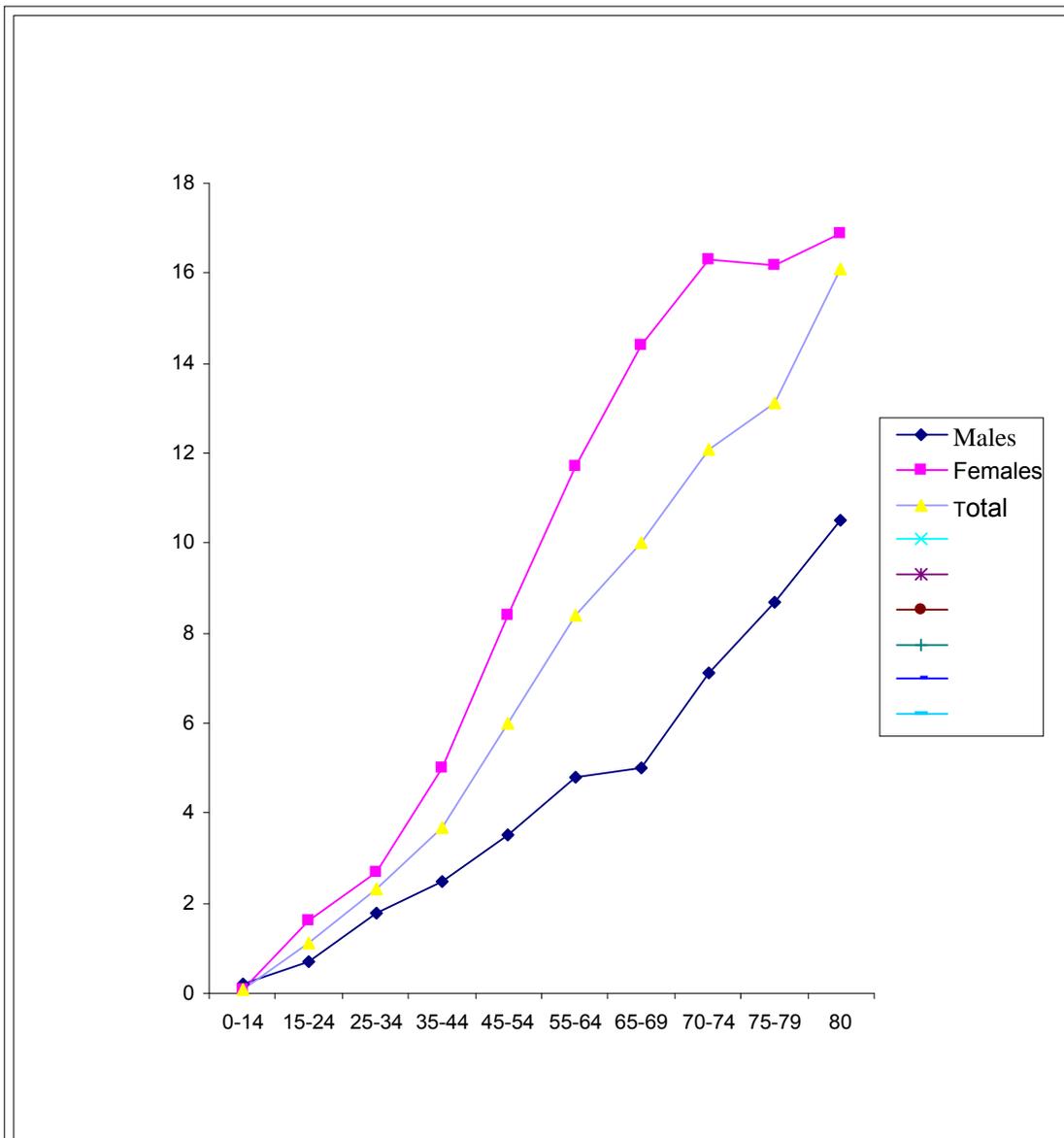
Here, we take into consideration some significant data regarding pathologies that concern especially women over sixty-five years of age, keeping in mind, as we have already said, that physical and psychological pathologies influence behaviour, relationships and, most of all, how we perceive our well-being. The endocrine tempest caused by the disappearance of feminine gametes and the consequent alteration of the steroid and ovarian biosynthesis, which leads to the cessation of the menstrual cycle (menopause), has considerable repercussions on the function of the main female organs, first of all the brain, accelerating the processes of *friability* that is typical of ageing. Although we don't deny the negative effect due to the decrease in estrogens (and partially also androgens) in women, we must however differentiate the post-menopausal period (50-52 years of age) from the one we are considering here (over 65 years of age).

An important syndrome of the last seasons of life is the so-called "*friability*", a clinical state that is inevitably linked to old age. It is a syndrome with factors that can be diagnosed and a peculiar clinical history but also growing therapeutic possibilities. It is characterised by a decrease in the functions of numerous apparata, which leads to a progressive inability to react to stress and accidents, with a consequent increase in illnesses and mortality (AGOG, VIII 2009). The syndrome is also characterised by a so-called "chronic tiredness"; it is easy to get tired, due to the decrease in muscular mass with a corresponding and considerable weight loss (around 6 Kg in a year), a decrease in stride and pace, intolerance or inability to deal with different occurrences, loss of self-esteem and a subjective perception of a state of indisposition, as well as an increase in chronic pathologies (osteoarthritis, autoimmune illnesses, etc.). The "fragility" affects women more than men. One of the consequences is *disability*, defined as a loss of the ability to maintain one or more functions necessary for an autonomous life, independent from the assistance of others (e.g. difficulty of movement, vision, hearing, speech, etc.). This syndrome affects 16% of women between 65 and 74 years of age, increases to 31% between 75 and 84 years of age and it affects more than 50% of women over 85 years of age.

From a nosological point of view, and a perspective of preventive and therapeutic efficiency, is however useful, even in summary critical examinations like ours, to discuss some "pathologies" separately. Let's examine first of all neuropsychological illnesses. The "mental health of elderly women" must be assessed not only in strictly biological terms (CNS nuclei and centres, neurotransmitters, etc.), but even activating the capacity to relate to their internal world and their potential emotional-cognitive resources, which should be developed and directed at the so-called "positive thinking" (Snyder and Lopez, 2002), which is the antithesis of what current cognitive theories define as the main characteristics of depression: "negative view of the self, the world and the future" (Clark and Beck, 1999). The possibilities of intervention to facilitate this trend – which should be consolidating the sense of the lasting value of our existence – are however hindered by the fact that a multiplicity of factors come to play in its genesis and development, both of a biological type,

including gender difference (Roysamb et al., 2002), as well as biographical and cultural.

Ageing, overall, involves the onset of emotive as well as cognitive pathologies: these pathologies, which are often impossible to distinguish from each other or are at least strictly interlinked, affect, as we have said, more women than men and concern a number of women that grows with age. In the graph below (Onda, 2008) – which moreover does not differentiate between the two main mood problems, depression and anxiety, and does not analyse their intensity – it seems already clear that the incidence of these pathologies on the female gender, during a whole lifetime, is significantly higher than on men.



Graph 1. Incidence of anxiety and depression mood pathologies at different ages (ONDA 2008)

Only in old age the pathology rate grows more rapidly in men, presumably for the fall in the quality of their mood due to the loss of a productive and social role. As already documented (Roger et al., 1984), in women persists a higher incidence of episodes of depression, often temporary and not requiring therapy. The worst depression, which affects more than 10% of women over 65 years of

age, is instead a serious psychiatric problem, which cannot be analysed in a few lines, and we mention it only to highlight its importance in daily life.

Similar considerations have to be made for the cognitive problems that go under the name of dementia, in its various forms. This affects more women than men of the same age, even in its most known variety (Alzheimer). Dementia, due to the cerebral damage caused by the destruction of nervous cells, affects 20% of people over 80 years old and 50% of those over 90 (Hy et al., 2000). Here, we simply stress how this pathology affects abstract thought, the ability to resolve daily problems, the logic to construct a speech and long and short term memory (ACOG, VIII 2009). Anyway, we must add that often the most elderly have memory problems (called *benign senescent forgetfulness*), which are also shown in tests; in similar cases, we must reassure the person concerned that this frequent phenomenon does not lead to dementia, it is not the first step in that direction.

Episodes of sudden “delirium” (sudden manifestation of mental confusion, marked disorientation, short term memory loss, various levels of lack of consciousness and mental confusion) can be seen sometimes in elderly women in the post-surgery phase, but also in hypoglycaemia, lack of oxygen due to anaemia, alteration of electrolytes, use of analgesics, CNS drugs, especially diazepam, etc. The phenomenon can be treated and it is reversible, but it needs very costly specific treatments by highly qualified specialists (Leslie et al., 2008).

In addition, changes in the hormonal levels of estrogens and progesterone seem to have an important effect on the psychological condition of women, even if the data is contradictory in literature. Depression manifests itself more frequently in those phases and ages in which there are hormonal changes: puberty, menstrual cycle, childbirth, immediately after the menopause. This last one in fact constitutes a moment of crisis, characterised by profound changes, internal and external, in the different areas of female reality. A woman’s social role is modified, starting with the family context. Generally the children are adults, they don’t need to be looked after anymore and leave home. Then the maternal role decreases in importance. The relationship with the partner also changes and needs to be based on new stimuli. The couple, not being parents anymore, find themselves alone after many years and must recreate their identity.

Women who had an autonomous working life can, additionally, live the crisis of retirement, to which often is added, as we have said, a crisis due to a lack of identification with their aging body, which does not mirror anymore that image of self consolidated during adulthood; and the prevalent socio-cultural stereotypes certainly do not help to tackle these delicate changes serenely. In old age, the loss of our roles and, with them, the usual social recognition, can undermine that self-esteem that in women, in particular, is always “at risk”. Anxiety for the future, the fear of physical and mental illness reduces autonomy, the passing away of loved ones, loneliness and marginalisation, as well as the perception of the objective decrease in the possibilities of self-realisation, can worsen depression and cannot always be kept under control with the recourse to the shortcut of taking medications. Sometimes their collateral effects “collude with many of the afflictions due to old age. For example, they worsen the individual perception of a reduced capability of functioning, increasing asthenia, altering the pattern of sleep and hunger. In addition, the slowing down of the mental processes induced by many medications increases the physiological

slowing down, which makes it difficult to assess the deterioration and tolerate it” (Pratesi and Bolelli, 2009). How to tackle “the disappointment, frustration, fear that sometimes accumulate in the fourth age? This is the task elderly people have before being able to activate the resources they possess in order to think more serenely about ageing”. In this direction, the offer of psychotherapeutic treatments could then reveal itself to be, even for the female section of the elderly population, a valid support to pharmacological therapies in order to promote mental health, as it could be “a potent stimulus and exercise to think, as well as an aid to reduce suffering” (Pratesi and Bolelli, 2009).

The responsibility social and healthcare policies have to tackle the needs of this age group appears, also in this sense, fundamental. The carelessness in the diagnosis and care of cognitive and emotive disorders – we stress again that these factors are closely linked – can be considered “violence”. Unfortunately, abuse and violence on elderly women is frequent, which takes the form not only of physical acts (gerontophilia exists also as a sexual pathology), often within their own four walls (*domestic abuse*), but also, and especially, with behaviours affecting the psychological and economic sphere. It has been known for some time how not only lack of care and abandonment, but also physical and psychological violence and abuse are frequent, especially on very elderly widows (Giordano and Giordano, 1984).

Other pathological factors influence the quality of life of elderly women considerably, sometimes affecting the female population much more seriously than men of the same age. In the fourth age, chronic illnesses increase. With age, osteoarthritis and arthritis increase, affecting 18.3% of both sexes, hypertension affects 13%, allergies 10% (Report by the Ministry of Health 2009).

Following, we report, although briefly, other data on the main pathologies affecting women over sixty-five years of age. The first cause of death for women in their third age is *cardiovascular disease*, which manifests itself, compared to men, around ten years later and with a peak in the post-menopausal phase (after their 50th year every woman has a 46% chance of contracting a cardiovascular disease and a 20% chance of stroke). In fact until the menopause, women enjoy, compared to men, a biological privilege due to the endogen and cyclic production of ovarian steroid hormones, which, according to some, protect the vascular and cardiac system (Marigliano, 2009; Duzenli et al., 2009). But these data unfortunately have not been confirmed by the studies on the last years of life regarding the effect of administering the main ovarian oestrogen (estradiol) and progesterone. If men develop cardiovascular pathologies before women, once the production of ovarian hormones ceases, they develop them more quickly. Hypertension is the most significant risk factor leading to heart attacks and strokes. In fact, whilst the male organism of the “over 60s” has years of “practice” in battling high blood pressure, the female organism suddenly finds itself facing, after the menopause, a relatively new phenomenon and its impact is therefore more dangerous.

Additionally, another risk factor is the frequent weight gain and accumulation of fat. The concentration of cholesterol in the blood, especially if LDL, is an independent risk factor leading to cardiovascular diseases. In both men and women they are affected, as well as by genetic factors, also by physical exercise and diet and, in the case of women, they vary with ovarian functions. With the menopause, the lipid balance changes and LDL

cholesterol (the most harmful) increases compared to men. An LDL level above 160 mg/dl, requires an accurate medical therapy.

Mellitus diabetes is one of the most significant cardiovascular risk factors, in fact it doubles the incidence of myocardial infarction, compared to non-diabetic women, and trebles that of cardiovascular diseases. In the third age, the chance of developing diabetes increases, also because the decrease in oestrogen changes the distribution of adipose tissue. It has also been observed that many women's attempt to lose weight quickly, with a drastic reduction in their food intake, can be counterproductive, because the body loses both "fat" mass as well as "lean" mass, namely, muscles. When they then start eating again, the fat quickly re-forms, but the muscles don't; to this, we must add the fact that the ability to lose weight decreases after every drastic diet, as fasting induces our body to treasure fat. Another element that must be highlighted is the little inclination older people have, especially women, to adopt a lifestyle that includes regular physical exercise, whilst it has been stressed numerous times that it would be sufficient to walk for at least half an hour every day to improve our health condition, even when very old (Cress, 1996). For women over 50, physical exercise means, in addition, improving the muscle tone and preventing fractures and osteoporosis. Another important risk factor is, as we know, smoking. The incidence of myocardial infarction is dependent on its quantity in women over 50, increasing 2.5 times in women who smoke 1-5 cigarettes a day and 6-7 times in those who smoke more than 40. Smoking also increases the risk of stroke, arteriopathy and aortic aneurism.

An illness than concerns particularly women is, as we know, *osteoporosis*. In this case the women-men ratio is, over 65 years of age, about 6 to 1. The link between menopause and osteoporosis is known: the lack of oestrogen production in fact is an important risk factor for the onset of the illness. Oestrogens intervene in regulating the activity of osteoblastic and osteoplastic cells (demolition and reconstruction of bone trabeculae): if their control ceases, bone resorption increases and its formation decreases, bone density decreases leaving a porous and fragile structure. Hormone therapy reduces the risk of osteoporosis, but it does not stop the process and it must be administered only if there are other factors to be treated. There are in fact less risky drugs to consider. All women over 65 should have their bone density assessed. As well as the lack of oestrogens, there are also other risk factors, amongst which, again, physical inactivity, a diet lacking in calcium, the difficulty of absorbing it, being naturally thin, having had no menstruation for long periods of time, smoking, a high level of alcohol consumption, prolonged treatments with drugs containing cortisone, as well as, obviously, genetic predisposition. It is important to consider how this illness must not be seen as a physiological aspect of ageing, even though it is a very frequent pathological condition in the fourth age. A considerable number of women over the age of 60 will suffer an osteoporotic fracture and 20% of these fractures concern the proximal femur.

Amongst the osteoarticular disorders linked to the post-menopausal phase, we find, in any case, not only osteoporosis with the risk of bone fractures, but also osteoarthritis. The most recent investigations, in fact, show that muscles, cartilages and nerves also suffer damage due to the menopause. The main symptoms are widespread pain and sudden arthralgia. Osteoarthritis is a complaint that, if not treated, becomes an invalidating pathology for 25% of women over 50. Unfortunately, osteoarthritis affects (especially) women: up to 50 years of age, the ratio men to women is 1 to 1, that is, both sexes are

affected equally. After the disadvantage of having lost both the sexual hormones produced in the ovaries, as well as the precious DHEA, produced by the adrenal gland, it appears in all its strength: women are three times more likely than men to be affected in the knee, hip and hands. In about 25% of women, osteoarthritis increases incredibly quickly in the first two years after the menopause. Today we know that in this 25% of women there is an alteration in the oestrogen receptor, which seems to make them more sensitive to their lack. The fourth age of life, however, seems to be less sensitive to the lack of steroid hormones, almost as if the years bring a progressive adaptation.

Thyroid illnesses, both in the sense of hyper as well as hypo-function, affect mostly women in a ratio of over 15 to 1. Drugs containing cortisone are also taken more by women, due to the high prevalence of auto-immunitary diseases, rheumatic illnesses, etc.

We will mention anaemia only in passing, as it occurs in elderly women due to a lack of iron, vitamin B12 or folic acid (Andersen, 1996).

Finally, there are pathologies which interest exclusively women: urogynecological disorders and changes in the pelvic floor (cystourethrocele and prolapse); vulvar pathologies, and female tumours (breast, uterus, ovaries). The lack of oestrogens after the menopause substantially contributes to the development of *urinary tract* infections (UTI) in elderly women. The incidence of UTI increases vertiginously with age. Repeated infections can affect elderly women, especially if they are already debilitated or suffering from neurologic pathologies associated to urination problems. Urogynecological pathologies in this age group can be one of its major problems, because it interferes considerably with the quality of life, although today the incidence of prolapse and cystourethrocele is considerably lower. *Stress-incontinence*, nocturia and pollachiuria, leading to *urge incontinence*, need specialist surgery and medical treatment and must not be ignored when it first appears. It is therefore necessary to make healthcare institutions more sensitive towards this, so that they can offer adequate information and services.

A chapter should then be reserved to *vulvar* pathologies. As well as aesthetic and sexual issues linked to ageing, in old age there are in fact lesions which can only be identified with a biopsy.

Finally, a frequent pathology in old age, both because of its incidence and as a cause of death, is cancer. In fact, the risk of getting cancer increases with age and about 60% of tumours affect people over 65 years of age. The correlation between tumours and age is due to a prolonged exposition to carcinogens.

Female tumours (breast, uterus, ovaries) differ in their incidence according to the various organs and the histological chart. The cancer of the uterus appears mostly in old age. Breast cancer, the most frequent in women (even though it is less and less deadly thanks to early diagnoses and new therapeutic opportunities) affects, according to ACOG data (2003), 2% of 50 year-old women and 13% of 90 year-olds. Today, it is therefore recommended that women to start having mammograms at 40 years old and then repeat them every year for the rest of their lives. Ovarian cancer in elderly women is difficult to diagnose, so it is suggested that every cyst, after the menopause, is removed. Elderly women are instead affected as much as men by lung cancer (smoke related) and cancer of the colon, as well as skin tumours.

A chapter that must be tackled particularly delicately and carefully, and having access to services and treatments fully paid for by the State, is therefore

that concerning tumours in general, their early diagnosis and their surgical and medical treatment. With regards to these needs, the eradication of inequalities, both between regions and within the same region, in the access to resources for the prevention and care, is to be considered one of the aims of the National Health Service.

In addition, with the advancing of age, women face a drop in libido and dysfunctional pathologies. And whilst in this phase of life there is more need for intimate relationship to confirm their “desirability”, they have to confront a society in which the sexuality of the elderly, especially if it concerns women, is still taboo, so much so that there is no adequate information about the issues that can arise in old age with regards to having a love life and the best ways to tackle it.³⁰³ It is instead important that the emotional and sexual dimension is experienced in the same way by an elderly couple, even in a diversity of manifestations and actions compared to previous seasons in their lives. Once again, we need for the GP, as well as the gynaecologist and andrologist, to acquire the ability to *counsel* elderly patients in a way that includes also sexuality and can help to tackle with more serenity the problems that are particular to this sphere and might cause pain and anxiety.

³⁰³ Cf. N. Pratesi, D. Bolelli, *Riflessioni sul tema della psicoterapia dell'anziano*, in print.

ATTACHMENT II

Some activities and/or suggestions by local public Bodies for the most elderly in society

- The most important thing, for those living in their house alone or with a *care giver*, is access to information. This access can be promoted and guaranteed by a *call centre* that can explain and make known the initiatives and services of the local Town Hall (“social custodians” responding to these *call centres* are active in many towns) and that can link the network of services in Italy.
- Also useful has been the Samaritans service, of the type: “Hello, I’m listening...”. A free service to accompany and support, in every day life, elderly people who are alone. By dialling a free number, activated locally, the elderly contact a person ready to listen, help, give advice and also direct them towards suitable institutions when needed.
 - Vegetable gardens for the elderly. Some administrations, activating some *ad hoc* projects, assign a suitable plot of land to people willing to look after vegetable gardens and gardens in general.
 - Holiday services, especially for summer. Active especially (but not necessarily) during the summer months, they are agreements between the various private or public structures and the Towns, to offer the elderly with a low income periods in which they can leave their home for a holiday or health/wellbeing problems.
 - Social and recreational activities. A social centre for the elderly, voluntary work by the elderly in general, visiting monuments. These activities can be carried out in agreement with groups, associations, social cooperatives.
 - Activities (which some local Bodies supply in agreement with suitable structures) for wellbeing or to change the perception of wellbeing by using the so-called “complementary therapies”: massage, low impact exercise, music therapy, etc.
 - Pet Therapy. There are many research projects about the different activities or therapies provided to the elderly and achieved with the use of animals in their own homes or in assisted housing.
 - Silver card, gold card, or various other titles: they are all those economic facilitations supplied in some Towns which, with the use of an appropriate card, allow discounts on transport and food shopping or help with attending shows, accessing loans and libraries, giving the chance to attend gyms or swimming pools or other activities during their free time.
 - Care cheques, supplied to the elderly with a low income, to help them meet their healthcare expenses.
 - University for the III age, found in many Towns.
 - Bank of hours. Active in many Towns, allows an exchange of free activities.
 - Active voluntary work by the elderly, like supervising the entrance/exit to schools, pre-reception, etc.
 - In many Towns or Regions, permanent Observatories have been set up, generally about the condition of the elderly and, more specifically, on the functional, economical aspects and the quality of assistance offered to the elderly. Particularly important in this field are the Bodies that protect rights, also through pensioners’ unions, with the aim of contributing, for what concerns

- There are many projects of a preventive nature, often carried out by Clinics for the elderly, aimed primarily at the prevention of pathologies typical of that age. With regards to osteoporosis, especially in women, and the prevention of the risk of relapse, “Walking groups” are promoted to avoid falls, physical activity is aimed at exercises that improve balance, socialisation to improve temporal/spatial recognition.

- Entrusting the elderly. The service is an alternative to an admission in an Institution, by recurring to people who are not relatives of the elder patient, but are available to take care of him/her.

- There are projects that help the “carers”, promoting ways to complement the family and in particular the elderly who offer work to the carers, by supporting the social recognition of the activity of “care” to reward assistance, both for the family and for the carers.

- Suitable courses are carried out regionally to train care personnel.

- Health houses. It is a suggestion that can be found in the national health Plan, to create Units of primary Care, with a commitment to invest in them which was already in the 2007 Budget, aimed at trialling the health House, as the public place to re-organise the services and social-healthcare integration. Once the healthcare and social foundations have been established in every District-area, it is necessary to make binding and compulsory the Agreement on the plan between individual and/or associated Towns and the local healthcare Agencies for the integration of services and socio-healthcare bodies which need to work in temporal and spatial unity. In this direction also moves the national Convention of general Medicine, which foresees the creation of territorial teams of family doctors for group medicine.

- Daily centres. The centres receive the elderly that need to be housed and looked after, for a limited amount of time during the day. Their aim is to support integration and recuperation, through the carrying out of manual activities like woodwork, ceramics, drawing, using also the help and guidance of organisers, educators, therapists. These semi-residential places, with a high level of socio-healthcare integration, are destined to receive elderly who are partially self-sufficient, or non-self-sufficient, or have physical, psychological, sensorial or mixed pathologies. The daily Centre guarantees, together with home care (HCS-IHC, see below), the permanence of the elderly in their own home for as long as possible, offering also care and support for the family.

- Part of the support given to the elderly so they can stay in their home, are the Home care service (HCS) and the Integrated home care (IHC). With regards to the first, it is a service that guarantees social-care at the home of the patient in conditions of reduced or compromised autonomy, in order to allow him/her to remain in his/her usual living environment, to reduce the need to recur to residential structures, to promote the family’s responsibility and to elevate also the quality of life of the family that needs help. Home care allows the elderly patient to remain in his/her home and it can be managed also by voluntary associations or social cooperatives.

- Integrated home care (IHC) comes instead from a “structured” care system, aimed at ensuring the coordinated and permanent supply of medical care (nursing and rehabilitative medicine) and social care (personal care, delivering meals, domestic care) at the elderly’s home, by different professionals. This type of care therefore satisfies the complex needs of the

- Organiser in care homes for the elderly. The service's main objective is to improve the living conditions of people living in Rest Homes in Italy, by enhancing their capacities and abilities, even residual. The organiser's aim is to alleviate, stem and limit the loneliness and the sense of abandonment that elderly people relegated in care homes often feel.

- Also with regards to care homes – but we mention them here only in passing – we find various classifications of structures: hotel-homes, groups of flats, sheltered housing, home communities for the elderly, community hospitals.

We then have projects concerning the emergency/social sphere:

- Tele-aid. This initiative comes from the need to strengthen the care service for the elderly and to integrate, at the same time, the social structures operating in Italy, in order to satisfy in the best possible manner the needs of the assisted. The services of Tele-control and Tele-aid are active 24 hours a day and they are carried out through electronic devices (remote control, or bell, or particular telephone) linked to a care-central.

- SOS medicines and nursing support.

- Emergency Summer. Active in every Town especially in the month of August, allows monitoring the national territory, providing services and information to the elderly.

ATTACHMENT III

Some statistical data regarding women over 65 years of age in Italy

Table 1 – Italian population of 65 years olds and over, by sex and region, 01/01/2009 (v.a. and val %)

	Males			Females			Total		
	V.A.	% of the Italian national total	% of the regional total	V.A.	% of the Italian national total	% of the regional total	V.A.	% of the Italian national total	% of the regional total
Piedmont	422.110	8,3	41,9	584.295	8,3	58,1	1.006.405	8,3	100,0
Valle d'Aosta	11.065	0,2	42,0	15.276	0,2	58,0	26.341	0,2	100,0
Lombardy	800.157	15,8	41,2	1.143.265	16,3	58,8	1.943.422	16,1	100,0
Liguria	176.607	3,5	40,8	255.975	3,6	59,2	432.582	3,6	100,0
Trentino Alto Adige	77.795	1,5	41,6	109.280	1,6	58,4	187.075	1,5	100,0
Veneto	397.393	7,8	41,4	563.184	8,0	58,6	960.577	7,9	100,0
Friuli Venezia Giulia	116.488	2,3	40,8	168.899	2,4	59,2	285.387	2,4	100,0
Emilia Romagna	411.223	8,1	42,2	563.744	8,0	57,8	974.967	8,1	100,0
Toscany	362.210	7,1	42,0	500.470	7,1	58,0	862.680	7,1	100,0
Umbria	87.806	1,7	42,4	119.208	1,7	57,6	207.014	1,7	100,0
Marche	149.904	3,0	42,6	202.356	2,9	57,4	352.260	2,9	100,0
Lazio	463.867	9,1	41,9	642.530	9,2	58,1	1.106.397	9,2	100,0
Abruzzo	121.100	2,4	42,7	162.273	2,3	57,3	283.373	2,3	100,0
Basilicata	51.626	1,0	43,5	67.111	1,0	56,5	118.737	1,0	100,0
Calabria	162.798	3,2	43,5	211.618	3,0	56,5	374.416	3,1	100,0
Campania	387.092	7,6	42,0	535.616	7,6	58,0	922.708	7,6	100,0
Molise	29.636	0,6	42,3	40.494	0,6	57,7	70.130	0,6	100,0
Puglia	314.940	6,2	42,8	420.584	6,0	57,2	735.524	6,1	100,0
Sardegna	134.145	2,6	42,9	178.535	2,5	57,1	312.680	2,6	100,0
Sicily	394.156	7,8	42,7	528.327	7,5	57,3	922.483	7,6	100,0
<i>North West</i>	<i>1.409.939</i>	<i>27,8</i>	<i>41,4</i>	<i>1.998.811</i>	<i>28,5</i>	<i>58,6</i>	<i>3.408.750</i>	<i>28,2</i>	<i>100,0</i>
<i>North Est</i>	<i>1.002.899</i>	<i>19,8</i>	<i>41,6</i>	<i>1.405.107</i>	<i>20,0</i>	<i>58,4</i>	<i>2.408.006</i>	<i>19,9</i>	<i>100,0</i>
<i>Centre</i>	<i>1.063.787</i>	<i>21,0</i>	<i>42,1</i>	<i>1.464.564</i>	<i>20,9</i>	<i>57,9</i>	<i>2.528.351</i>	<i>20,9</i>	<i>100,0</i>
<i>South and Island</i>	<i>1.595.493</i>	<i>31,5</i>	<i>42,7</i>	<i>2.144.558</i>	<i>30,6</i>	<i>57,3</i>	<i>3.740.051</i>	<i>30,9</i>	<i>100,0</i>
Italy	5.072.118	100,0	42,0	7.013.040	100,0	58,0	12.085.158	100,0	100,0

Source: elaboration Censis on Istat data, "Resident population by age, sex and marital status"

Table 2 –Marital status of women who are 65 year old and over, by region, 01/01/2009 (v.a. and val. %)

	Marital status								Total	
	Unmarried		Married		Divorced		Widowed			
	V.A.	%	V.A.	%	V.A.	%	V.A.	%	V.A.	%
Piedmont	43.287	7,4	255.306	43,7	11.649	2,0	274.053	46,9	584.295	100,0
Valle d'Aosta	1.142	7,5	6.260	41,0	368	2,4	7.506	49,1	15.276	100,0
									1.143.26	
Lombardy	99.781	8,7	488.741	42,7	19.926	1,7	534.817	46,8	5	100,0
Liguria	20.386	8,0	109.379	42,7	6.770	2,6	119.440	46,7	255.975	100,0
Trentino										
Alto										
Adige	13.041	11,9	44.588	40,8	1.757	1,6	49.894	45,7	109.280	100,0
Veneto	48.320	8,6	238.594	42,4	6.991	1,2	269.279	47,8	563.184	100,0
Friuli										
Venezia										
Giulia	12.665	7,5	68.071	40,3	3.722	2,2	84.441	50,0	168.899	100,0
Emilia Romagna	38.031	6,7	249.197	44,2	10.320	1,8	266.196	47,2	563.744	100,0
Tuscany	30.611	6,1	228.345	45,6	7.963	1,6	233.551	46,7	500.470	100,0
Umbria	6.671	5,6	55.527	46,6	1.379	1,2	55.631	46,7	119.208	100,0
Marche	13.479	6,7	90.840	44,9	1.843	0,9	96.194	47,5	202.356	100,0
Lazio	57.993	9,0	288.313	44,9	15.301	2,4	280.923	43,7	642.530	100,0
Abruzzo	10.877	6,7	73.280	45,2	1.517	0,9	76.599	47,2	162.273	100,0
Basilicata	4.940	7,4	30.812	45,9	390	0,6	30.969	46,1	67.111	100,0
Calabria	18.217	8,6	93.664	44,3	1.980	0,9	97.757	46,2	211.618	100,0
Campania	50.328	9,4	234.473	43,8	5.528	1,0	245.287	45,8	535.616	100,0
Molise	2.912	7,2	18.380	45,4	286	0,7	18.916	46,7	40.494	100,0
Puglia	39.807	9,5	194.012	46,1	4.308	1,0	182.457	43,4	420.584	100,0
Sardegna	25.033	14,0	75.023	42,0	1.693	0,9	76.786	43,0	178.535	100,0
Sicily	50.961	9,6	223.905	42,4	6.462	1,2	246.999	46,8	528.327	100,0
									1.998.81	
North West	164.596	8,2	859.686	43,0	38.713	1,9	935.816	46,8	1	100,0
									1.405.10	
North Est	112.057	8,0	600.450	42,7	22.790	1,6	669.810	47,7	7	100,0
									1.464.56	
Centre	108.754	7,4	663.025	45,3	26.486	1,8	666.299	45,5	4	100,0
									2.144.55	
Sud e Island	203.075	9,5	943.549	44,0	22.164	1,0	975.770	45,5	8	100,0
Italy	588.482	8,4	3.066.710	43,7	110.153	1,6	3.247.695	46,3	7.013.040	100,0

Source: elaboration Censis on Istat data, "Resident population by age, sex and marital status"

Table 3 – Women of 65 years and over by marital status, 1996-2000-2002-2005-2007 (v.a. and val. %)

	1996		2000		2002		2005		2007		2008	
	V.A.	% (1)										
Unmarried	287.436	71,7	302.68	5	312.72	5	290.00	9	294.96	3	347.53	4
Separated/ Divorced	67.617	63,4	77.046	50,7	79.848	47,0	120.55	8	96.798	48,0	129.78	8
Widow/widow er	1.595.9	65 84,8	1.845.0	10 84,2	1.910.2	48 84,1	2.013.5	74 83,2	2.086.6	18 84,3	2.091.7	28 82,9
Total	1.951.0	19 81,6	2.224.7	41 79,7	2.302.8	21 78,9	2.424.1	41 78,6	2.478.3	80 78,7	2.569.0	50 77,4

(%) For 100 people who are 65 years old and over, alone and having the same marital status

Source: elaboration Censis on Istat data, "Aspects of daily life"

Table 4 - Health conditions and presence of some chronic illnesses in the population who has reached 65 years of age or over – Gender differences
Years 2000-2008 (for 100 people of the same age and sex)

	2000		2002		2005		2007		2008	
	Females	Males								
In good health (a)	31,1	37,7	32,4	40,7	33,6	41,0	33,3	41,2	-	-
With at least one chronic illness	83,1	77,6	83,3	76,8	84,2	75,7	84,9	76,3	84,1	78,1
With at least two chronic illness	63,4	51,8	64,0	50,4	64,4	50,1	66,7	52,3	64,5	52,6
Chronically ill in good health (b)	24,9	28,1	26,4	31,5	28,0	31,6	27,4	31,4	-	-
Diabetes	12,8	13,8	13,3	13,5	14,3	14,7	15,4	15,0	16,9	15,7
Hypertension	41,3	35,9	42,5	35,8	44,4	40,2	48,7	41,3	49,4	45,3
Chronic bronchities	16,4	24,9	17,0	22,1	16,7	21,3	17,1	21,2	14,9	19,1
Osteoarthritis, arthritis	63,1	47,3	63,9	46,0	63,2	42,4	65,5	45,1	61,1	42,3
Osteoporosis	36,7	7,5	37,2	8,5	37,7	7,3	41,1	8,2	40,0	7,9
Heart diseases	12,7	16,7	12,6	16,4	12,2	16,0	13,3	15,8	10,7	14,6
Allergies	8,4	5,9	8,6	6,2	9,6	6,1	10,9	7,6	10,2	6,9
Nervous diseases	12,8	8,2	12,3	6,8	10,9	6,9	12,9	8,3	11,9	7,9
Gastric or duodenal ulcer	7,8	10,8	6,7	9,1	7,5	8,3	7,5	8,8	5,9	8,3

(a) They express a 4 or 5 level on a scale of 1 to 5, where 1 is the worst state and 5 the best one

(b) For 100 persons affected by at least one chronic illness

(c) Including bronchial asthma

Source: elaboration Censis on Istat data, "Aspects of daily life"

Table 5 – Recourse to healthcare services in the population who has reached 65 years of age and over – Gender differences – Years 2000-2008 (for 100 people of the same age and sex)

	2000		2002		2005		2007		2008	
	Females	Males								
<i>Admissions into hospital, care institutions or NHS care homes</i>										
- Number (in thousands)	481	480	489	442	528	444	471	412	518	447
- Quota for 1,000 people	80,1	113,6	80,0	102,4	81,5	95,0	70,5	84,8	76,5	90,2
<i>People with at least one admission:</i>										
- Number (in thousands)	407	380	424	368	410	372	415	349	430	385
- Quota for 1,000 people	67,7	89,9	69,4	85,2	63,3	79,6	62,1	71,8	63,5	77,8
<i>Days of hospitalisation:</i>										
- Data in thousands	4.801	4.807	5.239	4.505	6.037	4.224	4.853	3.604	5.039	4.252
- Average for admission	10,0	10,0	10,7	10,2	11,4	9,5	10,3	8,7	9,7	9,5
- Average for admitted person	11,8	12,7	12,4	12,2	14,7	11,4	11,7	10,3	11,7	11,0
<i>Accident and Emergency:</i>										
- People (thousands)	460	379	498	408	580	479	577	487	608	504
- Quota for 1,000 people	76,6	89,7	81,5	94,5	89,5	102,4	86,3	100,2	89,8	101,7
- Recourses (thousands)	588	475	725	589	804	638	833	658	834	671
<i>Emergency doctor:</i>										
- People (thousands)	304	178	326	220	379	268	331	244	403	262
- Quota for 1,000 people	50,6	42,1	53,4	51,0	58,5	57,4	49,5	50,3	59,6	52,9
- Recourses (thousands)	482	282	632	404	643	458	536	335	627	469

Source: elaboration Censis on Istat data, "Aspects of daily life"

Table 6 - People who in the last four weeks have had preventive check-ups, by type of check up, according to a differentiation by age and sex - Year 2005 (for 100 persons with the same characteristics)

	Total of preventive check-ups (a)			Only generic prevention (b)			Specialist preventive check-ups (b)		
	Males	Females	Males and females	Males	Females	Males and females	Males	Females	Males and females
0-14	9,5	10,2	9,9	70,0	67,6	68,8	23,7	25,8	24,8
15-24	3,5	5,3	4,4	26,0	21,4	23,3	69,5	68,3	68,8
25-34	2,7	7,5	5,1	39,0	14,7	21,2	54,5	78,1	71,9
35-44	3,5	6,0	4,7	34,5	25,2	28,7	58,5	67,3	64,0
45-54	5,0	6,6	5,8	37,6	26,4	31,1	52,5	62,7	58,4
55-64	6,3	6,9	6,6	43,3	39,6	41,3	45,6	50,7	48,4
65-69	8,3	7,1	7,7	49,5	50,9	50,2	39,2	34,4	36,8
70-74	7,8	7,6	7,7	48,9	49,5	49,3	43,1	39,3	41,1
75-79	8,5	7,8	8,1	53,6	58,5	56,4	38,9	32,4	35,2
80-and over	8,7	9,6	9,3	57,7	72,7	68,0	31,5	20,4	23,9
Total	5,6	7,3	6,5	49,2	41,3	44,6	42,7	49,9	46,9

(a) for 100 people with the same characteristics

(b) for 100 people who have had preventive check ups with the same characteristics

Source: elaboration Censis on Istat data, "Health conditions and recourse to healthcare services"

Table 7 – Sport practices of the population by age – Gender differences - Year 2008 (for 100 persons of the same age and sex)

	Practice sport		Do not practice only sport or any physical activity	Practice sport		Do not practice only sport or any physical activity	Practice sport		Do not practice only sport or any physical activity			
	Consistently	Inconsistently		Consistently	Inconsistently		Consistently	Inconsistently				
	Males			Females			Males and females					
3-5	16,5	5,1	22,9	49,5	22,0	3,1	19,8	48,7	19,2	4,1	21,4	49,1
6-10	57,5	8,9	13,4	18,4	52,4	6,3	15,8	24,1	55,0	7,7	14,6	21,1
11-14	64,1	8,9	11,6	14,7	49,6	9,7	18,0	21,2	57,0	9,3	14,7	17,9
15-17	53,8	17,8	12,4	15,6	35,3	11,7	23,9	27,9	45,0	14,9	17,9	21,5
18-19	47,8	17,3	12,9	21,0	26,2	13,6	27,6	32,6	36,6	15,4	20,5	27,0
20-24	43,2	17,3	14,4	23,9	25,2	12,8	28,5	32,5	34,5	15,1	21,2	28,0
25-34	33,2	16,4	19,1	30,3	21,1	11,2	30,4	36,5	27,3	13,9	24,6	33,3
35-44	23,2	15,9	25,1	35,2	16,8	10,4	31,6	40,7	20,0	13,1	28,4	38,0
45-54	19,2	13,8	29,2	37,4	13,8	8,0	34,5	43,3	16,5	10,8	31,9	40,4
55-59	14,9	10,4	34,7	39,7	11,9	6,2	37,4	44,1	13,4	8,3	36,1	41,9
60-64	12,4	8,8	38,4	40,3	9,6	4,9	37,6	47,2	11,0	6,9	38,0	43,8
65-74	8,6	6,0	42,9	41,8	7,4	2,7	33,7	55,7	8,0	4,2	37,9	49,4
75 and over	3,5	2,2	30,4	63,5	1,6	1,8	17,5	78,6	2,3	1,9	22,4	72,9
Total	25,8	12,0	26,1	35,3	17,6	7,5	29,2	44,9	21,6	9,7	27,7	40,2

Source: elaboration Censis on Istat data, "Aspects of daily life"

Table 8 - Disable people who are 65 years of age and over, by type of disability and sex – Years 1999/2000 - 2005
(for 100 people of the same age and sex)

	1999-2000		2005	
	Males	Females	Males	Females
Disable	14,3	22,9	13,3	22,5
Type of disability				
Individual confinement	5,9	11,0	5,6	11,0
Functions disabilities	8,7	15,0	8,9	15,0
Difficulty of movement	6,7	11,5	6,4	11,6
Difficulty of sight, hearing and speech	3,8	4,7	3,1	4,6

Source: elaboration Censis on Istat data, *“Health conditions and recourse to healthcare services”*

Table 9 - **Disable people who are 65 years old and over, by type of disability, age and sex**
– Years 1999-2000 and 2005 (for 100 people of the same age and sex)

Age	1999-2000					2005				
	Disable	Type of disability				Disable	Type of disability			
		Individual confinement	Functions disabilities	Movement disabilities	Disability of sight, hearing, speech		Individual confinement	Functions disabilities	Movement disabilities	Disability of sight, hearing, speech
Males										
6-14	1,5	0,3	1,2	0,1	0,2	1,6	0,1	1,3	0,2	0,2
15-24	0,8	0,2	0,4	0,2	0,3	0,6	0,2	0,3	0,1	0,3
25-34	0,9	0,4	0,3	0,2	0,3	0,7	0,3	0,4	0,2	0,2
35-44	1,0	0,4	0,6	0,3	0,3	1,0	0,3	0,6	0,3	0,4
45-54	1,4	0,6	0,6	0,5	0,6	1,4	0,6	0,5	0,5	0,3
55-64	3,0	0,9	1,4	1,5	0,8	2,2	0,8	1,0	1,0	0,7
65-69	6,3	1,8	3,2	3,2	1,5	4,3	1,6	2,8	1,9	1,0
70-74	9,8	3,2	4,8	4,8	2,2	7,7	2,9	4,7	3,6	1,4
75-79	14,4	6,1	8,7	6,6	3,5	13,4	5,1	8,4	6,8	2,5
80 and over	38,7	19,1	27,1	17,6	11,8	35,8	16,1	25,3	17,1	9,3
TOTAL	3,4	1,3	2,0	1,5	0,9	3,3	1,3	2,1	1,5	0,8
Females										
6-14	1,6	0,4	1,0	0,2	0,2	1,6	0,1	1,4	0,1	0,2
15-24	1,0	0,5	0,5	0,2	0,2	0,6	0,2	0,3	0,1	0,2
25-34	0,9	0,4	0,3	0,2	0,3	0,6	0,2	0,3	0,1	0,2
35-44	1,0	0,5	0,4	0,3	0,3	0,9	0,3	0,4	0,2	0,3
45-54	1,6	0,7	0,5	0,6	0,4	1,3	0,5	0,6	0,6	0,3
55-64	4,3	1,7	1,6	2,3	0,6	2,7	1,0	1,3	1,6	0,5
65-69	7,5	3,0	3,8	3,8	1,1	6,5	2,4	3,1	3,8	0,8
70-74	13,2	5,4	6,4	7,3	1,8	11,4	4,7	5,6	5,9	2,5
75-79	23,0	10,1	13,8	12,1	3,6	20,8	9,6	12,1	10,9	3,8
80 and over	52,0	27,8	39,2	24,9	13,4	48,9	25,5	36,8	24,7	10,5
TOTAL	6,2	2,9	3,7	3,0	1,3	6,1	2,8	4,0	3,0	1,3
Males and females										
6-14	1,6	0,4	1,1	0,2	0,2	1,6	0,1	1,4	0,2	0,2
15-24	0,9	0,4	0,4	0,2	0,2	0,6	0,2	0,3	0,1	0,2
25-34	0,9	0,4	0,3	0,2	0,3	0,6	0,3	0,3	0,2	0,2
35-44	1,0	0,5	0,5	0,3	0,3	0,9	0,3	0,5	0,3	0,3
45-54	1,5	0,7	0,6	0,6	0,5	1,3	0,6	0,6	0,6	0,3
55-64	3,7	1,3	1,5	1,9	0,7	2,5	0,9	1,2	1,3	0,6
65-69	7,0	2,4	3,5	3,5	1,3	5,5	2,1	2,9	2,9	0,9
70-74	11,7	4,4	5,7	6,2	2,0	9,7	3,9	5,2	4,9	2,0
75-79	19,6	8,5	11,8	9,9	3,5	17,8	7,8	10,6	9,2	3,3
80 and over	47,7	25,0	35,2	22,5	12,9	44,5	22,3	32,9	22,1	10,1
TOTAL	4,9	2,1	2,9	2,2	1,1	4,8	2,1	3,0	2,3	1,1

Source: elaboration Censis on Istat data, "Health conditions and recourse to healthcare services"

Table 10 - Perceptors of work and public transfers income, by age and sex
– Years 2004-2006 (for 100 persons who are 15 years old and over with the same characteristics)

	Work		Pensions		Other public transfers		Public transfers (a)	
	Females	Males	Females	Maales	Females	Maales	Females	Males
2003								
Below 35 years of age	55,4	70,8	2,0	2,3	17,9	23,5	19,5	25,3
35 - 44 years of age	68,3	95,1	3,1	3,8	21,4	37,8	23,6	40,3
45 - 54 years of age	60,6	91,7	9,3	10,9	11,8	32,6	20,1	39,9
55 - 64 years of age	26,3	51,7	49,8	62,0	4,6	22,2	52,3	70,2
65 years of age <i>or over</i>	3,3	10,5	90,5	98,3	4,3	28,7	90,6	98,4
Total	41,4	64,5	32,1	30,9	12,4	28,5	42,6	51,0
2004								
Below 35 years of age	54,9	71,5	2,0	2,4	17,4	22,8	19,0	24,8
35 - 44 years of age	69,0	95,4	3,0	3,7	21,0	39,3	23,2	41,2
45 - 54 years of age	61,1	91,7	10,1	10,2	13,0	33,2	21,8	39,9
55 - 64 years of age	28,7	52,3	49,1	61,5	4,0	21,3	51,3	70,2
65 years of age <i>or over</i>	3,1	11,2	88,7	97,2	4,8	27,6	88,7	97,3
Total	41,7	64,9	31,9	30,8	12,3	28,4	42,3	51,0
2005								
Below 35 years of age	50,9	67,5	2,0	2,2	18,5	22,1	20,2	24,0
35 - 44 years of age	66,8	93,8	2,9	3,7	22,2	37,3	24,5	39,3
45 - 54 years of age	59,9	92,0	8,9	8,6	13,2	33,8	20,6	38,1
55 - 64 years of age	32,4	55,8	48,2	60,2	4,4	24,9	50,7	69,2
65 years of age <i>or over</i>	7,2	13,0	88,8	97,7	5,7	31,2	88,8	97,8
Total	41,4	64,2	31,8	30,7	13,2	29,2	42,8	50,3
2006								
Below 35 years of age	48,6	64,4	2,4	2,3	19,1	22,2	21,1	24,2
35 - 44 years of age	65,9	92,8	2,8	3,4	22,2	39,5	24,4	41,6
45 - 54 years of age	59,0	90,6	9,5	9,1	14,2	32,3	22,2	37,2
55 - 64 years of age	28,0	51,7	49,1	62,9	4,6	22,5	51,2	69,6
65 years of age <i>or over</i>	2,8	9,5	90,2	98,7	5,8	30,8	90,2	98,7
Total	38,7	61,5	32,6	31,5	13,5	29,0	43,8	51,1

(a) The sum of the perceptors of pension and non-pension transfers income does not coincide with the perceptors of public transfers as there are individuals who receive both these types of income.

Source: elaboration Censis on Istat data, "Income and life conditions"

Table 11 - Net individual income from work and public transfers, by age and sex
- Years 2004-2006 (average in euros)

	Work		Pensions		Other public transfers		Public transfers (a)	
	Females	Males	Females	Males	Females	Maales	Females	Males
2003								
Below 35 years of age	10.677	13.575	4.181	4.404	1.799	2.334	2.078	2.555
35 - 44 years of age	13.675	19.464	5.225	5.082	1.926	2.385	2.434	2.718
45 - 54 years of age	15.146	21.251	7.933	11.768	2.746	3.217	5.281	5.840
55 - 64 years of age	15.153	20.328	9.958	15.847	5.566	2.713	9.979	14.853
65 years of age or over	11.604	17.084	9.177	12.815	1.462	436	9.243	12.924
Total	12.952	17.866	9.137	13.243	2.142	2.181	7.492	9.250
2004								
Below 35 years of age	11.291	14.285	3.928	4.450	1.843	1.856	2.101	2.144
35 - 44 years of age	14.351	20.486	5.652	5.483	2.308	2.493	2.819	2.870
45 - 54 years of age	15.769	22.612	8.020	10.882	2.526	2.832	5.218	5.141
55 - 64 years of age	15.041	21.037	10.289	16.735	3.550	2.990	10.129	15.567
65 years of age or over	10.384	15.221	9.612	13.681	523	404	9.632	13.784
Total	13.544	18.754	9.517	13.983	2.042	2.055	7.763	9.590
2005								
Below 35 years of age	11.739	14.700	5.015	4.852	2.117	1.927	2.446	2.217
35 - 44 years of age	14.890	20.489	5.502	5.486	2.414	2.132	2.849	2.545
45 - 54 years of age	16.227	22.750	7.525	8.418	2.471	2.629	4.857	4.240
55 - 64 years of age	14.425	20.511	9.825	15.260	3.033	1.787	9.605	13.912
65 years of age or over	6.124	13.373	9.917	13.918	654	323	9.953	14.012
Total	13.671	18.854	9.637	13.642	2.142	1.753	7.821	9.332
2006								
Below 35 years of age	11.782	15.192	4.911	4.906	2.218	2.036	2.544	2.332
35 - 44 years of age	15.516	21.303	6.192	5.135	2.464	2.679	2.948	2.961
45 - 54 years of age	16.769	23.664	7.581	8.303	2.806	2.625	4.951	4.287
55 - 64 years of age	15.552	22.639	9.939	15.173	1.683	1.047	9.643	14.061
65 years of age or over	7.552	13.764	10.127	14.136	450	335	10.154	14.227
Total	14.263	19.807	9.810	13.763	2.166	1.846	7.961	9.525

(a) The sum of the perceptors of pension and non-pension transfers income does not coincide with the perceptors of public transfers as there are individuals who receive both these types of income.

Source: elaboration Censis on Istat data, "Income and life conditions"

Table 12 – Old age index by gender [composition relationship between the population who has reached 65 years of age and over compared to that between 0 and 14 years of age] (1) - Years 1992-2020 (val. %)

	Males	Females	Total
1992	80,0	121,7	100,4
1993	83,1	126,4	104,3
1994	86,2	131,1	108,1
1995	89,0	135,3	111,6
1996	92,3	140,0	115,5
1997	94,8	143,8	118,7
1998	97,0	147,2	121,5
1999	99,2	150,4	124,1
2000	101,3	153,3	126,6
2001	103,6	156,4	129,3
2002	105,0	159,2	131,4
2003	107,2	161,9	133,8
2004	109,2	164,0	135,9
2005	111,2	166,0	137,8
2006	113,3	168,1	139,9
2007	115,0	170,0	141,7
2008	116,2	170,9	142,8
2009	117,0	171,3	143,4
2010	118,5	172,6	144,8
2011	119,2	172,9	145,3
2012	121,7	175,4	147,8
2013	124,1	177,8	150,2
2014	126,7	180,5	152,9
2015	128,9	183,0	155,2
2016	131,2	185,6	157,6
2017	133,1	187,8	159,6
2018	134,9	190,0	161,7
2019	137,0	192,5	163,9
2020	139,5	195,6	166,7

(1) Data from the 1st of January of each year

Source: elaboration Censis on Istat data

Table 13 – Hope of life for those who are 65 years old (by gender) - Year 1992-2020 (average age)

	Males	Females
1992	15,4	19,2
1993	15,4	19,2
1994	15,5	19,4
1995	15,7	19,6
1996	15,8	19,6
1997	16,0	19,8
1998	15,9	19,8
1999	16,2	20,0
2000	16,5	20,4
2001	16,9	20,7
2002	16,9	20,8
2003	16,8	20,6
2004	17,4	21,4
2005	17,5	21,3
2006	17,8	21,6
2007	17,9	21,6
2008	18,0	21,6
2009	18,2	21,7
2010	18,3	22,1
2011	18,4	22,2
2012	18,5	22,3
2013	18,6	22,5
2014	18,7	22,6
2015	18,8	22,7
2016	18,9	22,8
2017	19,0	23,0
2018	19,2	23,1
2019	19,3	23,2
2020	19,4	23,3

Source: Istat data

Presidenza del Consiglio dei Ministri



**BIOETHICS AND EDUCATION
IN SCHOOLS**

16th of July 2010

PRESENTATION

The document examines the relationship between `education in bioethics and `citizenship education` of the new generations: the first is an integral part of the second, in educating the future citizen to make conscious choices in the sphere of bioethics, biolaw and biopolitics. The NBC believes that in order to take part democratically in the public debate on choices that affect the lives of all human beings, such as the choices regarding important bioethical issues, information despite its primary role, is however not the only requirement, education is also necessary. This difficult and complex education cannot be left to chance or entrusted to the messages of the old and new media. The Committee recalls the guidelines adopted by international bodies in recent years, and also draws attention to some good practices tried out in the field of education in bioethics in several countries inside and outside Europe.

The Committee focuses on examining education in bioethics at a national level. While recognizing the importance of the many initiatives carried out by universities, research centres, associations, or promoted by principals and teachers the opinion highlights the episodic and unstructured nature of such initiatives. The NBC recommends, instead, that education in bioethics should be carried out in a continuative manner by teachers who have been appropriately trained in order to ensure that young people obtain the basic preparation to actively participate in the bioethical debate, promoting the development of independent moral judgement and critical awareness regarding the major issues of bioethics, in compliance with the fundamental ethical values in a pluralistic and democratic society. The Committee recommends that this education should be conducted through pedagogical approaches and teaching tools consistent with educational objectives, starting from the documents of the National Bioethics Committee and International Organizations.

The NBC, in the document, also refers to the resumption of cooperation between the MIUR and NBC attested by the signing of the Memorandum of Understanding on July 15th 2010, which it is hoped will fully exploit the opportunities offered by the Law No.169 of 30th October 2008, with the inclusion of the teaching of *Citizenship and Constitution*.

The document derives from a working group coordinated by Prof. Marianna Gensabella, who has prepared the draft text that was discussed with Profs. Salvatore Amato, Luisella Battaglia, Lorenzo d'Avack, Maria Luisa Di Pietro, Laura Guidoni, Assunta Morresi, Demetrio Neri, Andrea Nicolussi, Laura Palazzani, Monica Toraldo di Francia, Grazia Zuffa. Within the working group Prof. Andrea Porcarelli (Scientific Director of the Portal of Bioethics and Professor of General and Social Pedagogy at the University of Pisa) and Prof. Domenico Simeone (Associate Professor of Education Sciences and Training at the University of Macerata) have been audited.

The document was approved in the plenary session by Profs. Amato, Battaglia, Bompiani, D'Agostino, Dallapiccola, d'Avack, Di Segni, Forleo, Garattini, Gensabella, Isidori, Morresi, Neri, Nicolussi, Palazzani, Piazza, Scaraffia, Toraldo, Di Francia, Umani, Ronchi, Zuffa. Only Prof. Flamigni voted against and drafted a personal remark giving reasons for his dissent. Other personal remarks have been received from Profs. Da Re, Possenti and Nicolussi. Profs. Canestrari, Forleo and Proietti and Dr. Guidoni, absent from the meeting, have expressed their support. Prof. Antonio Da Re, although not involved in the vote because absent, has expressed his abstention.

Prof. Francesco Paolo Casavola
President of the NBC

Bioethics and education in schools

1. Towards bioethical citizenship

There is an intrinsic link between bioethics and education, the same link also binds ethics and education: educating to reflection on moral values and principles. Ethics applied to life sciences and health care, bioethics comprises in this link the complexity of an interdisciplinary approach which combines the two Kantian questions regarding science and ethics. The question raised by science of “what can I know?” intersects with the ethical question of “what should I do?”, and introduces a third new question: “what ought I or oughtn’t I to do with this knowledge?” The “possibilities” of science must come to terms with the “licitness” of ethics, the boundaries being drawn by duties and rights. At the same time, in the light of scientific knowledge and new technological applications, ethics has to redefine the sphere of duties and rights, and succeed in outlining “new rights” and conversely “new duties” and “new responsibilities”.

Therefore, the relationship between bioethics and education is complicated, compared to ethics, by the passage through scientific knowledge which not only “can”, but, in its essential data, “must” be acquired and shared by *all* moral subjects, in order to find an answer to the new ethical question. An initial reflection must be dedicated to the value of science as a “public good”, bearing in mind that it is essential to the development of society. Hence, the strongly felt need in our time and especially in our country, for a quantitative and qualitative enhancement of education and scientific communication; in order to really share the “good” of science, as much as possible. A second reflection should be addressed to the intrinsic link between education/scientific communication and education/bioethical communication: from the very start of the educational *iter* the educating to a scientific mind and communication, in the best way, of the new possibilities opened up by scientific knowledge are not the only requirements. What is also required is formation of the ability of orientation as regards the choices offered by these possibilities, and communication of the bioethical questions examined by science, regardless of sensationalism and ideological pressures.

Commitment to the two strictly connected reflections on *bioethical education* and *bioethical communication* derives from the ethically public nature of bioethics, intent on watching over science as a public good. This commitment not only affects, in a relatively new way, the deontological professional training of some experts (think of doctors, all health workers, biologists, biotechnologists), but also involves in an all-embracing manner education to “active and responsible citizenship”. The education of the citizen should include a specific area dedicated to *scientific citizenship* – which focuses on awareness of the value of science as a “good”, the importance of its protection and actual promotion of this achievement – and an area dedicated to *bioethical citizenship*, understood as active and responsible participation regarding choices in the field of bioethics, starting with awareness of the new rights and duties in connection with scientific development.

In fact, the possibilities opened up by scientific and technological progress impose choices which, in a world which does not accept other political regimes apart from democracy, must be the result of free and informed debate between “all” those involved. The awareness of the new responsibilities towards human

and non-human life in the age of science and technology is also confronted with the problems of a society deeply marked by ethical pluralism. Similarly, the environmental dimension of bioethics, which also places before us certain evidence (the link between respect and care for non-human life and the protection of life and the quality of life of all human beings, as well as that of future generations), and inescapable responsibilities, is in fact, matter for interpretation, discussion and conflict as regards the manner and timing of responsible action. Several issues remain open: the link between individual and collective responsibility, the interaction of responsibilities between single states, the equitable sharing of responsibilities between developed and developing countries. Bioethics which moves in the specific context of health care is faced with the challenging comparison between the imperatives of traditional medical ethics and the expansion of the means and purposes of medicine: an expansion that has problematic reflections on the concept of life and health.

In the context of environmental bioethics as in the context of clinical bioethics, scientific data is not only a piece of data, but it is considered for the ethical problems it poses, for its being “for” or “against” man: an examination which takes place through discussion, the comparison of all those involved and which assumes that everyone has fundamental knowledge of scientific problems and basic formation in critical reflection on moral principles and values. Bioethics education is the synthesis of these two elements: a basic knowledge of the scientific problem and a basic education in ethical reflection.

2. Bioethics Education and International Organizations: statements of principle

The importance of widespread education in bioethics to all States and at all levels is reiterated in the major official documents of UNESCO. Take among others, the *Universal Declaration on the Human Genome and Human Rights* (1997)³⁰⁴; the *International Declaration on Human Genetic Data* (2003)³⁰⁵; the *Universal Declaration on Bioethics and Human Rights* (2005).

³⁰⁴ Cf. in particular: Point F. , *Promotion of the principles set out in the Declaration*, Article 20: “States should take appropriate measures to promote the principles set out in the Declaration, through education and relevant means, *inter alia* through the conduct of research and training in interdisciplinary fields and through the promotion of education in bioethics, at all levels, in particular for those responsible for science policies”; Point G, *Implementation of the Declaration*, Article 23: “States should take appropriate measures to promote, through education, training and information dissemination, respect for the above-mentioned principles and to foster their recognition and effective application. States should also encourage exchanges and networks among independent ethics Committees, as they are established, to foster full collaboration”.

³⁰⁵ Cf. Point F, *Promotion and implementation*, Article 23, *Implementation* (a): “States should take all appropriate measures, whether of a legislative, administrative or other character, to give effect to the principles set out in this Declaration, in accordance with the international law of human rights. Such measures should be supported by action in the sphere of education, training and public information”. (b): “In the framework of international cooperation, States should endeavour to enter into bilateral and multilateral agreements enabling developing countries to build up their capacity to participate in generating and sharing scientific knowledge concerning human genetic data and the related know-how”. Article 24, *Ethics education, training and information*: “In order to promote the principles set out in this Declaration, States should endeavour to foster all forms of ethics education and training at all levels as well as to encourage information and knowledge dissemination programmes about human genetic data. These measures should aim at specific audiences, in particular researchers and members of

In particular the *Universal Declaration on the Human Genome and Human Rights* affirms that, in order to implement and promote the principles established and gain a better understanding, especially among young people, of the ethical implications of scientific and technological developments, States should undertake to foster education and training in bioethics at all levels, and encourage the diffusion of information and knowledge programmes on bioethics (art. 23)³⁰⁶.

Since 2000, the International Bioethics Committee (IBC) of UNESCO has formally included among its goals to encourage in all member countries education in bioethics in an interdisciplinary perspective. The prospect identified by the Committee is that education in bioethics, apart from the specialized fields involved (doctors, researchers, health professionals, scientific, health and juridical policy makers, etc.), should be aimed at all citizens, in order to make bioethics a vital part of the general culture of tomorrow, a culture inspired by an ethic of freedom and responsibility.

In this regard, the recent ICB report on *Social Responsibility and Health*³⁰⁷ stresses the link between level of education and health in general, referring to the importance of the aforementioned Article 23 of the *Universal Declaration on Bioethics and Human Rights* in relation to Article 14 (*Social responsibility and health*)³⁰⁸ and stressing the crucial role attributed to the progress of science and technology in promoting health and social development. It highlights, among other things, that if this development is certainly related to the production, implementation and application of scientific and technological products, not less so to the possibility of increasing the awareness of researchers, policymakers and the public on the ethical implications of scientific progress and technology³⁰⁹.

But above all, the IBC, in the report of 2010, puts education among the four *Special areas of focus* together with *Health care, Research, Industry*. In this regard, see point 72³¹⁰ which calls specifically on the Governments of the

ethics Committees, or be addressed to the public at large. In this regard, States should encourage the participation of international and regional intergovernmental organizations and international, regional and national non-governmental organizations in this endeavour”.

³⁰⁶ UNESCO, *Universal Declaration on Bioethics and Human Rights*, 19 October 2005, Article 23 – *Bioethics education, training and information*: “1. In order to promote the principles set out in this Declaration and to achieve a better understanding of the ethical implications of scientific and technological developments, in particular for young people, States should endeavour to foster bioethics education and training at all levels as well as to encourage information and knowledge dissemination programmes about bioethics. 2. States should encourage the participation of international and regional intergovernmental organizations and international, regional and national non governmental organizations in this endeavour”.

³⁰⁷ UNESCO International Bioethics Committee, *Report on Social Responsibility and Health* (SHS/EST/CIB10-11/1), 2010.

³⁰⁸ The text of article 14 reads as follows: “1. The promotion of health and social development for their people is a central purpose of governments that all sectors of society share. 2. Taking into account that the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition, progress in science and technology should advance: (a) access to quality health care and essential medicines, especially for the health of women and children, because health is essential to life itself and must be considered to be a social and human good; (b) access to adequate nutrition and water; (c) improvement of living conditions and the environment; (d) elimination of the marginalization and the exclusion of persons on the basis of any grounds; (e) reduction of poverty and illiteracy.”

³⁰⁹ UNESCO International Bioethics Committee, *Report on Social Responsibility and Health* (SHS/EST/CIB10-11/1), 2010, p. 25, point 49.

³¹⁰ *Ibid*, p. 33, point 72.

Member States to provide citizens with tools for education in bioethics deemed indispensable for effective participation in public debate on the moral problems raised by scientific and technological progress, both nationally and internationally. Finally, the Report refers to the role of national ethics Committees set up also “to formulate recommendations and foster debate, education, and public awareness in bioethics”³¹¹.

In Europe the Council of Europe – founded in 1949 with responsibilities in many ways parallel to those of UNESCO, including particularly, the promotion of a homogenous cultural development of Europe – has during the years started many cultural promotion programmes, giving particular attention to bioethics, at the time of the affirmation of biotechnology applied to medicine. In 1989 during the Symposium on Bioethics of the Council of Europe which took place in Strasbourg from December 5th to 7th, there was a presentation of a survey carried out through preordered questionnaires on “teaching, research and practice of bioethics”³¹².

The survey reveals a significant difference between the structures involved in the education of bioethics in the European context (university departments, research centres, medical associations, cultural foundations interested in social issues) and even among the recipients of bioethical training (doctors, theologians, biologists, lawyers, nurses, and, in a smaller number, social workers and journalists). During the Symposium, inter alia, a working group on the teaching of bioethics³¹³ was instituted. The foreword to the debate is a definition of bioethics itself: starting with the known and classic definition provided by Warren Reich in the first edition of *Encyclopedia of Bioethics*³¹⁴, bioethics is perceived in its complexity, not as a discipline in itself, but as “a disciplinary subject”, a “rational analysis”, that is particularly complex, given the pluralistic context in which we live, and the ethical problems related to biomedicine. The levels of investigation in bioethics are identified as follows:

- a) the formulation of moral judgments on specific cases and situations;
- b) social reflection on ethically significant issues;
- c) the anthropological question regarding what generally constitutes a “good life”³¹⁵.

The identification of these levels of inquiry connects with the delineation which the Report gives of the objectives of teaching bioethics:

- theoretical: knowledge of the principles and ethical theories called into question;
- practical: education to address ethical issues;
- subjective/personal: the promotion of moral sensitivity to moral duties;

³¹¹ Ibid p. 38, point 83.

³¹² P. CATTORINI, *Teaching bioethics. A report by the Council of Europe*. in C. ROMANO – G. GRASSI (ed.), *Bioethics*, UTET, Torino 1995, p. 87. The survey, edited by S. Le Bris, is now in *Europe and Bioethics, Proceedings of the 1st Symposium of the Council of Europe on Bioethics*, Strasbourg 1990.

³¹³ The Rapporteur of the group Paolo Cattorini, Chairman Octavio Quintana (cf. P. CATTORINI, *Teaching bioethics*, cit.).

³¹⁴ W. T. REICH (ed.), *Encyclopedia of Bioethics*, The Free Press, New York 1978, Introduction, vol. I, p. XIX.

³¹⁵ P. CATTORINI, *Teaching bioethics*, cit., p. 88

- social: the promotion of social dialogue and responsibility, indispensable to democracy.

Although the enquiry and the quoted *Report* both refer to a teaching of bioethics that is not intended for middle/high school students, but for university students, identification of the different levels of bioethical investigation and the objectives of teaching can be usefully drawn on in relation to a possible inclusion of bioethics in schools. Both these features indicate the distinctiveness of bioethics, its quality as applied ethics and at the same time, its public dimension and the related necessity to decline in particular a bioethical education verging between the theoretical and practical, and between the individual and social. Another concern also emerges from the Report, strongly overlapping the issue of education in bioethics: namely, the need to deal with pluralism, a comparison made all the more difficult the younger the age of those receiving education in bioethics. It is rightly pointed out that this problem is common in teaching in the Faculty of Philosophy and, it is said, regarding schools, to the teaching of Philosophy in high schools. The recommendation is “to avoid, a paternalistic attitude, in teaching”, and promote “the personal ethical education of each student, without however the teacher having to give up their own moral choices”³¹⁶.

Also to be noted is the final recommendation, which today can still be used as an indication for those involved in education in bioethics: the intention to continue to collect, analyse and exchange experiences, *curricula*, and teaching methods between different European countries, ultimately leading to the development of guidelines³¹⁷. Lastly, the complexity involved in formulation of a project for bioethics education, the specification of its relevant and feasible educational objectives, is to be noted³¹⁸.

Continuing within the Council of Europe’s activities, it should be noted that the *Convention on Human Rights and Biomedicine*, signed in Oviedo in 1997, although it does not contain explicit references to the subject of bioethics education, already in the *Preamble* stresses the importance of promoting a public debate on bioethical issues. Chapter 10, Article 28 is dedicated to this and states: “Parties to this Convention shall see to it that the fundamental questions raised by the developments of biology and medicine are the subject of appropriate public discussion in the light, in particular, of relevant medical, social, economic, ethical and legal implications, and that their possible application is made the subject of appropriate consultation”. The importance of education in bioethics seems here an implicit premise: in order that a public debate is “appropriate” all citizens shall have the right tools to participate in it. The need to pass from the implicit to the explicit is met within the European context in some documents promoted by the relevant Committees and Commissions.

We can mention the different opinions of the EGE (European Group on Ethics in Science and New Technologies to the European Commission), which highlights the need to promote education and dialogue programmes at European level to encourage citizen participation in decisions related to developments in science and technology. To this end, in recent years, the EGE has intensified its cooperation with national ethics committees in order to allow

³¹⁶ *Ibid.* p. 90.

³¹⁷ *Ibid.*

³¹⁸ ITALIAN NATIONAL BIOETHICS COMMITTEE, *Bioethics and education in the health care system*, 7 September, 1991, p.18

in each country a debate on the various issues subjected to the attention of the Group. The intention is to give the European Commission an additional instrument with which to know the positions asserted in the various member countries in relation to certain issues. The promotion of bioethics education, in connection with the Ethics Committees of the various European countries, is specifically mentioned among the objectives and areas of action outlined by the EGE as central to the decade 2005-2015³¹⁹.

The importance of a gradual spread of bioethics in the school curriculum was also reaffirmed by the Seventh Conference of National Ethics Committees (COMETH), held in Strasbourg in December 2003³²⁰. The Conference requested the Council of Europe to promote, inter alia, the exchange of information and didactic materials between national ethics committees.

3. Education in bioethics: the international state of the art

Various initiatives in the international arena derive from the awareness of the importance of bioethics education for the new generations. UNESCO has entrusted to the relevant Committees (IBC and COMEST³²¹) the task of defining the form and content of education in bioethics.

From this a number of actions aimed at promoting the dissemination of bioethics education programmes in the member States. In particular in 2003 COMEST published the Report *The Teaching of Ethics*,³²² the first recommendation encourages universities and other higher educational institutions to provide ethics courses at three levels (elementary courses for all students, advanced courses ; courses related to a PhD in ethics).

During the 32nd General Conference of UNESCO (2003), Member States have expressed the need to establish and promote ethics teaching programs with a special reference to scientific and professional training. Following this recommendation, UNESCO inaugurated in 2004, *the Ethics Education Programme* (EEP), defined an 'Ethics infrastructure' along with the Global Ethics Observatory (GEObs) and Assisting Bioethics Committees (ABC). The program is divided into stages (collection of experts in ethics, examples of educational programs; advisory panel ethical core *curriculum*, educational resources) and its main objective being to strengthen and increase the capacity of member States in the field of 'ethical education'³²³. For the biennium 2004-2005, efforts were concentrated mainly in eastern and central Europe. In 2006-2007, priority was given to south-eastern Europe and the Gulf Region.

³¹⁹ C.f. *General Report 2000 – 2005 on the Activities of the European Group on Ethics in Science and New Technologies to the European Commission* (EGE), March 2005, p. 65.

³²⁰ Cf. http://www.coe.int/t/dg3/healthbioethic/cometh/7th_conference_en.asp : 7th Conference "New ethical challenges: Bioethics education and Biobanks", Strasbourg, France, 1-2 December 2003.

³²¹ The World Commission on the Ethics of Scientific Knowledge and Technology, created in 1998, is an advisory body composed of 18 independent experts. Its task is to deepen the ethical implications of scientific and technological development and to formulate opinions for the benefit of policy makers.

³²² The World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), SHS-2004/WS/08, Report of the working group on *The Teaching of Ethics*, Paris, 26th January 2003, Oslo, 10th-12th May 2003, p.15.

³²³ Cf. Division of Ethics of Science and Technology UNESCO, *Ethics Education Program*, 2007.

In December 2007, the International NGO Conference, held at the initiative of UNESCO Bioethics Subcommittee, in accordance with the provisions of Article 23 of the *Universal Declaration on Bioethics and Human Rights* has dismissed a report, *Éducation à la bioéthique*³²⁴, in which it emphasizes the need for bioethics education accessible to all citizens. The document outlines the “sense” with which to understand education in bioethics. First and foremost the goal is not to transmit a series of `rules`, but to teach a method for active participation in a public debate on issues of science and technology with important ethical and social implications. Hence the distinction between *the teaching of bioethics* and *education in bioethics*: the first is a stage of the second. If it is important to monitor and analyse the different experiences that have already been implemented in the teaching of bioethics (taking into consideration where they are carried out, whether and how a response is given, the underlying questions, who is the promoter and whether or not they are valid), the Report is inclined towards an education in bioethics involving multidisciplinary expertise (life sciences, social sciences and humanities, philosophy, law, semiotics, theology), which is configured as an opportunity to lay the foundations for a cross culture, capable of reaching a wide audience, with different beliefs, converging, however, to defend the dignity of ' man as an end to respect and promote. This education is designed not only as a practical study, but also as an instrument of peace.

What emerges is the “social” nature of education in bioethics, which cannot remain the patrimony only of scientists, but must involve the whole of civil society, since it calls into question the hopes, beliefs, experiences and above all everyone’s questions relating to the human being. To the extent that bioethics creates an area of open and pluralistic confrontation in civil society, an area in which different cultures, convictions and beliefs can be expressed and debated, education in bioethics is seen as an instrument to promote and enhance peaceful coexistence initiating the young to the rules of dialogue.

It is to be noted that the cited Report of 2007 connects this idea to the need to establish a definition of bioethics that highlights not only its field of application, the theoretical and practical moral issues raised by science, but also the two fundamental characteristics of interdisciplinarity and pluralism. Reference to the definition formulated in 2004 by the CIB³²⁵, is not unrelated. It is not superfluous, in fact, to recall what seems clear: behind every bioethics education there is a precise idea of bioethics: an idea which may take on, after several years from the emergence of the discipline, different and also contrasting aspects, returning to different ways of considering education in bioethics. UNESCO undertakes as one of its tasks the promotion in each country of education in bioethics in a multidisciplinary perspective, as an essential component of the general culture of tomorrow, a culture that promotes an ethic of freedom and responsibility³²⁶. The basic conviction is that the introduction of education in bioethics in schools can be an opportunity to help young people to respond to the essential questions of the contemporary world,

³²⁴ Cf. Comité de Liaison ONG-UNESCO, Commission programmatique mixte Science et éthique, *Éducation à la bioéthique*, Paris, December 2007.

³²⁵ “(la bioéthique est)...un champ d’étude systématique, pluraliste et interdisciplinaire qui aborde les questions morales, théoriques et pratiques, que posent la médecine et les sciences de la vie appliquées aux êtres humains et au rapport de l’humanité à la biosphère” (ibid. p. 8).

³²⁶ Cf. Comité de Liaison ONG-UNESCO, Commission programmatique mixte Science et éthique, *Éducation à la bioéthique*, p. 15.

promoting a new humanism. Linked to the exercise of critical thinking, the habit of listening and dialogue, education in bioethics arises in the wake of philosophy and that particular area of philosophical knowledge which is ethics, connecting to citizenship education. "The pupil must be made aware of the elements of the problem as well as the possible solutions and possible derivatives, and encouraged to reflect and to discuss"³²⁷.

All this implies, in terms of content, avoiding the risk of spreading, through the teaching of bioethics, State morals. Nevertheless, the background of values is not excluded, since the stakes are identified as a humanistic vision of sciences and technology: not only a theoretical vision but conjugated to a practice of democracy and solidarity, which focuses on the human person. For example in *Éducation à la bioéthique* some issues are listed: respect for the human body, experimentation, organ donation and transplantation; beginning and end of life, neuroscience, genetics, animal and plant biotechnology, environment and sustainable development. It is possible to identify in the 2007 UNESCO Report, a track on some fundamental questions that are still open, regarding education in bioethics:

- *when to start?*: it welcomes the decision to start education in bioethics at secondary school level, given the level of maturity already achieved by the learners, although it is stressed that the success of a programme on education in bioethics is based largely on the consistency of the education system as a whole, starting from elementary education³²⁸;

- *who should be educated?*: It stresses the need for adequate training of teachers and school heads through the acquisition of new experiences and new teaching methods;

- *how should education in bioethics be inserted into the school curricula?*: education in bioethics is conceived within the disciplines already provided, not considering it necessary to make a specific discipline;

- *what is the purpose of education in bioethics?*: not only the ethical problems raised by science, but also a view of nature and of other species that is more extensive and less anthropocentric;

- *what is already implemented in the context of education in bioethics?*: although bioethics is not listed officially as such in the school curriculum, students in secondary school for some years have approached bioethical issues through optional activities, in which the interest of the students is largely in line with the willingness of their teachers³²⁹;

- *what does "education in bioethics" mean?*: the essence of education in bioethics is the shift from "finding" to "discernment", to be precise, it does not consider the product of science as an end in itself, but confronts it with the interest of ethics. "Educating to bioethics, is thus, ultimately, to create a dialogue between the scientist who searches, finds and verifies, and the moralist who challenges, calls into question and takes a stand"³³⁰.

The last point comes back to the distinction between the *teaching of bioethics* and an *education in bioethics*: while teaching indicates the transmission of already established knowledge, education in bioethics indicates a dynamism that is open, a search set in motion by scientific fact that unites with the field of values and their transmission. The most delicate problem of

³²⁷ *Ibid* p. 17.

³²⁸ *Ibid* p. 25.

³²⁹ *Ibid* p. 21.

³³⁰ *Ibid* p. 31.

education in bioethics, the open question that we learn from reading the *Éducation à la bioéthique* is: *what are the underlying values of education in bioethics?* The text insists on the values of dignity, integrity, accountability, equality, justice, equity, solidarity and cultural diversity. Clarification of these values, however, requires a preliminary understanding of who man is. Another question emerges from education in bioethics: the question of values, or which ethic for bioethics, it refers back to the anthropological question. *Which anthropology for education in bioethics?*

Leaving the question open for the moment and moving on to the application level, the search for appropriate methods and tools for an education in bioethics, we note that the Council of Europe, on the initiative of the Division of Bioethics, following the directions of the Seventh Conference of National Ethics Committees (COMETH), cited above, has developed a real learning module (*Educational Tool on Bioethical Issues*)³³¹, in order to help start a public debate on bioethical issues among students of higher education.

The initiative of the Council of Europe is a response to one of the basic problems of education in bioethics: the need for innovative teaching tools, able to promote a participatory approach. Reviewed by professors of philosophy, biology and civics education, the *Educational Tool* is intended for young people over the age of fifteen, whatever the type and level of education, and has as its purpose: to encourage active participation in the debate, raise awareness in young people on issues of bioethics, through an open discussion that takes into account the different positions; encourage the formation of an autonomous capacity of evaluation; promote active participation in public debate on social issues, through the analysis of some specific cases, within the general framework of citizenship education; provide visibility and dissemination of the European dimension of reflection on bioethics; clarify the meaning of some key concepts of science and medicine, using examples from everyday life.

The *Educational Tool* is not just a teaching tool: the organization of the various modules, dedicated to certain issues in bioethics (organ donation, genetic testing, assisted reproductive technology, biomedical research on human beings, cloning) real guidelines can be drawn on how to understand and set up education in bioethics. First and foremost, articulation of the files (setting the theme of the scientific and bioethical problems connected to it, the historical framework of reference of the current issue, scientific data, principles of ethics, some specific cases, in-depth bibliography, glossary), aims at facilitating a clear understanding of the problem, but also to encourage open debate, stimulating questions without preconceived answers.

The ethical principles set forth from time to time, following the 1997 *Oviedo Convention*, direct to the principle that asserts the protection of the dignity and identity of human beings³³². From this principle, always invoked first in all matters, derives the obligation to give precedence to the interests and welfare of human beings over the mere interest of society or science³³³, the

³³¹ http://www.coe.int/t/dg3/healthbioethic/texts_and_documents/publications/default_en.asp

³³² Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine (Convention on Human Rights and Biomedicine), signed in Oviedo on 4 April 1997. Art.1

³³³ *Ibid* art. 2

requirement of informed consent³³⁴, as well as the ban on the sale of human body parts³³⁵, the prohibition of discrimination on grounds of genetic heritage³³⁶ and the reproductive cloning of human beings³³⁷. Just as in the *Oviedo Convention*, which is the regulatory framework throughout the *Educational Tool*, other fundamental questions are left open, especially the highly controversial status of the embryo and its protection. The openness of the question however does not mean that the problem has not been raised: on the contrary, the different ethical positions are indicated, albeit briefly, as well as the various solutions adopted by European countries in terms of regulations (for example on in vitro fertilization).

4. The experience of the last ten years: the different practices of education in bioethics in the international arena

The view of the initiatives tried out at international level is extremely varied. In particular, in Europe, yet few countries have responded promptly to the initiative of the Council of Europe aimed, as we have seen, to promote the dissemination of homogeneous didactic tools in member countries. Currently the *Educational Tool on Bioethical Issues* is adopted in Austria, France and Germany.

However, it is possible to find some common trends in various countries (European and non-European) engaged in fostering the progressive entry of education in bioethics in schools.

Firstly it must be said that the most important learning experiences are directed to the students involved in higher education (especially high schools and institutes for scientific training). In addition, it can be stated that only in few cases, including France³³⁸ and Holland³³⁹, bioethics has entered the school

³³⁴ *Ibid* art. 5.

³³⁵ *Ibid* art. 21.

³³⁶ *Ibid* art. 11.

³³⁷ Article 1 of the Additional Protocol to the Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine, on the Prohibition of Cloning Human Beings, Paris, 1998.

³³⁸ In France, the bioethics does not appear as such in the programmes of secondary education. However, for some years, pupils can address important bioethical issues in different stages of their education: at the first class level, a subject of bioethics is included in the end of year exams; in the last year (final class) in the philosophy course; in the school curriculum (projet d'établissement); in a didactic laboratory; - in the *Travaux personnels Encadrés (TPE)*, precisely research projects carried out by Groups of a minimum of 2 to a maximum of 4 students; in civic education. The INRP (Institut National de la Recherche Pédagogique) provides materials for self-training of teachers on various topics including "life sciences" that include a dossier on assisted reproduction and cloning ([http://www.inrp.fr / Acces / biotic / procreative / accueil.htm](http://www.inrp.fr/Acces/biotic/procreative/accueil.htm)). Moreover, as noted above, France has adopted the Council of Europe *Educational Tool* for the teaching of bioethics in high schools. Three of the five themes contained in the European learning module (medically assisted procreation, organ donation, genetic tests) are published on the website of the General Assembly of bioethics (<http://www.etatsgenerauxdelabioethique.fr>). For the first time the new programmes for the College announced in August 2009 by the Minister of National Education, Luc Chatel, officially include the issues of sustainable development, bioethics and globalization (<http://www.education.gouv.fr/cid48749/rentree-scolaire-2009.html>). The discipline within which the new modules will be included is called "Life Sciences and Earth Sciences" (See *Programmes de l'enseignement de sciences de la vie et de la Terre*, "Bulletin officiel" spécial n ° 6 du 28 août 2008). To be treated within that discipline for the years 2008/2009 and 2009/2010 the foreseen topics to choose from are medically assisted procreation, man's place

system in a fairly structured way thanks to close cooperation between national ethics committees and the corresponding Ministries of Education. Also in these cases, however, education in bioethics is not a separate discipline, but it takes its place alongside existing disciplines (both humanistic and scientific), complementing the programme.

The most prevalent approach, however, remains the one that focuses on the provision of virtual learning spaces as a privileged means for the dissemination of education in bioethics programmes: web portals with a high degree of interactivity, usually designed for teachers, but also accessible directly to students, where all kinds of educational material, constantly updated, can be viewed and downloaded. These sites always offer, along with content resource, also help and a methodological guide for the setting up of the lesson.

As an example we can cite the experience of the Kennedy Institute of Ethics at Georgetown University (Washington DC) where the High School Bioethics Curriculum Project integrates the teaching of traditional models based on training workshops for teachers, and the most modern computer tools³⁴⁰. The stated purpose of the Project is "to show children that there are different and often conflicting points of view and that sometimes people have the right to disagree. The sooner students learn that there are problems for which there is no single solution, the sooner they will be ready to become responsible citizens"³⁴¹.

Worthy of quote is the experience sponsored by the National Ethics Committee of the Nordic countries (Denmark, Sweden, Norway, Finland, Iceland) engaged since 2001 in a systematic way on the subject of the teaching

in evolution, from genotype to phenotype; biotechnological applications (<http://eduscol.education.fr/cid45770/programmes-en-vigueur.html>).

³³⁹ Bioethics in Holland is among the objectives of a teaching curriculum mandatory for all. In secondary education (high schools, professional schools, etc..) the course "maatschappijleer" is provided (<http://www.maatschappijleer.nl/>), which can be translated as "social sciences" for all pupils. The course takes place during the 2nd and 3rd year of high school or professional-technical school for 2 hours per week. In terms of teaching, general guidelines have been established for the programmes of "social sciences" that are valid for any type of secondary school. Within this framework, the teacher is relatively free to propose topics for discussion and methods in agreement with the students. The course program can be adapted according to the needs and characteristics of the individual school. An element always present is the treatment of ethical issues.

³⁴⁰ <http://bioethics.georgetown.edu/>. In the USA education in bioethics has been present at the higher levels of education since the 1990's: school, university. The High School Bioethics Curriculum Project is a program for the teaching of bioethics in secondary schools with particular reference to science courses. Among the topics covered are the quality of life, human dignity, cultural differences, the cost of care, procreation, organ transplantation, human experimentation, eugenics. The programme requires that teachers regularly meet in 'workshops' where they are given the material for use in class and provided with guidance on detailed texts, films and audiovisual material in general. The Kennedy Institute of Ethics has also produced a handbook of bioethics, and also publishes the work of the workshops and ensures its updating. In some high schools bioethics courses separate from the standard program have begun. In this case, ad hoc websites with educational materials and discussion forums have been created. In addition interested teachers have at their disposal a National Reference Center for publications, materials and all kinds of information. The method adopted is based on the presentation of special cases. Then there is the proposal of a set of useful questions pertinent to the argument that teachers can use in class. The workshops are for teachers of various disciplines: biology, philosophy, religion, health, mathematics, chemistry, law, social sciences, American history and civic education, history and ethics. Participants in these programs are followed throughout the school year and Internet databases are constantly updated and available.

³⁴¹ Cf. High School Bioethics Curriculum Project (<http://bioethics.georgetown.edu/>).

of bioethics. On 27 May 2008, the Committee (NCBI) organized a *workshop* in Oslo on *Teaching Material in Bioethics*. The objective was to select good quality teaching tools already available in one or more Scandinavian languages: tools which were successively translated into all Nordic languages. In 2008 a Working Group was also established that published a *Report*³⁴² which proposes the construction of an interactive website totally dedicated to teaching materials for the teaching of bioethics available in all languages of the Nordic countries. The intent is to assert a broad conception of Bioethics encompassing not only the moral problems that arise from the development of biotechnology, but also the traditional issues of medical ethics. The target audience is teachers, students and, more generally, the public. The Working Group does, however, envisage the typical user of the site as the teacher. Students could use the website themselves, but it is preferable that they are guided by the teacher towards certain didactic materials. The *Report* states that the teaching of bioethics is important because the ethical discussions are an important element for the training of young citizens in democratic societies. It also stresses that the non-inclusion of bioethics in the school *curricula* would be to assume that the younger generation should learn to argue and express an opinion on the ethical problems elsewhere, that presumption is defined as a major risk.

As a final example of good practice it is possible to quote the BEEP Programme (BioEthics Education Project)³⁴³ which has already been active for some years in the United Kingdom. The heart of the Project is an interactive website, designed as a virtual learning space for teachers of high schools and scientific institutions and their students. It is a learning resource developed to explore the moral, ethical, social, economic and environmental implications of technology and the applications of biology.

BEEP has the aim to provide students with updated and balanced information to develop their capacity for argumentation in debates and discussions on ethical issues raised by science to help them develop an independent ability to judge and to make personal ethical evaluations. At the same time, promoters³⁴⁴ aim to increase the skills of teachers of scientific disciplines as regards complex and controversial ethical issues.

The site contains useful downloadable teaching materials for teachers to set up a lesson on various important bioethical issues (genetics, human reproduction, biotechnology, health, environmental ethics, animal ethics, etc.). Students and teachers can also participate in *forums* and *online* discussions. In addition, there is a glossary in which each entry shows the main ethical questions related to it, using presentation of specific cases.

From this brief analysis of already operational experiences there is clear confirmation of some theoretical trends that have emerged in the documents of international organizations, such as: the link between education in bioethics and citizenship education; the need to link education in bioethics to the ability of critical judgement, argumentation, and active participation in discussion in a pluralistic ethical context. There are some clear indications on teaching methodology, which had already emerged, especially in the *Education Tool*,

³⁴² A *Nordic Initiative in Bioethical Educational Resources*, Report from a working group on educational resources in bioethics". Lysebu, Oslo, 2008 11 04.

³⁴³ <http://www.beep.ac.uk/content/130.0.html>.

³⁴⁴ The official sponsors include the University of Bristol and the Society of Biology. Cf. <http://www.societyofbiology.org/home>.

namely, the need to find innovative methods and tools, able to stimulate interest and promote a participatory approach. This research leads in many countries to the transmission online of didactic materials and the promoting of participation in the bioethical debate in the form of participation in *forums* and *online* discussions.

5. Bioethics and education in Italy: the Opinion of the Italian National Bioethics Committee in 1991

In our country the National Bioethics Committee dedicates in the early years an Opinion to the relationship between bioethics and education, limiting it to the context of health professions: *Bioethics and education in the health care system* (1991). Already in this opinion, the NBC notes that “in the context of the culture of health education, appropriate decisions should be taken for early bioethics training, as early as during the school years which precede the preparation for health professions”³⁴⁵.

Focusing on “health care”, by framing it however within the broader context of caring for the environment, the NBC highlights the public dimension of the issue, stressing that the essential task of a democratic society is the bioethical education of *each* citizen: “The issue of health training is (...) very broad, extending to other areas, politics, justice, administration, work, all the agencies of socialization, school to a great extent. It should be of interest to all schools, universities, etc., which prepare in various ways for professions involved with the protection of health, not only purely medical. It should also be stated that a culture of health education in the broader context of ecological culture, is required for the entire population: as such it is a social obligation, and should be initiated early, before the age of career choices”³⁴⁶.

Awareness of the importance of a commitment by the whole of civil society, and especially by the Committee itself, to bioethical education of the new generations clearly emerges already in the 1991 opinion: an education which is an essential step in the preparation of the future citizen for bioethical choices³⁴⁷.

Despite focusing in a specific area, the 1991 opinion is a significant starting point for thinking about bioethics education in a broad sense, as it already contains “the cornerstones” highlighting the strong correlation between “the ability to know”, “the ability to do”, and “the ability to be”: the role of disciplines defined as *humanities*, due also to the choices which pertain to the area of life sciences and health care; the importance of bioethics education during school years for preparation of the citizen for public debate; the predisposition towards a national education project that makes use of the competency of the NBC³⁴⁸.

Among these elements what appears particularly significant from the theoretical point of view is the triple nexus between “the ability to know”, “the

³⁴⁵ ITALIAN NATIONAL BIOETHICS COMMITTEE, *Bioethics and education in the healthcare system*, p. 8.

³⁴⁶ *Ibid* p. 9

³⁴⁷ “It is hoped(...) for the contribution that bioethics can make to the preparation of the citizen to public debate on these issues, that it finds space in an appropriate form also at upper high school level” (*ibid* p.24).

³⁴⁸ L. BORGIA, *Bioethics in schools*, in the ITALIAN NATIONAL BIOETHICS COMMITTEE, *The National Bioethics Committee 1990-2005. Fifteen years of commitment*, Rome 2005, p. 109.

ability to do”, and “the ability to be” which can be applied beyond the scope of the health professions within the broader problem of an education in bioethics.

6. Initiatives to promote education in bioethics in Italy: the 1999 and 2010 MIUR-NBC Memoranda of Understanding

The need for a proper formation in bioethics as an essential part of educating the new generations to active and responsible citizenship gave rise in 1999 in Italy to a *Memorandum of Understanding between the Ministry of Education and the National Bioethics Committee*.³⁴⁹ In the *Memorandum* in the protocol the two parties undertake to "develop joint initiatives for schools aimed at knowledge of the problems arising from the progress of science in relation to human life and other species and the use of biotechnology, and the acquisition of knowledge of the legal implications related to this social and moral progress." "Knowledge" and "awareness": these two keywords mark a commitment to education in bioethics, which because of its significance; can only take place in schools. There was and still is the need to offer young people something more and something better than the current *communication of bioethics* by the *mass media*.

In the *Memorandum of Understanding* the areas of intervention in which to implement a proper bioethics education are identified and in particular: didactic research on how to approach bioethical issues, introduction of bioethical issues in the relevant disciplines, the training of school staff of and at all levels, production of materials for distance education of teachers, and development of teaching materials for use in class.

In view of the commitments made by both parties, unfortunately the *Memorandum of Understanding* has not given rise to the proposed initiatives. Among the hypotheses put forward to describe the reason for the lack of implementation of such initiatives, is the theory that sustains the difficulty to design “one” bioethics education in response to the presence of strong tensions between the different paradigms in bioethics, inspired by different ethical and anthropological perspectives. The project of bioethics education in schools seems to have stalled not for the *lack* of motivation – the inability to reply to the question as to “why” to educate in bioethics - but because of the difficulty to converge on “how” to educate and especially “which” bioethics should constitute the educational model³⁵⁰.

Alongside this hypothesis of comparison-clash between different bioethics, another hypothesis explains the block in the implementation of the *Memorandum* with the historical contingency, that is, the period which the Italian school system is going through, described as a major time of reform to the system, still unfinished³⁵¹.

³⁴⁹ See Appendix 1

³⁵⁰ Cf. D. NERI, *L'etica e la filosofia nei processi formativi della nuova scuola secondaria* e G. DEIANA, *La cultura etica. Ipotesi progettuali ed esperienze realizzate*, in *Bioetica ed etica pubblica. Una proposta per l'insegnamento*, (ed) Giuseppe Deiana and Emilio D'Orazio, Edizioni Unicopli, Milan 2001.

³⁵¹ The year of the signing of the *Memorandum*, 1999, is also the year of enactment of the Presidential Decree 275, comprising the regulation on school autonomy, as well as being the date of commencement of the work of the Ministerial Committee for the Reorganization of school cycles.

In fact, the two theses do not exclude each other: the difficulty of finding an agreement on “which bioethics” to teach is evident, as is clear that the project for collaboration between MIUR and NBC for bioethics education on schools comes at a time of protracted transformation of the Italian school system. All this has generated difficulty in carrying forward a well-defined project, as the reference context is indefinite and ever changing.

Today, not long after implementation of the Gelmini school reform, the situation seems to have been unblocked. In July 2010 there was the signing of a new *Memorandum of Understanding* between MIUR and NBC³⁵², with which the two parties “undertake to pursue joint initiatives in order to make education in bioethics an integral part of school education, so as to ensure that new generations have an equal opportunity to participate in public debate on ethical, social and juridical problems posed by scientific and technological progress” (art..1).

Some years after the first *Memorandum*, it can be noted how the same intention assumes different shades, such as the reference in line with the development of bioethics, to participation in public debate. Even as regards areas of intervention, it is possible to notice a common ground and some differences. The areas indicated in 1999 have all been taken up again with greater and more specific articulation. To be noted: as regards the most appropriate teaching methods, the intent to start from theoretical investigation and from examples of “best practices”; for inclusion in the various *curricula*, the indication of a non-exclusive relationship with the teaching of “Citizenship and Constitution³⁵³”; on teacher training, the reference to programmes of “formation and refresher training” to be held at universities or MIUR accredited institutions; as regards the didactic material, the provision of *online* material, websites and *web forums*. However, two differences are most evident: insertion, at the first point of an intervention not provided for, in the first *Memorandum*, namely a survey through questionnaires directed at school principals and teachers at the secondary school level, “the current status of teaching on bioethical issues in schools”, the intent of teaching aids, both for teachers and for learners to “take account “of the documents of the NBC.

The *Memorandum* of 2010 contains years of experience, the need to update due to the era, and also to the hope that the inclusion of education in bioethics in schools can overcome the difficulties and fragmented forms so far adopted, and join in the footsteps of the school Reform.

7. The difficult penetration of education in bioethics in our school system: amid social education and other educations

In the dynamic context of the Italian school system in recent years, characterized by tension towards the new, but also by uncertainty, the instance of a *social education* which has taken the form of a variety of “educations”: health, environment, law, human rights, affection etc. The different instances of social education find accomplishment in citizenship education that is promoted today by the provided inclusion of education in *Citizenship and Constitution*.

Education in bioethics appears to be, in some way, inherent in different forms of social education, starting from the first, in chronological order, health

³⁵² See Appendix 2.

³⁵³ For the teaching of Citizenship and the Constitution see next paragraph 7

education³⁵⁴. The 1979 new middle school programs reserve a specific space to *health education*, the contents of which are integrated within the teaching of natural sciences, however it did not provide a specific quantity of "total hours". Hence the renaming of natural and physical mathematical sciences in "education in maths, science and health", despite the clarification of the need to weave a close relationship - as regards health education – with the teachers of all the other disciplines. In the 80's health education begins to appear as such (with this name) in the juridical sources, which in turn make it an unavoidable condition to counter situations of distress and school abandonment. In the CM 78/83 we read for example that health education "should permeate all educational work in school in awareness of the close relationship between physical, mental and social health and the processes of learning." Health education also includes all the activities of "information on the damage caused by alcohol, smoking, use of narcotic or psychotropic substances, as well as from the related diseases"³⁵⁵. Especially in the 90's many of the teacher training initiatives (and also some interventions aimed at the children) have found a place in the context of bioethics - from a regulatory standpoint - in the context of health education.

It is clear that there are also many links between bioethics and other "educations", such as human rights education, with particular reference to reflection on the "new rights", or environmental education. As regards the latter a significant step forward is represented by the *Charter of Intent* between the Ministry of Education, University and Research and the Ministry for the Environment, and the Protection of Land and Sea, on the subject of "School, Environment and Law", signed July 29, 2009. This Charter, taking "environmental education within the teaching of *Citizenship and Constitution*," commits the two Ministries, in accordance with specific skills, to incorporate in the educational proposal "the themes of environmental education and sustainability" and to "implement in kindergarten, primary school, and state and private first grade secondary school, teaching practices on issues of sustainable development and environmental education".

The word "bioethics" is however absent in the Charter, so that education in protection of the environment constitutes almost an "unrelated" subject to bioethics and can be carried forward "without" an education in examination of connected ethical issues and reflection, according to the different degrees of maturity of the pupils, on related ethical principles. It is however clear that protection of the environment comes about through the responsible use of scientific and technological progress; this is one of the priority objectives of bioethics, from its beginning. One needs only to recall the first model of bioethics outlined by Van Potter in 1971 in *Bioethics: Bridge to the future*³⁵⁶ and

³⁵⁴ "The cause of the sporadic presence of health education in schools, in explicit terms, is given by the spread – among young people- of the use of drugs, so that the first law regulating the use of drugs, Law no. 685/75, contained some articles specifically devoted to the work of schools, seen especially in terms of health education and information on the damage resulting from use of these substances " A. PORCARELLI, *L'insegnamento della bioetica nel quadro dell'educazione alla convivenza civile: genesi e prospettive*, in Id. *Bioetica e convivenza civile i risultati di una ricerca*, IRRE – Emilia Romagna, Bologna 2004, p. 38).

³⁵⁵ DPR 309/90, art. 326.

³⁵⁶ V.R.POTTER, *Bioethics.Bridge to the Future* (1971), tr.it. R. RICCIARDI: *Bioetica: Ponte verso il futuro*, Introduzioni M.GENSABELLA FURNARI e G. RUSSO, Sicania, Messina 2000.

the thesis developed by Hans Jonas in the text *The Responsibility Principle*, in 1979³⁵⁷.

Contrary to what appears in the mass media debate, in which bioethics is reductively identified with the great issues of clinical bioethics (from in vitro fertilization to euthanasia, from genetic engineering to the use of stem cells, and the living will), bioethics is, according to the aforementioned definition of Warren Reich in the first edition of *Encyclopedia of Bioethics* (1978), the "systematic study of human conduct" not only in the field of science in health care, but also in the broader context of "life sciences". Defined in an even wider sense in the 1995 edition, as "the systematic study of the moral dimensions - including moral vision, decisions, conduct, and policies - life and health sciences, through a variety of ethical methodologies in an interdisciplinary way"³⁵⁸ bioethics comprises the important and significant dimension environmental bioethics and animal bioethics: two distinct yet closely related dimensions, often identified with bioethics *tout court*, that is, the dimension of clinical bioethics addressed to ethical issues connected with human health care.

The close connection between health and environmental protection is, among other things, forcefully reiterated in the UNESCO Declaration on *Bioethics and Human Rights* (2005). The inclusion of environmental education may therefore be a first step the hoped for inclusion of continuous education in bioethics in schools. The NBC had, in fact, already recommended, in the Opinion on *Bioethics and Environment* 1995, the introduction in schools of "an environmental education programme" in order "to entrench in the new generations ecological values as part of professional education, to safeguard the common good and the rights of individuals"³⁵⁹.

To pass to citizenship education we can see that its roots date back to the entrance of *civic education* in schools, intending it to be a projection "towards social, juridical and political life, namely towards the principles that govern the community and its existing forms".³⁶⁰ A subsequent attempt to revive this request is the Ministerial Decree 58/1996 which foreshadowed a more robust framework for the subject that was named *Civic education and Constitutional culture*. It was an interesting hypothesis, the potential effectiveness of which was not assessed, as it never entered into force.

There was a significant conceptual evolution in the problem of the relationship between school and life with the Law No.53/2003 and its implementing Decrees, which starts out from the thesis that all teachings should be geared to ensuring that "disciplinary and interdisciplinary knowledge (*knowledge*) and operational skills (*doing*) learned and practiced in the formal system (school), non-formal system (other educational institutions) and informal system (social life as a whole) have become personal skills of each individual"³⁶¹. This is the goal of the *Educational cultural and professional profile of the student* (PECUP), expected at the end of each cycle of the educational system of Education and Training. In this context one should also consider the attempt

³⁵⁷ H. JONAS, *Il principio responsabilità*, tr.it. P.P. PORTINARO, Einaudi, Torino 1993.

³⁵⁸ W.T. REICH, (ed.), *Encyclopedia of Bioethics*, Macmillan Library Reference USA, New York 1995, 2° ed. vol. I, *Introduction*, p. XXI.

³⁵⁹ ITALIAN NATIONAL BIOETHICS COMMITTEE, *Bioethics and environment* Opinion approved in the plenary session on 22nd September 1995, p. 9 (<http://www.governo.it/bioetica/pdf/19.pdf>).

³⁶⁰ DPR 585 13th June 1958.

³⁶¹ D. L.vo 59/2004, all. D; *Educational , cultural and professional profile of the student*.

to make sense of all the various educational requests, now numerous, making them converge in *Civil Society Education*. Even in this case the general regulations arise from very solid pedagogical requests focusing on cross-disciplinary thematic content of the six "educations" (citizenship, road, environmental, health, food and affection) that find their point of connection in educational intentionality made explicit by the reference to the above *Profile*. *Civil Society Education* has stimulated interesting forms of projects, often linking with some specific requests (such as those relating to road education³⁶²) on which initiatives have been built³⁶³ between schools and organizations working in the area.

In the XV legislature (2006-2008) a review of *National Guidelines* began, with the enactment of the *Guidelines for the Curriculum*³⁶⁴, which on the one hand contained many aspirations as regards the social and civic education of young people, sometimes driven by extemporaneous suggestions from media discussion, but on the other hand it eliminated civil society education, and above all, it eliminated the PECUP, with some parts being in fact "dissolved" in a plurality of "goals for the development of skills", all expressed in terms of disciplines.

With the start of the current legislature, a decree later converted into law³⁶⁵ has introduced a new discipline called *Citizenship and Constitution*, with its own time slot and self-evaluation. With the Policy Document issued by the MIUR on 4 March 2009 learning goals and task situations for the certification of skills related to *Citizenship and Constitution* were given, this teaching began on an experimental basis during the school year 2009 / 2010.

The Decrees³⁶⁶ which have accomplished the reorganization of the first and second cycle, in fact, do not envisage the discipline with a time and self-evaluation, but specific reference is made, stating that within the framework of teaching of the most relevant disciplines (history, law etc.) the knowledge and skills related to *Citizenship and Constitution*³⁶⁷ must be acquired.

These uncertainties also fall on the possible inclusion of bioethics in schools, given the possibility of a link between education in bioethics and the teaching of *Citizenship and Constitution*. Bioethics - often dealing with new issues in law - calls into question the "constitutional" sensibility of citizens and those who are about to become citizens, and can therefore be *a laboratory space for citizenship education and in-depth study of the principles of the Constitution* (which are the fundamental objectives of *Citizenship and Constitution*). Furthermore, this connection is clearly in line with the thesis present in international documents, particularly European ones, on the meaning of "social" and more specifically "civic" in education in bioethics.

³⁶² Cf. A. PORCARELLI (ed), *Cittadini sulla strada. L'educazione alla sicurezza stradale come componente della convivenza civile*, Armando, Rome 2007; ID., *Lineamenti di pedagogia sociale*, Armando, Rome 2009.

³⁶³ For a broad survey profile see the Portal created by the USP of Bologna: www.cittadinisullastrada.org.

³⁶⁴ DM 31/7/2007.

³⁶⁵ DM 137, September 1, 2008, converted into law, with a vote of confidence, 29 October 2008

³⁶⁶ The Presidential Decree 89, March 20, 2009 for the first cycle and DPR 87, 88 and 89 of 15 March 2010 containing regulations for the (respective) reorganization of the technical colleges, vocational institutes and high schools.

³⁶⁷ To investigate the potential offered by new teaching cf. L. Corradini (ed.) *Cittadinanza e Costituzione. Disciplinary e trasversalità alla prova della sperimentazione nazionale. Una guida teorico-pratica per docenti*, Tecnodid, Napoli 2009.

The resumption of cooperation between the NBC and MIUR sanctioned by the new *Memorandum of Understanding* of 2010, promotes bioethics education, as said, "even in relation to Citizenship and Constitution"³⁶⁸(...). It is therefore possible to consider "even" education in bioethics, among the "awareness-raising actions and staff training aimed at acquiring in the first and second cycle of education knowledge and skills related to *Citizenship and Constitution*, in the context of the historical-geographical areas and the socio-historical areas and the total number of hours scheduled"(Article 1.*Citizenship and Constitution*).

After being tangential or transverse to the various educations, education in bioethics would in this way find its place within the teaching of *Citizenship and Constitution*: practically carving out a specific space in education in *bioethical citizenship* within the broader space of citizenship education. Some apparent specificity of *bioethical citizenship* should however not be forgotten and which have a significant impact on the teaching in question. The inclusion of bioethics education within the skills and knowledge relating to "Citizenship and Constitution, raises the problem of discipline reference areas: indeed the historical-geographical areas and socio-historical areas are appropriate, in fact, the importance of the contribution of history must be emphasized to understand issues such as the birth of bio-politics and the anthropological and social impact of scientific and technical discoveries. Such areas, as the humanities in general, are necessary, but at the same time, insufficient for understanding bioethical issues, there is a clear need to also involve areas of science and technology. Bioethics training needs, because of the particularity of the subject, to follow a course of action characterized by an intertwining of disciplines, distant in terms of methodology and *forma mentis*, consequently appropriate and innovative teaching methods are required.

Lastly, an alternative would be that education in bioethics should find its own space, a space not inside but on the *fringes* of *Citizenship and Constitution*.

8. Spontaneous practices of education in bioethics in Italy

In our country, faced with the complexity of the *iter* of the process of transformation of the school system, education in bioethics albeit still at the cross-disciplinary level or at mere project level, the truth of the matter is that the penetration of bioethics in schools has "in fact" occurred, particularly during the last ten years.

Although the 1999 MIUR-NBC Memorandum of Understanding in recent years has not been implemented, despite the criticism of many, the need for bioethics education has been so present and alive within the school world so as to pursue a series of initiatives that, despite their not being of a systematic and continuous nature due to not having benefitted from the synergy ensured by the MIUR and NBC together, nevertheless these initiatives have, over time, grown in quantity and quality. The National Bioethics Committee itself has promoted the National Conference of Bioethics for Schools, held continuously

³⁶⁸ See the appendix of *Memorandum of Understanding* 2010, Art. 2 point C.

since 2001 by the Italian Institute of Bioethics, in collaboration with several universities and think tanks, and now in its eighth edition³⁶⁹.

Other initiatives, carried out by universities, centers of research and study groups associations or institutions, or promoted from within school by principals and teachers in recent years, have formed what might be called spontaneous practices of education in bioethics. Places for documentation and discussion for teachers have arisen, linked both to universities, and non-university centers of bioethics, with a clear commitment to the field of education³⁷⁰, as well as various *Laboratories for the teaching of bioethics*.³⁷¹ A specific space has been set aside to the theme of bioethics education in schools by some issues of "Bioethics and Culture" and "Medicine and Morals," by the journal "Bioethics and Society," and by "Bioethics. Interdisciplinary journal, which has a section dedicated to bioethics education and on the web in the *Bioethics Portal*, that deals with the section "Bioethics and School".

The experience, gained in a spontaneous way since the 90's, in the sphere of scholastic bioethics education have involved a lot of young people, arousing interest and enthusiasm and sowing the seeds of "bioethical skills". It would be of great interest to conduct an enquiry to detect and analyze the experiences of education in bioethics in Italian schools in recent years. Unfortunately, the episodic, occasional, and certainly unstructured nature of this education makes it a particularly difficult undertaking. The survey based on questionnaires only in the Emilia Romagna region in this respect can be a

³⁶⁹ The promotion of the National Bioethics Committee arises from the conviction that the Conference achieves one of the NBC's institutional responsibilities, that is, promotion of correct public information on bioethical issues: a particularly important task when applied to the moment public opinion is being formed, namely, the younger generations.

For students of secondary schools, the conferences have so far involved a large number of schools from different regions of Italy. According to a tried and tested method of working, the experts' reports are intertwined with the preordered intervention of the students, who have been prepared in advance by their teachers on the theme of the conference, they intervene with individual and/or group presentations in student forums, so becoming real co-protagonists, or co-authors of the cultural event. Below is a list of the past National Bioethics Conferences for Schools: 1. *Bioethics and Human Rights* – 1st National Bioethics Conference for Schools-Capua, Caserta, 2001. (Publication of acts: M.A. LA TORRE (ed), *Bioetica & diritti umani*, Foreword by G. Berlinguer, Luciano Editore, Napoli 2004); 2. *The metamorphosis of health* – 2nd National Bioethics Conference for Schools - University of Genoa, 2002; 3. *The challenges of genetic engineering*. 3rd National Bioethics Conference for Schools-University of Messina, 2003; (Publication of acts: M. GENSABELLA FURNARI (ed), *Le sfide della genetica. Conoscere, prevenire, curare, modificare*, Rubbettino, Soveria Mannelli 2005); 4. *The European Convention on Human Rights and Biomedicine*. 1st International Conference – 4th National Bioethics Conference for Schools, University of Genova 2004; 5. *The Body between biology biography and the market* - 5th National Bioethics Conference for Schools . Centre for Bioethics in Pontedera (PI), 2006; 6. *Inhabit the earth. The responsibility of living between nature and culture* – 6th National Bioethics Conference for Schools, Centre of Bioethics in Pontedera, Volterra (PI), 2007; 7. *Health as a good. Thirty years after the establishment of the National Health Service*, 7th National Bioethics Conference for Schools, University of Messina, 2-3 April 2009; 8. *Possibilities and limits of genetic inquiry*, 8th National Bioethics Conference for Schools, Piaggio Museum, Pontedera 29 april 2010 (<http://www.governo.it/bioetica/scuola.html>).

³⁷⁰ We cite, among others: the Centre of Bioethics of Pontedera (www.centrobioeticapontedera.it); the Centre of Cultural Initiatives of Bologna (www.bioeticaepersona.it); the Laboratory of Bioethics of Messina (<http://www.itst.it/pls/itst>).

³⁷¹ We cite among all the laboratories of Piedmont, active since the late 90's, first in collaboration with the USP of Turin, then with the USR of Piedmont and other voluntary associations, specifically engaged on bioethical issues.

stimulus³⁷², as it shows, despite the small number of schools actually involved, the utility of a survey on "already" implemented projects of education in bioethics, in order not only to highlight its occasional and experimental nature, with all the related pros and cons, but also to obtain models for "good practice".

Another interesting type of investigation is aimed at identifying not so much the "already" implemented projects of education in bioethics, as what according to school experts, "should" characterize a best practice as regards education in bioethics. This is the direction taken by the investigation conducted at the Center for Bioethics at the Catholic University of Rome, which has involved about 1,200 teachers in schools of all levels in the different regions of Italy³⁷³.

Further investigation would be desirable in order to put together the analysis of what exists and the presentation of the needs and suggestions of experts, extending the sample of schools and teachers interviewed as far as possible. This empirical research may, in fact, give an idea as to "which" may be *good practices in education in bioethics*, formulated not from the outside by means of predetermined ideal models, but from inside the school world, starting with its own dynamism, needs and potential.

Irrespective of this investigation, which constitutes the first of the joint actions of awareness to promote, according to the 2010 protocol, in synergy between MIUR and NBC, from the present state of knowledge one can only note that the education in bioethics practised today in schools appears to be dispensed for the most part through "projects", conducted by teachers, with or without the help of external staff: an education marked by its spontaneous and episodic nature, involving from time to time, part of the student population in an occasional, non-continuous manner, using skills and tools that are not always adequate.

Faced with the reality of some regions, cities and schools where bioethics education can take advantage of teachers that have, in their turn, been trained as well as a network of professors and experts, there are, in fact, the opposite realities of regions, cities and schools in which all this is lacking.

Education in bioethics, due to the difficulty and importance of the pursued objective, needs, for active and responsible citizenship, the transformation of episodic education and the unequal experience gained over the years into continuous and systematic education, which can be guaranteed by the experience obtained throughout Italian territory on the basis of guidelines included in ministerial programmes.

9. Guidelines for education in bioethics in schools

9.1. Education in bioethics: a necessary task

In conclusion, it is possible, starting from the analysis carried out, to say that bioethics education in schools is a necessary task, which at the same time, is complex, and presents particular difficulties.

³⁷² Cf. A. PORCARELLI (ed), *Bioetica e convivenza civile: i risultati di una ricerca*, I.R.R.E. Emilia Romagna, Bologna 2004.

³⁷³ Cf. M. L. DI PIETRO, *Bioetica nei curricoli scolastici: il risultato di un'indagine*, in E. SGRECCIA - M. L. DI PIETRO, *Bioetica e formazione*, Vita e Pensiero, Milano 2000.

The moment that education in bioethics is put forward as a *necessary task*, we assume that there is a positive response to the first question that one should ask: *why educate in bioethics?*

Education in bioethics, as we have attempted to highlight above, is an integral part of the citizenship education of the new generations, so much so that we can speak of “bioethical citizenship” or education of the future citizen to make conscious choices in the context of bioethics, biolaw and biopolitics. The right to information, the essential core of democratic life, finds, in bioethical issues, an extremely important application. To take part in the open, free and equal debate that characterizes the “good life” of any democracy, concerning the choices that affect the lives of everyone, such as the choices related to important bioethical issues (from the environment to the care of human life), however, information, despite its playing a primary role, is not the only requirement, education is also necessary.

Education in bioethics is therefore characterized as including within it, information on bioethical issues as well as the teaching of bioethics, as it includes knowledge of bioethical issues, but it goes beyond this, and educates in “bioethical skills”, that is, formation of the capacity to formulate moral judgements, arguing and discussing them with others.

This complex and difficult education, cannot be left to chance or assigned to old and new messages of the media, trusting that alongwith the large amount of provided information there takes over a spontaneous ability as to how to navigate through complex bioethical issues. The risk that is run goes from the specific context of education in bioethics to the wider one of citizenship education, jeopardizing a fundamental right of the future citizen: to be educated to understand the issues of the *polis* and therefore able to decide freely and consciously.

From the close connection between education in bioethics and citizenship education emerge two *fundamental principles of an education in bioethics*: the principle of autonomy and that of justice. The *principle of autonomy* indicates the direction that education in bioethics needs to take, namely the formation of rational, autonomous judgement, free from ideological pressure, so as to guarantee agreement or disagreement which, in interpersonal situations or participation in collective choices, is truly aware and responsible. The *principle of justice* oversees the basic conditions of education in bioethics this requires commitment to the highest social effort so that all future citizens will be ensured a basic education of equal quality, an essential guarantee for their actual participation in the bioethical debate as interlocutors with equal dignity.

If this premise, as to why to educate in bioethics, is accepted, the answer to another question is implicit: *who to educate in bioethics?* It is clear that the recipients of this education will not only be the professionals in certain fields (biologists, biotechnologists, doctors or philosophers, jurists etc.), but all citizens or future citizens. This leads to broadening the scope of education in bioethics beyond that of universities- where the new discipline has long since found a place in our country, being present as an autonomous branch of teaching within the sectors of different scientific disciplines³⁷⁴, both in scientific

³⁷⁴ Bioethics is included in the sectors of: Forensic Medicine (MED/43), History of Medicine (MED/02) Moral Philosophy (M-FIL/03), and in the indication of Bioethics and Human Rights in the field of Philosophy of Law (IUS/20) and Biolaw, in the sector of Private Law (IUS/03).

faculties³⁷⁵ and humanities faculties³⁷⁶ - , to the school context where bioethics is still only present in an informal and discontinuous manner.

The extension of education in bioethics in schools implies, therefore, a dry response to the question about the beneficiaries (all future citizens), opening up yet another question: *when to start education in bioethics?* The answer, if education in bioethics should find a place in primary or secondary school and at what level of the latter, however, requires taking a step further, namely, coming to grips with the difficulties of the task. This will be dealt with later, in the part which addresses the difficulties of *how to educate in bioethics*.

9.2. Education in bioethics: a complex task.

At the basis of all education in bioethics, there is an idea, a definition of bioethics: as we have seen, it would be an unnecessary and redundant recollection, if there were not present today, after forty years since its inception, different ideas and definitions of bioethics, from which it is possible and, in some way, necessary, to orient oneself, and be able to choose. It is appropriate, in order to ensure that education in bioethics is aimed at participation in a pluralistic and open democratic debate to choose the aforementioned broad and authoritative definition of Warren Reich: "The systematic study of the moral dimensions - including moral vision, decisions, conduct, policies - of the life sciences and health care, through a variety of ethical methodologies in an interdisciplinary context"³⁷⁷.

From this definition it is possible to identify the complexity of bioethics education according to the two figures of *interdisciplinarity* and *pluralism* in the context of our fundamental constitutional values. According to these two figures, we can read the various questions that our theme poses³⁷⁸, questions that must somehow be resolved, if you want to find guidelines for an education in bioethical citizenship.

9.2.a. Interdisciplinarity: problems of structure and content

Interdisciplinarity brings with it a number of questions; these can be subdivided into questions dealing with structure, those dealing with content or those on teaching methodology.

The first question that arises as regards structure is: *how to place bioethics in the school curriculum?* Precisely because of its interdisciplinary nature, bioethics excludes placement within a discipline: to be understood through the study of some of its issues, in the programs of a discipline (philosophy, in most cases), as currently occurs, cannot be considered a point of arrival, but only a starting point for a broader discussion, in which the knowledge of different disciplines intersect, comparing methods and

³⁷⁵ As Medicine and Surgery, Nursing, Veterinary Medicine, Biological Sciences, Biotechnology, Pharmacy, etc .

³⁷⁶ As Arts and Humanities, Education, Law, etc.

³⁷⁷ W. T. REICH (ed.) *Encyclopedia of Bioethics*, Macmillan Library Reference USA, New York 1995. Introduction, vol. I p. XXI.

³⁷⁸ Cf. L. PALAZZANI, *La formazione in bioetica: modelli e contenuti*, in "Medicina e Morale", 1998, 1, pp.119-131.

languages. The problem that arises is whether it could identify an autonomous space for bioethics, which can mean two things: either a space for bioethics as a *new discipline* in its *own right*, or a space for an *interdisciplinary course* in bioethics. Now, the first solution meets a number of theoretical and practical difficulties. Theoretical difficulties: it seems that the interdisciplinary nature itself requires such a complex a set of knowledge and skills that it is preferable for education in school, to follow the path of dialogue and exchange between different disciplines, reserving an autonomous space for the discipline in university-type-education. Practical difficulties: the inclusion within school *curricula* which have already been outlined or have to be outlined; there is, in each case, the difficulty to 'harmonize space between different disciplines.

It seems, therefore, that the most shared and acceptable solution, which also appears in the documents of the various international bodies previously mentioned, is not to include bioethics as a discipline in itself, but to leave room for interdisciplinary courses. The form that these courses should take remains to be seen. There are basically two hypotheses that emerge:

- *interdisciplinary projects on bioethical issues*: this path has in fact already been pursued by several schools for some time in our country, and exposes the problem of its episodic nature, the use of mostly external figures, the incapacity of ensuring the participation of all students; as well as its extra-curricular aspect and the absence of evaluation all of which are inevitably weaknesses within the process of education.

- *interdisciplinary bioethics modules*: this path, identified on a theoretical level, appears to guarantee, if incorporated in a stable manner and autonomously assessed within school *curricula*, the participation of all students and provides the opportunity to address, with the same teachers of the other disciplines involved, the critical points of education in bioethics.

If, as seems appropriate, the interdisciplinary module approach is chosen, a further question requires clarification: the placement of these modules within the *curricula*, specifically, should these modules have their own *independent space* or should they be incorporated *within the space provided for the teaching of Citizenship and Constitution*. The first solution would guarantee more space and autonomy to education in bioethics, but it would face the difficulty of harmonizing this space with that of other disciplines. The second option would increase the sense of education in bioethics as education for citizenship and would also have the advantage of finding inclusion within a process already traced by law. The immediately evident difficulty is the space that education in bioethics, in itself complex, can find within this process, and on the other hand, the impossibility of its remaining, as already noted, within the subject areas identified by *Citizenship and Constitution*, being essential scientific contexts for bioethics education.

Closely related to the first question - *how to situate bioethics in schools?* – is the second, which is still of a structural nature, even if we can consider it as being midway, since the responses involve also another level, regarding contents and methods: *Who should teach bioethics?*, the teachers of which subjects should be assigned this task? It is clear that, if the path of interdisciplinary modules has been chosen, the answer to this question can only be plural, inclusive and not exclusive: not teachers in humanities *or* teachers of science, but teachers in humanities *and* teachers of science. The problem that remains, however, concerns the training of these teachers: *what kind of training for educators?*

The training of teachers is a problem which, as we have seen, is concentrated on in the documents dedicated to education in bioethics: this formation is particularly complex given the interdisciplinary nature of the subject. In order to ensure the dignity and sense of education in bioethics as citizenship education, this formation can not be left entirely to good will and chance, but must take place through institutional channels or be guaranteed by institutions. It is important in this regard to include:

- that interdisciplinary bioethics modules are to be assigned to teaching staff that has been adequately trained either by means of university courses or via acquisition through *in itinere* formation;
- that the MIUR should promote bioethical formation of the teaching staff chosen for bioethics education, through the provision of *in itinere* training programmes;
- that *in itinere* formation (master, advanced courses, refresher courses) should be entrusted to Universities or Research Centres and/or Training Centres, that have been accredited by the MIUR.

The other question, brought about from the interdisciplinary nature of bioethics, but which moves from the structural level to that of content, concerns the method by which to educate in bioethics and the teaching materials to use. Briefly, it can be reduced to: *how to educate in bioethics?*

This question does not only derive from the interdisciplinary nature of bioethics, but it also leads us to its other aspect, pluralism: it is a question of means, in which these two characteristics, that make the task of education in bioethics complex and particularly difficult, are convergent.

9.2.b. Pluralism and its questions

If we go back to the accepted definition of bioethics in the introduction we see that bioethics is said in the plural form in many ways: due to the different ethical references and also due to the different paradigms by which bioethical questions can be rethought. The question which has now become customary is *which ethics for bioethics?*³⁷⁹ contains within it another question, *which anthropology for bioethics?* Alongside these we can place the methodological question that has perturbed bioethical literature since the 80's: *which paradigm for bioethics?*

The same questions recur in education in bioethics, they can not be evaded: they are the questions that drive the transition *from the teaching of bioethics*, which should give clear information on its history, the different ways in which it is articulated through diverse ethics, anthropologies and paradigms, *to education in bioethics*, which should provide the learner with the means to orient himself within the wide interdisciplinary and pluralistic context delineated in front of him, elaborating an independent critical opinion on major issues, and gaining the ability to argue and discuss with others, accepting the challenge of comparison with different and sometimes conflicting moral judgments.

It is the transition which, as noted, was insisted on in the Opinion of the NBC *Bioethics and education in the health care system*, from "the ability to

³⁷⁹ E. AGAZZI (ed.), *Quale etica per la bioetica*, Franco Angeli, Milan 1990.

know” to “the ability to do” and to “the ability to be”: a passage which in the context of the bioethics education of the future citizen can be explained as “the ability to know”, “the ability to judge”, “the ability to choose”:

- “the ability to know”, that is, to acquire a clear understanding, as objective as possible, even if essential, of the scientific problem that motivates the ethical question (for example: what is in vitro fertilization and how does it take place);

- “the ability to judge”, that is, to have the basic elements to express a pondered moral judgement (situational analysis, reflection on the principles at stake, etc.)

- “the ability to choose”, that is, to be a citizen able to participate in an informed way in the decisions that civil society takes on bioethical issues, comparing one’s own moral judgement with those of others.

The question that can be raised is whether within this education, in addition to the two fundamental principles previously identified, - the principle of autonomy and the principle of justice - there are fundamental values. In the International documents examined is possible to identify a double level of discourse between two statements that are not mutually exclusive, and which do not collide with each other: on one hand, the assertion that education in bioethics should be the preparation for participation in an open and pluralistic debate; and on the other, the affirmation of certain principles and ethical values of reference, such as the dignity, integrity, accountability, equality, justice, equity, solidarity, respect for diversity. To these we can add, following the *Barcelona Declaration* of 1998, the care of vulnerability. There are, in fact, two mistakes to avoid: a dogmatic education which imposes values and a neutral education, which describes values; both are a-critical methods which do not allow for problematization and a critical awareness. The path of education must relate to the fundamental ethical values expressed in the Constitution and in the International Charters in response to techno-social issues.

It is true that these values are themselves subject to interpretation, and that bioethics is the place where the boundaries of personal human life are called into question, thus opening up to different and conflicting interpretations of the same fundamental values. This means that in education in bioethics not only scientific knowledge is important to understand the “facts” of bioethical issues, but also philosophical knowledge, especially ethics and anthropological philosophy, in order to understand both the meaning of reference values and the diverse interpretations of these values. Education in bioethics is given within the pluralist context that characterizes our time, in an attempt to provide the means by which to choose between ethical and anthropological perspectives, to make value judgements, and argue and discuss them in free and democratic debate.

A difficult and complex task, far more than that of accomplishing a dialogue between disciplines which are different in language and method. It is, however, an unavoidable task, registered at a time when bioethics is maturing; this difficulty returns in some of the questions we have left unanswered, outstanding or not yet asked.

The first, which we must now go back to is, “*when to start education in bioethics?*” In the documents and literature taken into consideration, the decision to start at secondary school level is endorsed, given the level of maturity already achieved by its learners: education in bioethics should be

considered on a par with philosophical education, as appropriate to the determined development of the critical sense and moral ego.

The opportunity to adapt education in bioethics to the different stages of maturity of the student is now clear, from the stages of cognitive development to those of the moral ego, however the question to be asked is whether there can be a gradual education in bioethics, which, depending on the issues discussed and the ethical problem that are connected, ensures respect for the timing of maturity and also coherent and progressive preparation to the more complex issues. In this sense, the *Philosophy for Children* could provide an example of best educational practices in formation, through narration of the critical sense and moral judgement even in primary school.

The application of similar methods to the contents of environmental bioethics or animal bioethics could constitute a path for an education in bioethics that starts from the first moments of schooling, in continuity and graduality.

The difficulties involved in the pluralistic nature of bioethics return and intersect with those related to interdisciplinarity, even in a second question: *which method of education in bioethics?*

From documents and literature, emerges the convergence on a number of teaching methods that we can indicate as *laboratories of bioethics*, where issues are discussed in small groups, making the knowledge of scientific and ethical aspects of the problem interact with the discussion of some specific cases. The integration of the two methods, deductive and inductive seems, in fact, the key to better facilitate the development of the capacity to formulate moral judgments on problematic situations³⁸⁰.

This teaching method which should comprise interaction of the languages and methods of disciplines, starting with the collaboration between teachers of the different disciplines, returns also to the other question: *which educational tools for education in bioethics?* The Council of Europe has given on this subject an indication which counters that of the many existing manuals on bioethics for schools: not a systematic study, clearly oriented to a model of bioethics, but didactic modules, which can be defined as illustrations of issues (*Educational Tool on Bioethical Issues*), that give each time scientific knowledge, knowledge of the ethical principles involved, the different ethical perspectives, examination of cases, bibliography for in-depth study. The formula of the *Educational Tool* has, as we have seen, the advantage of reconciling two requirements: the accounting for different languages and methods, in simple form, and also the accounting for various ethical perspectives, thus fostering the development of independent moral judgement, which are as aware as possible.

The proposal submitted to schools is that of due informed and critical attention to the material prepared by the NBC during its twenty years of activity. In these texts, in fact, the NBC is true to the double soul of bioethics, interdisciplinarity and pluralism, by both exposing the scientific aspects of the question, and by accounting for the connected ethical problems, according to the different ethical perspectives that emerge, also in light of the International perspective, particularly in Europe³⁸¹.

³⁸⁰ Cf. L. PALAZZANI, *La formazione in bioetica: modelli e contenuti*, op cit

³⁸¹ It would also be desirable, in line with an emerging trend also in other European countries, to activate on the NBC website a discussion forum where members of the Committee may, with

Summary and Recommendations

In order to respect the objective of education in bioethics as citizenship education it is recommended that this education be conducted in a manner which:

- guarantees that younger generations receive a basic preparation to participate actively in the bioethical debate, ensuring equal opportunities for information and formation and promoting the development of independent moral judgement and a critical consciousness on the major issues of bioethics, in compliance with fundamental ethical values in a pluralistic and democratic society;
- progressively carries out in a manner consistent with the gradual development of critical thinking and moral judgments, matching to this development the study of issues concerning the principles of science as well as the ethical and legal issues, within the historical and social context;
- is carried out in a continuous and not episodic manner, through interdisciplinary modules on bioethics;
- is entrusted to teachers that have been adequately trained by the competent bodies;
- is conducted through pedagogical methodologies and teaching tools consistent with the educational objectives, starting from the documents of the Italian National Bioethics Committee and International organizations.

A Personal Remark signed by Professor Carlo Flamigni

If a member of the NBC has to write a codicil of disagreement relating to a document approved by a so-called "majority" it clearly means that this majority did not agree to enter his dissent in the document. This refusal, in this case legitimate (but, in my opinion, the outcome of a completely wrong initial choice) is due to the fact that the aforesaid "majority" has decided that the Italian National Bioethics Committee must carry out a "prescriptive" task and not a "descriptive" one, and has chosen not to follow the example of almost all the other National Bioethics Committees. I persist in writing "majority" in quotes because I do not think that there can be any majority in a consensus which has not been established according to the rules of democracy, but purely on the basis of arbitrary criteria (where, in fact, are the representatives of Protestants, Muslims and Buddhists within the NBC?) and why one should solve disagreement on moral issues through voting is, in my personal opinion, simply ridiculous.

The NBC has discussed this topic several times, choosing, somewhat paradoxically, to settle the question put forward by some members regarding the unsuitability of putting to the vote the different moral positions that emerged by putting it to the vote. In the documents that I have examined the so-called "descriptive paradigm" is described as the one giving 'the most

the collaboration of experts from the Scientific Secretariat, respond to requests for clarification or further development by teachers and students.

importance to the rational aspect of ethics, this aspect leads to recognition of the existence, in the conditions typical of open societies, of a plurality of values. By adopting this paradigm the Committee shows that in Italian society it is possible to identify, within the complex problems of bioethics, a plurality of solutions, some of which supported by clear and rational reasons, while others lack obvious and acceptable justification. The Committee would, in this way, become the authoritative place, where the principle bioethical dilemmas of our time are clarified, without claiming to possess the key to truth, the only one that could help to draw up judgements that could not be challenged. In this way public opinion could recognize, in the plurality of positions, a source of opportunity rather than a cause of disorder; politics, for its part, could much more easily and responsibly carry out its rightful task, namely to mediate and choose. All this, entrusted to the force of reason and not to abuse of the majority vote: the receiver of a descriptive opinion can freely evaluate the various arguments and choose those that seem more convincing. It is now clear that those who know they can not rely on rational arguments, but only on revealed truth, are unable to accept such a reasonable solution, the false rationality of religious and confessional bioethics would not hold up in comparison.

At this point it seems obvious to me that to define the documents of the NBC as neutral and pluralistic is unfair and it is just as wrong therefore that they be indicated, in the document, as fundamental texts to be referred to for the teaching of bioethics in schools: in point of fact there are very few "descriptive" documents written by the NBC, they are practically all of a prescriptive nature, this is the natural consequence of the fact that minority opinions have been limited to the codicils of dissent, attached to the main document in theory, but intended to be ignored by everyone (as I myself have demonstrated on several occasions). To be more precise, almost all the documents of the NBC are documents of "catholic bioethics" accepted and not granted that such an anomaly should actually exist.

Therefore this document, neither do I underestimate its importance nor do I ignore its interest, loses all its fundamental qualities because it contains a statement which does not correspond to the truth, which is absolutely unacceptable especially for a work that is aimed at educators and young people. The fact that I am the only one to disagree with it demonstrates the little worth of the choice to proceed by majority votes and however it does not tell the whole truth about the positions taken by members of the Committee on this issue. If I look back to the past, I can recall that totally comparable positions to mine were taken by Eugenio Lecaldano and Carlo Augusto Viano, this can be easily verified (the first request to the Presidency not vote documents dates back to 1990 and was made by Professor Lecaldano and myself). Naturally, I will not refer to the current members and the positions taken by them during the internal discussions of the Committee, which must be kept confidential, but I have found a recent public statement made by Professor Luca Marini, vice-president in charge, which I think I can cite. Copying from *LEFT* (July 16, 2010, pg.66) a piece of an interview. When asked "what scenarios can open up to Italian bioethics" Professor Marini replied: "... The greater sensitivity to the political and media dimension of bioethical issues has been followed by an instrumental attitude by the media that, irrespective of the roles and functions of the Committee, have given an *authoritative value to the opinions of that body, for its purely advisory nature*. The trend towards prescriptive bioethics has

created favorable conditions for the use of the Opinions of the NBC not only as a support but even *as the basis of supposed acts intended for regulation...* It has provided the public with a distorted image of the tasks and role of the NBC which is and *remains at least for the time being, reflection on bioethics and not juridical and regulatory legitimization*". On the other hand it would be easy, but totally pleonastic, to quote the statements of the Catholic members of the Committee in favor of prescriptive bioethics and full of absurd paean against the unfortunate "codicils".

As I have written many times, therefore, the choice to produce documents of prescriptive bioethics is the result of the desire to give voice to the principles of Catholic morality, an option that dates back to 1990, the date of the establishment of the Committee, a choice that no one has challenged with sufficient vigour (and I also feel responsible for this). I accept *oborto collo* that by so doing the opportunity has been missed to give the country a secular bioethical culture for which evidently the need is felt everywhere, but I find it wrong and dangerous that such questionable statements (this is an understatement) be included in a document intended for educators.

A Personal Remark signed by Profs. Antonio Da Re and Vittorio Possenti

While agreeing on the desirability of introducing elements of teaching and education in bioethics in upper secondary schools, this personal remark would like to draw attention to certain points of considerable criticism that have not been adequately addressed in the document "Bioethics and education in schools".

There is the serious problem of how such teaching and education can actually take place in high schools with young students in the decisive phases of their human, moral and cultural growth, contending with a multiplicity of knowledge, content and use of different methodologies, due to various reasons to the subjects comprising in their scholastic path. Within this already complex and challenging path a place should now be found even for a specific bioethics education, located within the teaching of "Citizenship and constitution."

In our opinion it is inappropriate that nuclei of education in bioethics should be included within this framework, since bioethics is a discipline that calls into question many more problems, criteria and principles than those that can be managed within the context of `citizenship and constitution`. Perhaps the least inappropriate solution is to entrust the task of giving bioethics lessons to the philosophy professor, who would act as a coordination point for other colleagues, especially those of science: this approach could ensure the education of the fundamentals and critical thinking that are indispensable, but which may be put on notice if the teaching of philosophy is no longer granted an adequate number of hours per week and annually, as provided for in the new ministerial programmes of the so-called high school of human sciences. If these questions are not dealt with, the call for education in bioethics becomes nothing more than a noble aspiration.

The difficulties inherent to the teaching of bioethics are probably underestimated, and not only because it is a relatively new subject and on an epistemological level, it is not yet fully consolidated. The very nature of bioethics requires the convergence of a multiplicity of skills and methodologies; it should be interdisciplinary and therefore should establish itself as a meeting

point and point of synthesis for scientific, biomedical, clinical, ethical, legal, philosophical, historical, and anthropological knowledge. It goes without saying that it is extremely difficult to succeed in creating dialogue between different languages and methodologies, so it is improbable that bioethical knowledge can reach a truly interdisciplinary perspective, at best, it may be proposed as a kind of multi-disciplinary perspective. This difficulty is well known to university bioethics scholars and professors and those of the most qualified international research centers; which explains why it defies analysis and simplistic interpretations or reductionist methods.

The very real risk is that of undue simplification. Moreover some teaching tools, already present on the educational publishing market, show how this fear is not unfounded: instead of problematizing the bioethical issues in an interdisciplinary perspective or at least a multidisciplinary one, often they merely repeat stale *clichés* (secular bioethics vs. Catholic bioethics; paradigm of the sanctity of life vs. availability of life, and so on) The intent of this conceptual rigidity seems to be to want to mark the field in which each should stand (or be positioned by others), preconceiving from the very outset the solution to be reached from the analysis of the bioethical issues discussed each time. It is extremely doubtful that this goal is in actual fact educational.

There are two further problems. The opinion refers to the recent Memorandum of Understanding in which the Ministry of Education and the NBC undertake to "promote joint initiatives so that education in bioethics may become an integral part of scholastic education, in order to ensure equal opportunities to the new generations to participate in the public debate on the ethical, social, and legal issues raised by scientific and technological progress". This is a demanding commitment, but strictly speaking, it lies outside the institutional tasks of the NBC, which basically are to "formulate opinions and provide solutions, including for the drafting of legislation" (see the decree of 28/03/1990), in the face of scientific and technical developments and the new clinical applications that affect human life and health. It is true that alongside this duty to advise the Government and the Parliament, the decree also entrusts to the NBC the task to "promote proper public information", but perhaps it is excessive to draw from this the conclusion that the NBC should be systematically concerned with education in bioethics in schools.

It is a different story as concerns the use of the numerous and elaborate documents prepared by the Italian NBC during the last twenty years. In the last lines of the Opinion on 'Bioethics and school', the importance of the privileged knowledge of the documents of the NBC itself and those of similar International organizations is upheld. No objection in general, but if promotion of the teaching of bioethics in high schools is considered to be appropriate, this can not start with the knowledge of the opinions of the NBC: not because they convey "State ethics" or a dogmatic view (criticisms sometimes expressed, although perfectly unfounded and instrumental), but because these opinions due to the high complexity of the issues and their specialist level originate for very different purposes from those of their possible use for education and teaching. In other words, the documents of the NBC are not teaching tools appropriate to the educational objectives of the teaching provided in a secondary school, which can inevitably set aside only few hours and which must start at an *absolutely basic* level. This characteristic is difficult to

eliminate, even resorting to simplified drafts of the aforementioned opinions. If at all, they can usefully contribute to 'educate the educators'.

A personal remark signed by Prof. Andrea Nicolussi

To clarify my vote in favour of the document on *Bioethics and education in schools*, I would like to make the following brief observations.

The introduction of bioethics in schools – a very complex subject even because it is characterized by a strong interdisciplinary intertwinement, and often unfortunately the ground of ideological disputes – should represent, in my opinion, an opportunity to foster in students particularly a philosophical awareness of the issue. It, in other words, should be an opportunity not to replace the basic teachings that the bioethical issue must be put in relation with, but to integrate these teachings. In this perspective, bioethics should help to educate students to give thought to the problems aware not only of the different skills required, curious to the different points of view and demanding in terms of arguments and counterarguments, but also generally sensitive to the fundamental questions to which these problems conduct.

Presidenza del Consiglio dei Ministri



THE IMPROPER USE OF PLACEBO

29th of October 2010

PRESENTATION

The opinion has been drawn up by Prof. Silvio Garattini, coordinator of the working group composed by Profs. Roberto Colombo, Lorenzo d'Avack, Marianna Gensabella, Laura Palazzani and Monica Toraldo di Francia.

The document is in line with the documents, already drafted by the NBC, on the subject of drug testing, and addresses a specific issue, the abuse of placebo. The document emphasizes that the use of placebo is not necessary if the investigator applies a superiority design to an already approved drug and precautions are taken regarding the high number of patients, the duration of the trial and above all the adoption of parameters for assessment of therapeutic effects. It is obvious that the comparison with a placebo instead of an active drug in itself favours the new drug seeking approval: but ethically the possible experimental advantage must be balanced against the current therapeutic needs with regard to the patients. The NBC emphasises the unethicity of improper use of placebo as it would deprive the patient of a useful drug. On the basis of this it draws attention to the role of ethics committees to ensure that commercial interests do not prevail over the right of patients not to be treated with placebo when an effective treatment is already available for a given therapeutic indication.

The document was discussed in the plenary session on the 29th of October 2010 and approved in unanimity of those present: Profs. Salvatore Amato, Luisella Battaglia, Bruno Dallapiccola, Antonio Da Re, Lorenzo d'Avack, Riccardo Di Segni, Carlo Flamigni, Romano Forleo, Silvio Garattini, Marianna Gensabella, Laura Guidoni, Aldo Isidori, Assunta Morresi, Demetrio Neri, Vittorio Possenti, Giancarlo Umani Ronchi, Grazia Zuffa. The adherence of Professors Stefano Canestrari, Maria Luisa Di Pietro, Laura Palazzani, Rodolfo Proietti, Monica Toraldo di Francia, absent from the discussion, was subsequently received.

The President
Prof. Francesco Paolo Casavola

DOCUMENT

Placebo (from the Latin “*piacerò*”) means any harmless substance or any non- pharmacological intervention lacking in therapeutic efficacy. It is precisely for this prerogative that placebo is purposely administered to the person who in due course may consent to take it as an alternative to an active treatment to experiment efficacy and safety. The use of placebo is therefore legitimate only for experimental purposes and only with the informed consent of the patient. According to the Declaration of Helsinki, in addition, the use of placebo is legitimate only if there are no treatments of proven efficacy for the clinical situation subject of experimentation, save for there being important methodological reasons adequately appraised in the interest of the patient and on condition that the patient does not seriously run the risk of irreversible damage. * The conscious cooperation of the patient is therefore required in situations in which medicine, affirming its difficulty in deciding, must proceed through experimentation. To administer a potentially effective new drug outside of an experimental context would expose the patient to the risk of unknown toxicity; refusing to administer it *a priori* would deprive the patient of the possibility of benefiting from its possible positive effects. The only ethically and scientifically valid solution is experimentation: arbitrary testing (randomization) will distribute a potentially effective treatment or a placebo to a population of patients and the comparison of the clinical outcome in the two treatment groups will consent to conclude whether the experimental drug is superior to placebo. The administration of placebo, in a formulation identical to that of the experimental drug maintains the blindness of the investigator and/or patient to the treatment; in turn, the blindness, or ignorance of the investigator and / or patient to the treatment assigned by chance, prevents voluntary or involuntary influencing that can affect the outcome of the trial, for or against the experimental treatment.

However, scientific literature contains significant examples of situations where the direction dictated by the Declaration of Helsinki is not followed (1). Supposed scientific reasons or commercial interests related to the approval of a new pharmaceutical product or new therapeutic indication by the regulatory authority expose patients to the risk of not receiving an effective drug.

The use of placebo is encouraged by the current legislation in the pharmaceutical field, this requires that new drugs prove their quality, efficacy and safety but without any need for comparisons with active comparators or any evidence of added value, for example an increase in the efficiency or a decrease in the toxicity (2).

This document takes into consideration three areas of improper use of placebo: 1) the case where a comparator is available, 2) the case of the *add-on* methodology, and 3) the case of trials with three arms (*three-arm trial*).

* Declaration of Helsinki:

Article 32. The benefits, risks, burdens and effectiveness of a new intervention must be tested against those of the best current proven intervention, except in the following circumstances:

- The use of placebo, or no treatment, is acceptable in studies where no current proven intervention exists; or
- Where for compelling and scientifically sound methodological reasons the use of placebo is necessary to determine the efficacy or safety of an intervention and the patients who receive placebo or no treatment will not be subject to any risk of serious or irreversible harm. Extreme care must be taken to avoid abuse of this option.

1) Availability of a comparator

It is obvious that the comparison with a placebo instead of an active drug in itself favours the new drug seeking approval. But what matters is that, if the placebo is used improperly, the patient is deprived of a useful drug. Examples of this type are not rare in the scientific literature related to *clinical trials*. Recently, denosumab, an anti-osteoporosis drug for menopausal women was evaluated compared with placebo (3), when in fact there are several drugs available for osteoporosis such as, for example, tamoxifen for prophylaxis and bisphosphonates for therapy. Similarly, the fingolimod, a drug for the treatment of exacerbations of multiple sclerosis, was initially assessed in comparison with placebo (4), although in reality interferon beta was the treatment of choice in current clinical practice. Even cladribine, an immunosuppressant drug, was used for the treatment of multiple sclerosis versus placebo, although there were already on the market glatimer, copaxone and interferon beta for the same indication (5). Sometimes resistance or intolerance to the drug is the reason provided to avoid "head-to-head" comparison. Sunitinib proved more effective than placebo in the treatment of gastrointestinal stromal tumor (GIST) resistant to imatinib (6). However some patients assigned by randomization to the placebo group may have benefited from continued treatment with imatinib or a gradual adjustment of its dose (7).

Sometimes the use of placebo is artificially justified assigning it only to the subgroup of patients with the same disease, an approach known as "salami slicing" for the progressive selection and diminishing of the target population in the experimental treatment. All this is justified because in current clinical practice even these subgroups of patients would still receive the standard treatment, therefore, it is unacceptable to subtract patients from therapy and expose them to placebo.

2) Add-on studies

Treatment of proven clinical efficacy is sometimes used as a common basic treatment for all patients who are then randomized to receive in addition (*add-on*) a new experimental drug or placebo. This approach is certainly acceptable when there are no other drugs to be added to the basic treatment, but in many cases the availability of other drugs is deliberately not considered. For example, in a trial in patients with diabetes, the common basic treatment was a combination of metformin and a glitazone. These patients were randomized to receive exenatide in addition, a new drug that acts on PPAR- α (peroxisome-proliferator-activated receptors), or placebo. The results clearly favored the triple treatment including exenatide (8), but the comparison is not correct, because the placebo could be replaced by a derivative of the sulphonylurea, for example, or another of the many drugs used to control hyperglycemia in diabetes. In the mentioned *trial* it would have been possible to offer patients a better treatment than the placebo. Another example of this is the treatment of rheumatoid arthritis, a disease for which the drug of choice was methotrexate (9, 10). Again the experimental design according to the add-on strategy provides that methotrexate (or another immunosuppressant) is used for all patients, and these are then randomized to receive placebo or a new drug, for example, an inhibitor of TNF- α (tumor necrosis factor). However, this approach could be justified for the first inhibitor of TNF- α but it certainly

was not admissible when for example the effectiveness of infliximab was rated (11, 12). In fact, instead of placebo, etanercept should have been used, which had already been approved for this indication (13).

It is clear that in all these cases the patients treated with placebo were damaged because they did not receive the best treatment available. The commercial interest related to achieving favourable results for the new drugs, prevailed in the choice of experimental design of the clinical trials.

3) Three-arm studies

In many cases the use of placebo is part of a study with three treatment arms: in addition to placebo, the reference drug and the new drug. In these studies, the use of placebo is adopted to allow further validation of the standard treatment, whose effectiveness is still doubtful. This is the case with Hypericum Depression Trial Study (14) in major depression. In this study, neither sertraline nor hypericum have demonstrated to be different in a statistically significant way from placebo in relation to the two primary measures of outcome adopted: the Hamilton Depression Scale (HAM-D) and Clinical Global Impression Scale (CGI-I). An effect on these scales was recorded in 38.1% of patients treated with hypericum, 48.6% in those treated with sertraline and 43.1% in the placebo arm. These results were difficult to interpret: in the light of the surprisingly high placebo effect the study was probably underpowered, since the underlying assumptions for the test included a 20% difference in complete response between each drug and placebo (15).

However, even though in three arm studies the standard comparator is not different from placebo, one must consider that in current clinical practice, patients still receive the reference drug. Therefore, the presence of placebo does not add any new information, although it forces a group of patients to be deprived of any treatment.

Sometimes such an approach takes on the characteristics of questionable ethics. This is the case of severe acute post-surgical pain in women undergoing abdominal hysterectomy, which is usually controlled by subsequent doses of opioid analgesics. A study intended to assess the efficacy and safety of tapentadol, a centrally acting pain medication, included a period of 72 hours after hysterectomy during which the patients were treated with blind tapentadol (three doses), or 20 mg of morphine, or placebo (16). What is the purpose of leaving 169 out of a total of 854 women without pain control? The declared hypothesis of the study was that at least one dose of tapentadol would prove superior to placebo in controlling pain for 24 hours.

What may prevent the adoption of the placebo is the research of the superiority of the new drug in terms of its better efficacy or safety compared to the current reference drug. In this case there is no need to have an "arm" with placebo, because the study will show whether the new drug is better than the treatment that is considered as a current standard or current clinical practice. However, what requires the presence of placebo is the design of non-inferiority. When the effectiveness of a new drug compared to the existing one is proven accepting that a possible inferiority does not exceed the prescribed limits, it is important to ensure that the results obtained with the new drug do

not include the area of "activities" of the placebo; in other words, the new drug, even if inferior to the reference drug, but within accepted limits, must still prove to be superior to placebo. In the case of the comparison of new antidepressant drugs (SSRIs) with the old "tricyclic" products a demonstration of superiority was not dealt with and the three-arm study was resorted to in order to document nevertheless superiority to placebo. By so doing many patients were unjustly deprived of adequate treatment (17).

Exposing patients to a non-inferiority test, as reiterated by the Italian National Bioethics Committee, is unethical, not only because patients do not receive treatment in the placebo group, but also because the non-inferiority trial can not establish what is the "place in therapy" of the new drug compared to those already in existence (18, 19).

These three conditions are examples of how it is possible to derogate from the Declaration of Helsinki. Unfortunately, in these situations, the legislature and regulatory authorities do not respect the rights of patients. European legislation does not require any added value for new drugs. Therefore, the European Medicines Agency (EMA) can allow market access to new drugs simply on the basis of their intrinsic effectiveness and safety, and as such may be determined in comparison with placebo with no need for active comparators. If legislation required verification of the existence of "added value", studies for superiority in effectiveness and safety should always be carried out.

For its part, in the USA, the FDA (Food and Drug Administration) finds it difficult to interpret the clinical trials with active control (20) as these studies are too small to demonstrate a reasonable clinical difference and are affected by all kinds of shortages which tend to hide the differences; moreover in the absence of a placebo group a result of no difference in the study with active comparator may mean that both drugs are effective, that neither of them is, or simply that the study is not able to distinguish an effective drug from one that is not effective. In fact, all these problems can be solved without the need for placebo, provided that a superiority design is applied to an already approved drug and precautions are taken regarding the high number of patients, the duration of the trial and above all the adoption of objective parameters for evaluation of the effects.

Despite these discouraging assumptions, the FDA's decision not to accept non-inferiority studies on antibiotics (21) and a similar recommendation by the EMA limited to studies on anti-Parkinson drugs (22) and anti-Alzheimer drugs (23) look promising as to the possibility of reducing the inappropriate use of placebo. Meanwhile it is for ethics committees to ensure that commercial interests do not prevail over the right of patients not to be treated with placebo when effective treatment is already available for a given therapeutic indication.

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Presidenza del Consiglio dei Ministri



**THE IDENTIFICATION OF THE HUMAN BODY:
BIOETHICAL ASPECTS OF BIOMETRICS**

26th of November 2010

PRESENTATION

The document addresses the subject of “biometrics”, that is, new techniques for the identification or ‘measurement’ of the human being through the detection of specific physical and behavioural characteristics which are reproduced in the form of mathematical sequences and stored in electronic databases. The text begins with a synthetic description of the state-of-the-art in terms of science and technology it pinpoints the biojuridical and bioethical issues, within the context of a reflection on the body and on the need for safety and privacy.

The NBC focuses on the advantages offered by the use of these new technologies for the safeguarding of public order within interpersonal relationships and highlights the possible risks arising from uncontrolled misuse, with particular reference to discrimination, stigmatization or social exclusion. The NBC expresses several recommendations for the protection of the individual (the use of biometrics only for reasons of necessity, used with proportionality, with informed consent and recognising the right of access to data and the so-called 'right to oblivion') and for the regulation of biometric applications, internationally and nationally.

The document was drawn up by the coordinators of the working group, Profs. Salvatore Amato and Cinzia Caporale, with the collaboration, for the scientific and technical aspects, of Dr. Mario Savastano, Senior Researcher at the CNR in Naples and an expert in this field. The group was attended by Profs. Luisella Battaglia, Riccardo Di Segni, Giancarlo Umani Ronchi, Monica Toraldo di Francia, Grazia Zuffa. The document was unanimously voted by: Profs. Salvatore Amato, Luisella Battaglia, Adriano Bompiani, Stefano Canestrari, Cinzia Caporale, Antonio Da Re, Lorenzo d'Avack, Riccardo Di Segni, Emma Fattorini, Silvio Garattini, Marianna Gensabella, Claudia Mancina, Assunta Morresi, Demetrio Neri, Andrea Nicolussi, Laura Palazzani, Vittorio Possenti, Rodolfo Proietti, Lucetta Scarraffia, Monica Toraldo di Francia, Giancarlo Umani Ronchi. Profs. Francesco D'Agostino and Romano Forleo absent at the plenary meeting subsequently expressed their support.

The President
Prof. Francesco Paolo Casavola

DOCUMENT

1. Preamble

The identification of human beings is a cognitive and psychological fundamental requirement demonstrated without exception in every society. It has assumed increasing importance, especially in light of security needs in interpersonal relations and in economic relations, raised in a comprehensive way in all countries and at all levels. In order to automate the identification procedures or identity verification, in recent years a specific technical and scientific discipline has been established called "biometrics" which aims to achieve these goals through the assessment of the physical and/or behavioral characteristics human beings³⁸² acquired by electronic sensors, developed by special mathematical algorithms and converted into numerical models. The characteristics should be easily measurable, specific to a particular person, or unique and unambiguous in the face of wide variability in the population, and must remain as constant as possible over time. Technological development has made the resources and tools identifying highly sophisticated, complex and efficient, increasing the opportunities and benefits, but at the same time multiplying the opportunities for social control.

The body has assumed the role of a real *password*³⁸³ that is to say, a living code of recognition that integrates and interacts with the world of machines. The uniqueness of our individual characteristics can be recognized from what we are (face, fingerprints, DNA, etc.), and what we do (voice, gait, signature, etc...). Both characteristics can also be associated with what we *have* (passport, credit cards, memberships, etc.) or *know* (PIN, access codes, etc...).

None of these elements for detection alone constitute individually a bioethical problem, but associated with each other and linked systematically and steadily through computer networks, they could profoundly affect the ways of appearing and acting of each individual, or even become an instrument of exclusion and stigmatisation. The reference is to possible misuse or real abuse as biometrics interprets the human body as a mere source of information that can be treated at times without the knowledge of the people concerned; all this for purposes other than those stated and carried out by different parties sometimes unknown or unknowable to the person involved. The problem of the protection of individual identity therefore takes on aspects that go far beyond the traditional limit of the respect of privacy, as there is the real risk of placing the identification processes, processes consequently of social and existential importance, outside the control of individuals.

In fact, if in the past biometrics had a clearly defined role and was limited to the investigative and juridical context, currently the areas of application involve increasingly large and important spheres of social life: from access to certain places, to enjoyment of particular services, traceability, with an exponential technological progress in many fields (Health protection, health care fraud prevention, protection of confidential medical information, monitoring

³⁸² There are also applications dedicated to biometric identification of animals.

³⁸³ A. Davis, *The Body as Password*, On Newsstands Now, issue 5.07, July 1997 (Wired), available (from 21/11/10) at: <http://www.wired.com/wired/archive/5.07/biometrics.html>; A.K. Jain et al, *Biometrics: personal identification in networked society*, Kluwer Academic Publisher Group, 1998.

access to restricted areas and efficiency in trade, financial and military security, border control and migration etc.) and a corresponding expansion of the market. An additional role of biometrics, which is currently marginal and in any case outside the classical definition of the scope of application of these technologies, may be constituted by a contribution to the diagnosis of diseases.

The advantages in these sectors seem quite obvious as biometric data are harder to forge, easier to use and impossible to forget or lose. The user therefore has a vested interest in a progressive increase in the use of biometrics, demanding however at the same time, even in terms of scientific and technological innovation, reliable methods of recording biometric data (*accountability*), and transparent data management systems, that are efficient and guaranteed (*reliability*).

The social requirement of *accountability* and *reliability* is closely related to governance issues in relation to the management and control of data collected nationally and internationally. The natural flow and extraterritorial nature of the information radically alters the guarantees offered by traditional forms of administrative and judicial protection with regard to the safeguarding of personal freedoms and privacy, and presents interrogatives all the more urgent the more rapid the movement of information and the intensity of trade.

There is also a widespread concern that an identification system that is more and more systematic, automatic and pervasive is likely to affect behaviour: the individual runs the risk of assuming social importance only for the traces he leaves. This relates above all to the quantity and manipulability of these traces and their "portability" in the form of a mathematical string. In addition, if it is possible to replace a credit card or request correction of erroneous data in an identity card with relative ease, it is not as easy to dispose of an algorithm that represents the body and is contained in many electronics archives. Furthermore, not only physical data can be acquired stably, but they can also be linked with personal data such as health status, tastes, habits, and for purposes that are public or private, social or individual, often unrecognized and in the absence of explicit consent. What is apparent is the technical feasibility of new and subtle forms of control, and consequently, in some respects, even the affecting of personality, at least to the extent that it may be claimed as a duty to "remain" in a biometric system and a personal responsibility for the "maintenance" of biometric data (paragraph 4.2).

Bioethical reflection is faced with a technology of fundamental importance for the quality of life of people and the stability and security of economic and sociopolitical relations, it can not help but wonder about how this technology affects the explication of spheres of autonomy and reduces the areas of non-interference. A society that is able to record and store a large part of individual behaviour and choices that individuals make every day could lose the right balance between freedom and security. If the certainty and security that biometrics will strengthen and improve, constitute the fundamental elements for the exercise of freedom and several fundamental rights, systematic and constant control of an ever-increasing and undetermined number of behaviours could in fact represent a discreet, but not less insidious form of biosurveillance, to the point of imposing, to be socially accepted, the "forced" taking of an identity. How desirable is the building of a world without oblivion? A world where everyone has value even based on the quantity of "traces" that are stably and definitively entrusted to the algorithms of biometric mechanisms?

Will identity as an individual right to guarantee the exercise of fundamental freedoms gradually be eroded by increasing duties of identification? Is there a right to *biometric anonymity*? To what extent can we ensure the secrecy of personal identity?

2. Introductory notes and status of biometric data

2.1 General taxonomy

Biometric characteristics represent the biological or behavioural features of an individual from which the information used for biometric recognition can be extracted.

The essential properties that biometric features should have for the purpose of biometric authentication are:

- *universality*: each individual should have the biometric feature;
- *distinctiveness*: the element of biometric reference should allow to distinguish, to the greatest extent possible, each individual from all others;
- *permanence*: the element used for biometric analysis should guarantee over a period of time a certain level of recognition;
- *collectability*: the biometric feature should be quantitatively measurable and inserted into a stable system of detection.

Assuming that 1) any biometric process begins with inclusion of the particular subject in the system and that 2) from the subject's biometric features a mathematical model called *template* is generated; for biometric technologies, there are two operating modes that have a completely different value both from a technological and legal point of view:

A. the "Identification" mode attempts to assign an identity to a given subject through a "one-to-many" match comparison technique between the *template* of the biometric traits of that subject, which is generated at the time of the transaction, and all the *templates* present in a given archive and related to a set of subjects. Generally, each *template* contained in the archive corresponds to an identity, and therefore discovery of the *template* which, within a tolerance band, has the highest similarity, is equal to identification of the subject. Even if the biometric data of the subject were not contained in the archive, this would still be of some use as it could be excluded, within a reasonable margin of error that the given subject belongs to that specific set of subjects;

B. the "Identity Verification" mode attempts to determine whether a person is who they claim to be. The procedure consists in a "one-to-one" match comparison technique between the *template* of the biometric features of that subject, which is generated at the time of the transaction and a specific *template* present in a given archive. For example, by keying in a PIN the subject indicates to the system the *template* already present in the archive with which to make the comparison that will verify whether or not the person is who they claim to be. The "Verify Identity" mode can also directly carry out through comparison of the *template* created at the time of the transaction with the one stored in an electronic map in the possession of the person concerned, all to the benefit of an increased level of the protection of personal data as the

subject does not have to deposit the *template* regarding biometric features in an archive.

Other distinctions that are commonly made in the sphere of biometrics, with important consequences in ethical and legal terms, classify application contexts as³⁸⁴:

- *manifest or hidden*: Depending on whether or not the user is aware of being subjected to a biometric identification system (most of the applications are manifest, however some applications, related to police investigations or the maintaining of public order, may be hidden);

- *characterized by accustomed or unaccustomed users of biometric technology*: according to whether the user population has or lacks experience in the use of biometric systems;

- *attended or unattended*: according to whether the biometric system is staffed or not, supervised or assisted by an operator;

- *situated in standard environmental conditions or not*: depending on whether the system is or is not likely to operate in standard environmental conditions (i.e. with temperature, humidity and lighting values that are within a certain range of tolerance);

- *public or private*: depending on whether the users of the system are in public areas (e.g. an automatic border control) or in private areas (e.g. access to the home);

- *open or closed*: depending on whether the acquired biometric data reside solely in the logical or geographic place of the application or whether they can be exported to other applications.

Further classifications also include: (a) the distinction between *cooperative or non-cooperative* applications, depending on whether or not the consent and cooperation of the actual subject is required to carry out the process of authentication/identification; (b) the distinction between *positive* biometric identification, in which the person provides proof biometric of actually belonging to a given set (e.g.: to belong to the group that has to collect a pension), and *negative* biometric identification, in which the subject states according to their biometric credentials that they do *not* belong to a given set (e.g.: they are not among those who have already collected their pension).

Finally, some experts distinguish between biometric technologies that allow both identification and verification of identity, and others that allow only the verification of identity, such as the one based on recognition of hand geometry. The difference lies mainly in the inherent capacity of the biometric feature examined to distinguish between users. The parameters measured in hand geometry do not vary significantly in the population: this means that it is impossible to carry out identification, but it does not preclude verification processes (indeed, this is the method of choice for verification).

2.2 Stages of a biometric process and potential errors

In general, the stages of a biometric process are the following³⁸⁵:

³⁸⁴ J. Wayman et al, *Biometric Systems, Technology, Design and Performance Evaluation*, Springer, 2004.

³⁸⁵ Idem

- *acquisition of the biometric feature*: in this phase, the user presents their biometric credentials to the system (that is, their biometric characteristics) through a *sensor*;

- *transmission of data*: the acquired data is transmitted from the sensor to other parts of the biometric system for further processing; the sensor may be near or at some distance from the rest of the system and it is important to assess this parameter in terms of the risks of vulnerability of the system (misappropriation of data captured along the way), and also for the possible deterioration of the quality of the information;

- *the processing of data*: in this phase, data are prepared for the subsequent stages of the biometric process; a crucial operation that is completed at this stage is the generation of the *template*, that is to say, the mathematical model corresponding to the biometric data acquired;

- *storing the template*: during registration in the system (*enrollment*), the *templates* are stored within the system for subsequent activities of comparison of data;

- *comparison*: the *template* presented at the time of the transaction is compared, in terms of the measurement of similarity, with one (verification mode) or more (identification mode) stored *templates*;

- *validation / matching*: on the basis of measuring acceptability against a preset threshold value, the system can validate a "Verify Identity" or, in identification mode, generate a list of possible candidates characterized by a "*matching*" score; the system assigns the person in the transaction the identity of the candidate with the best "matching" score.

Performance of a biometric system is evaluated on a statistical basis and is a function of a great number of parameters. Like any system of statistical comparison, biometric identification includes margins of error whose magnitude depends on the type of biometric feature used³⁸⁶. Basically, changes in environmental conditions, registration, and data acquisition, as well as physical changes (temporary or permanent) or the time between *enrollment* and the biometric transaction play a key role by reducing the chances of recognition.

Some important parameters that measure the accuracy of a biometric system are³⁸⁷:

- *FAR (False Acceptance Rate)*: false acceptance rate, which denotes the number of times a system provides an inappropriate indication of exceeding the threshold value of "similarity" between the acquired data and the stored data; in a system with a high value of FAR, there is an increase in the possibility of granting access to a place or to a service to an impostor;

- *FRR (False Rejection Rate)*: false rejection rate that denotes the number of times that the system provides an inappropriate indication of failure to exceed the threshold value of "similarity" between the acquired data and the stored data; in a system with a high value of FRR, there is an increase in the

³⁸⁶ For example, errors made by a system for face recognition are usually higher than those found in systems based on fingerprint or iris recognition.

³⁸⁷ See, for example, Encyclopedia of Biometrics, S.Z.Li editor, A.K.Jain Editorial Advisor, Springer Science + Business Media LLC, 2009; R. Bolle et al., Guide to Biometrics, Springer-Verlag New York Inc., 2004; A. J. Mansfield, J. L. Wayman, Best Practices in Testing and Reporting Performance of Biometric Devices, Version 2.01, August 2002, available (on 21.11.2010) at: www.cesg.gov.uk/policy_technologies/biometrics/media/bestpractice.pdf.

possibility of wrongly denied access to a place or service to a user who is however duly authorized³⁸⁸;

- ERR (*EER, Equal Error Rate*): the values of FAR and FRR describe two curves that depend on the threshold value of the biometric system. The point of intersection between the curves of FAR and FRR (where the two error rates assume the same value) gives the EER value, which, is essentially a measure of the global accuracy of a biometric system, it can be very helpful in determining which system is more appropriate in a given scenario.

For operational purposes, it is clear that to achieve high levels of safety in applications it is necessary to pursue a low FAR (in this case, in fact, the main concern is that the system will not improperly accept unauthorized individuals). However, by setting a stringent threshold of acceptance of biometric credentials, there may be a significant rejection rate (many people may be excluded from access to a place or a service). Similarly, if the imperative were the smallest possible rejection rate (FRR), for example, to facilitate quick access to a large number of users, the system should be designed so as to significantly reduce the acceptance threshold value. However, this of course, would cause an increase in the rate of undue acceptance FAR and a consequent decrease in the level of security.

It is clear that, the search for the optimal threshold value that allows an effective balance between FAR and FRR is one of the major difficulties faced by managers of authentication systems based on biometric technologies.

Finally, in a concise overview of the parameters that characterize biometric systems one should consider that a fraction of users may be unable to register in a given biometric system or, even if registered, could subsequently be unable to complete a biometric transaction. The *Failure To Enroll Rate - FTER* and the *Failure To Acquire Rate - FTAR* correspond to these two possibilities and are closely connected to concepts of accessibility and usability of biometric systems which, as will be shown later in this document, are two key elements in the overall assessment of a biometric system.

2.3 The most widespread biometric technologies

The most common biometric technologies are based on the recognition of:

- fingerprints;
- facial characteristics;
- hand geometry;
- the vascular structure of the palm and dorsum of the hand;
- voice characteristics;
- iris patterns;
- the vascular structure of the retina;
- signature dynamics;
- keystroke dynamics;
- DNA³⁸⁹.

³⁸⁸ In practice, this type of error is the most common and, unfortunately, creates frustration and distrust of biometric technologies by users.

In terms of research, various other biometric technologies are being studied. For example, presently under verification is the potential offered by systems based on recognition of ear morphology and in the context of assessment of behavioural biometric characteristics, systems for the recognition of gait.

3. The disciplinary context of biometric technologies

The study of biometric technologies involves interdisciplinary knowledge that may be collected, in extremely general terms, in the following list:

- Electronics;
- Computer Science;
- Statistics;
- Medicine;
- Psychology;
- Ethics;
- Law.

As can be seen from the list, many of the subject areas listed do not come under a purely "technical" dimension. Their contribution becomes very significant when biometric applications pass from an experimental laboratory phase to implementation in real operating conditions. All experiences at international level have also clearly highlighted the dangers arising from a lack of consideration of medical, psychological, social and ethical and juridical aspects of biometrics.

3.1 Biojuridical profiles of biometric technologies

On the assumption that 1) the context of biometric applications is fairly large, 2) there are substantially different views on the applicability of biometric systems depending on the social and geopolitical context, and 3) the regulations especially regarding the protection of personal data is constantly evolving, it can be said that certain parameters in principle, closely related to the juridical context of protection of fundamental freedoms, govern the applicability of biometric systems. First and foremost, it should be remembered that Article 10 of the Convention on Human Rights and Biomedicine include respect of the private sphere in relation to private health information (art. 10). In addition, the Charter of Fundamental Rights of the EU, art. 8 (*Protection of personal data*) clearly indicates some basic guidelines under which "1. Everyone has the right to protection of personal data concerning him. 2. Such data must be processed fairly for specified purposes and subject to the consent of the person concerned or some other legitimate basis laid down by law. Everyone has the right to access data concerning them and to have it

³⁸⁹ DNA analysis has recently been admitted to the biometric technologies which are at the attention of the sub-committee of ISO standards (ISO / IEC JTC1 SC 37 "Biometrics") although, unlike all the other biometric technologies, at least for the moment, DNA analysis does not allow authentication in real time. The latter criterion is not covered in the canonical definition of biometric technologies and therefore does not prevent to include DNA analysis among them.

corrected. Compliance with these rules shall be subject to the control of independent authorities".

Faced with this horizon, which is still subject to definition, the law has developed a comprehensive framework of legality around the need to guarantee the right to privacy through compliance with certain fundamental values in the light of Articles 3 and 11, of the Code regarding protection of personal data (Legislative Decree. June 30, 2003, n. 196), as well as of art. 6 of Directive 95/46/EC:

- *proportionality*: the context of biometrics should be characterized by appropriately weighing up the relationship between the sacrifices imposed on personal freedom and the existence of specific security requirements. In general, the prevention of potentially hazardous conditions, both for individuals and for society, is considered a sufficient factor for the implementation of a biometric system, in the event that the same results can not be achieved in another way and with the same efficiency. In other words, the principle of proportionality is a basic principle in EU legislation and is underlined by numerous regulatory documents. It is therefore considered a crucial element in the choices regarding the applicability of biometric systems, made by the various national data protection authorities;

- *necessity*: the context in which the biometric application is implemented does not allow the resorting to other types of less invasive and equally sensitive technologies, able to achieve the same results offered by biometric technologies.

Proportionality and *necessity* must be assessed in relation to the *objectives* pursued, with particular reference to the context in which the data is entered and processed, and the *pertinent* relationship between ends and means.

One must bear in mind that respect for identity constitutes one of the fundamental human rights. Dignity and personal integrity are connected to identity. Both of which presuppose the singularity of each individual, the law must not only take account of this but also allow its greater expression in the variety of life contexts. Quoting Paul Ricoeur, Opinion No. 98 of 26 April 2007 of the *Comité Consultatif National d'Ethique pour les Sciences de la Vie et de la Santé* on the subject of "*Biométrie, données identifiantes et droits de l'homme*", he points out that identity is formed by two inseparable elements: the exteriority of the body, "mêmeté," with which we come into physical contact with others and with the world around us, and the inner biographical dimension, «ipséité», which expresses our deepest values, those that give meaning to life and around which freedom is built. The NBC agrees with this perspective. If juridical experience is based on the recognition and protection of the immediacy of physical fact, it is to permit the expression and realization of the intangible element of interiority. So in addition to the obvious benefits for social security, any improvement to the means of identification constitute abstractly also an increase in the opportunity of enjoyment of fundamental rights and the ensuring of protection of subjective positions: from the need to access and use your current account, your car, your plane ticket, to the opportunity to demonstrate participation or non-participation in a given event. Nor should it be overlooked that, in some respects, biometric data could get round the requirement of communication of highly personal information as is foreseen by current identification documents (e.g.: place and date of birth, sex, marital status, etc..),

or in another context, your health data (e.g.: infectious diseases), therefore improving the degree of confidentiality of those involved.

However, a risk not to be ignored is, that in other respects, biometric data reveals information in excess and is used for purposes that go beyond the intended purpose of authentication, resulting in a specific phenomenon which in jargon is defined *function-creep*, or "the exploitation of data"³⁹⁰ or undue expansion of the use of data. For example, DNA, in addition to genetic identity, captures information on the susceptibility to diseases in general and on individual phenotype, the method of recognition of the retina the part of the eye which is characterized by high vascularity may indicate the presence of hypertension or diabetes, iris analysis can show the use of alcohol or drugs, temperature or some characteristics of particular areas of the face can detect psycho-physical or even pathological condition. It is possible that these data are captured and then released, unknown to or even against the will of the subject. This can lead to a distorted movement of the information that, in extreme cases, could produce potentially uncontrolled disturbing scenarios.

A further source of concern arises from possible aggregation of data. Through the overlapping of biometric data with other information (such as medical, financial or behavioral information) it is possible to imagine their centralized and combined use for so-called *profiling*. Profiling can be defined as the act or process by which an individual becomes the object of special attention by observing specific characteristics or behaviours according to which, by extrapolating the information concerning him (*knowledge discovery in databases, data mining*), several profiles of attention or suspicion are created.

Profiling is one of the most used techniques, for example, to combat terrorism and implies, without judicial review, the placement of certain subjects, based on data collected without their knowledge in specific risk categories, precluding an opportunity to access some countries or to enjoy certain services. These cases of preventive and informal profiling have always been a useful part of the operational police practice³⁹¹. But now technology increases the possibility of biomonitoring to the point of being able to constitute, if applied in a widespread and indiscriminate manner, an inversion in the burden of proof by which the presumption of innocence, the foundation of the protection of individual freedom and the rule of law, could become a form of presumption of guilt. In extreme cases, a person may be forced, without having committed any specific crime, to justify his overall behaviour to show that he is not a danger. But it is also possible to hypothesise possible discrimination in access to jobs and in many other spheres of economic and social life.

Therefore the dangers of profiling should be properly emphasized, prohibiting the crossing of data susceptible to stigmatization or exclusion and allowing use only in relevant cases, legally predetermined, with adequate

³⁹⁰ EC - Working Group for the Protection of Persons concerning the Processing of Personal Data, Opinion 3/2005 on the implementation of EC Regulation 2252/2004 of the Council (December 13, 2004), on standards for security features and biometrics in passports and travel documents issued by Member States - WP112 (Official Journal L 385, 29.12.2004, pp. 1-6), adopted September 30, 2005.

³⁹¹ Strictly speaking, the origins of the investigative technique of profiling are traced back to the Fifties, when the New York police made use of psychiatry to put together heterogeneous clues designed to rebuild the possible profile of the person responsible for a series of attacks. But already in 1879 Alphonse Bertillon, a famous French police inspector, had proposed a system of anatomical measurements (including the length of arms and feet) to identify and record repeat offenders.

safeguards and control by means of organs of guaranteed impartiality. From this point of view, it would also be important to provide a right of access, tending to be unconditional, allowing each subject concerned to know what data have been collected on his behalf, by whom, for what purpose, since when and for how long.

It is to be borne in mind that the establishment of archives to permanently store some personal data of particular importance (e.g. civil or criminal records) has always been the sole responsibility of the State, strictly regulated and designed to ensure certainty in relations and public security. Today, the facility of computer storage processes multiply the technical possibilities, absolutely heterogeneous and non-codified, to build private databases. Public primacy in the establishing of identity remains tied to the duty to ensure safety, but this pre-eminence no longer corresponds to a monopoly over personal information, on the contrary, private databases (in the broadest sense of the word), now far exceed, in quantity and quality, public databases. There is also a constant mix of public and private sectors: the State takes information that tends to be private (e.g.: health, financial circumstances etc.), and the private sector takes information of public importance (e.g. identity that is required for travel, to complete commercial transactions, etc.).

All this, in some ways, makes it increasingly difficult for the citizen to verify and monitor compliance with protection rules (at times this control is purely administrative or contractual, but sometimes it is neither one nor the other). In other respects, the general use, public and private, of biometric technologies and their associated potential profiling as well as the extensive spread of archives, could make people insensitive to the risks related to protection of their privacy, creating a sense of helplessness and indifference in which it is easier for the progressive consolidation of a biomonitoring society characterized by a dangerous resignation to confusion between the physical person and the virtual person.

3.2 Essential bioethical profiles

3.2.1 The human body as password

In biometrics, the body becomes a real instrument of recognition and, therefore, to guarantee authentication new and specific measures are needed. In general terms, the physical or behavioral characteristic adopted for recognition and used at the time of the first registration in the system should be as similar as possible to those acquired at the time of the actual biometric transaction.

The technical obligation is realized, in practice, only in apparently simple actions. For example, it is a requirement, in biometric documents, that the facial expression assumed in the reference photographs and replicated at the time of the transaction should be as neutral as possible and therefore more easily reproduced. In this regard, there are already appropriate guidelines and explanatory tables, prepared by the organizations responsible for the standardization of data, to provide precise information on the facial expression to be assumed both during the stages of registration in the biometric system and that of authentication. In the light of emergent trends in technologically advanced countries, these instructions should also be extended to children, by

so doing they would be completely assimilated to the adult world. In addition, fingertips, whose exudate allows the collection of fingerprints, should not be damaged throughout life, for example by hand contact with corrosive acid. Similarly, if the biometric feature were the iris, in the case of cataract operations that would alter its morphology, the user who wants to safely preserve his 'biometricity' should re-register in the system due to the possible alteration of the morphological characteristics of the iris.

It is clear that the needs of recognition can have profound implications in the context of social life, by imposing new rules of conduct likely to take on deep bioethical implications. The idea is taking hold that, for reasons of security and certainty in relations, it is necessary to introduce a kind of duty for *permanence* and *maintenance* of the biometrics of the body that is unprecedented in cultural history and juridical experience (see section 4.4). The rules currently in force in the context of fundamental freedoms allow the individual adult and to some extent even minors to dispose at will of their appearance and not to worry particularly if their fingertips are altered or their face reshaped by plastic surgery. The alteration of the body is an atavistic manifestation of personal liberty on the basis of social, ethnic, religious or aesthetic trends or even just for fun. This applies both to non-permanent changes in appearance (cosmetic type changes, ornaments, etc.) and to permanent ones (tattoos, piercings, surgery, etc.).

In future, these habits may undergo a drastic reduction, even simply voluntarily, to avoid having to rebuild social identity whenever biometric credentials prove unreliable, as occurs with a worn or altered paper document. The way of appearing could therefore become the predominant way of being, the way in which each individual shapes their own unique image in relation to the deepest needs of their personality. Image, the symbol of personal identity, the personal instrument which each individual decides to proffer to the gaze of others and to communicate something of oneself to others, could turn into a pure constraint, the instrument by which the processes of identification are imposed.

It becomes obvious at this point, beyond the regulatory or coercive issues in general, that biometrics will however have profound psychosocial factors in the near future, including the possible feeling of uncertainty related to image and one's ability to be recognized by biometric systems.

3.2.2 Voluntary non-permanent changes

Voluntary non-permanent changes in appearance are generally the responsibility of biometrics based on facial recognition. In this category are placed all reversible changes ranging from cosmetics to the use of ornaments, up to the natural trichological change of the face.

Unfortunately, the effects of these changes as concerns the accuracy of face recognition are not completely known. What has been most studied is the problem posed by the use of glasses: for eyeglasses there would seem to be no particular difficulties as long as the lens does not cause a significant magnification of the periorbital area, the use of certain types of sunglasses can still be seriously harmful to the success of biometric transactions, even if some technologies, that reduce to zero the influence that they exert on the accuracy of biometric recognition, are in the advanced stages of testing.

3.2.3 Voluntary permanent changes

The increasing use of biometric technologies for investigative or judicial purposes is causing the growing problem of voluntary permanent alterations of one's biometric characteristics, both for aesthetic reasons and in order to deliberately avoid possible identification. To date, this phenomenon affects in particular the sector of biometric fingerprint recognition, as fingerprints can be intentionally damaged to the point of rendering a person totally unidentifiable. In general, this problem must also be assessed in order to prevent abuses and crimes could be perpetrated also on third parties (sometimes even on children).

3.2.4 The duty of conservation of biometric features

As occurs in current practice for traditional paper documents, if deteriorated, they may be rejected as an identification document, in the same way, in a future of ever more extensive biometric transactions, the damaging of one's biometric characteristics, such as atypically worn fingertips with the consequent difficulty in the issue of fingerprints, could have important effects in terms of recognition. In some cases, similar to what happens in the case of deteriorated documents a damaged biometric feature could lead to a refusal of the transaction by those responsible for control or by the system itself.

At this point, the limits of biometric technologies compared to traditional methods of recognition, should be rightly pointed out. While it is possible to reissue of an identity card similar to the deteriorated one and formally correct, in the case of biometric features, the physical element, once altered, may never be suitable again for recognition. This would create a sort of *biometric inability* for that physical feature.

3.2.5 Right to anonymity

Since biometrics works, by definition, through the attribution of identity or its verification, interference with the social systems of security is certainly likely. Preservation of the personal sphere as a fundamental intimate element implies the existence of a right to anonymity, or at least to exclusion of large spheres from the control of others. Confidentiality can not, however, justify an absolute right of non-interference each time someone is exposed to the public or adopts behavior that involves relations with other individuals. In other words, there is no absolute right to anonymity, which however, is guaranteed in many different circumstances. The cases in which it is desirable is the subject of discussion and moreover biometric technologies could reduce that freedom.

A clear example of the sensitivity of the subject can be supplied by the heated exchange of views in countries that are planning the construction of identity cards based on biometric identifiers. The process necessarily involves the development of national identity registers and some observers, as well as parts of public opinion see this as a serious attack on personal freedom and anonymity. The risk is further increased due to the potential application of the techniques of profiling that is spreading increasingly.

3.2.6 Discrimination of certain sections of the population

An important aspect of biometrics with clear ethical implications is given by the possible discrimination of certain groups of users. Of course, as well as the handicapped, for which the use of biometric technology is however in general terms, more complex and requires special measures, there is frequently open talk about *biometric disability* and namely about the difficulty or impossibility to use biometric technologies, encountered for certain categories of users.

It is known that, as with other phenomena related to human nature, including matters relating to biometric technologies, there is a window of time over which system performance is optimal. However, if biometric applications, as in the estimates of experts, become commonplace, they will affect people of all ages and it is already known, for example, that people from ages higher or lower than the "optimal" may experience some difficulties in using these technologies.

For example, if we refer to fingerprint recognition, biometric technology par excellence, the gradual drying of the skin combined with a thinning of the papillary ridges, phenomena related to age, causes an important loss of definition in the acquisition of fingerprints, to the point that some biometric programs for immigration fix a maximum age limit for the issue of fingerprints³⁹². Similarly, there are no clear indications on the temporal stability of the vascular characteristics underlying many new biometric technologies.

Any automatic equalization of the human body to a password does not consider with due attention the temporal transience of individual physical elements used for recognition. At present, there are no biometric technologies able to compensate, for biometric authentication purposes, for the inevitable changes caused by increasing age, changes that at times even make some of these technologies unusable (making appropriate the imposition of strict age limits for use). The analysis of the blood supply to some parts of the body, which is considered suitable for application without excessive age limits, is probably still too recent to be able to understand its real potential.

A futuristic alternative to such strict limits might be the use of variable thresholds of biometric systems according to the age of the user (in possession of an electronic card containing personal data). This approach, despite causing unavoidable increases in costs of design and operation of a biometric system, could allow the overcoming of rigid discrimination based on age, making older people feel more included in technological processes. Being excluded *tout-court*, could in fact increase their feeling that increasing age corresponds to a tragic loss of potential, even in terms of the use of innovative technologies.

The same applies to children³⁹³. For them, the use of biometrics raises a number of technical as well as ethical problems, and in particular for the fact that in this category of users body parts usable for the acquisition of biometric data are not yet fully formed or are still undergoing rapid development. One of

³⁹² A similar situation, the inherent limitation of the collection of fingerprints, also affects children, whose fingerprints are still undergoing fast and profound change. This could lead to substantial unreliability of the techniques and above all the need to continually update the template, with extremely high frequency.

³⁹³ In this case, it applies to a segment of the population that, in general terms, ranges from the age of 2 to 14-15.

the most delicate aspects is also represented by the almost total lack of specific studies.

While there is no denying the strong ethical value underlying biometric technologies as related to the fight against human trafficking, especially children, strongly influenced and limited by the use of these technologies, it is equally true that the use of biometrics for children should be defined in a context of strong caution for the possible psychological effects potentially related to the use of technologies that, at least at present, are perceived by the public as related to investigative and judicial aspects.

In fact, this characterization refers primarily to the use of fingerprints that over the years have actually proven to be of valuable support in public order operations. It is also true, however, that there are other biometric technologies which, having been developed in recent years, are characterized by less immediate psychological connections and perhaps should be preferred in applications aimed at children, for example access to school buildings, so as not to make them associate the biometric process to other procedures employed with a certain severity in different contexts.

Biometric facial recognition seems, at first, the most appropriate technology to use in the world of children even if, due to significant somatic changes even of the face, the so-called *currency* that represents the temporal parameter by which facial recognition has a good chance of success, is low and therefore measures are required, such as repeated enrollment in the biometric system.

Lastly, apart from the forms of exclusion linked to these new manifestations of *biometric disability* or inappropriate use of certain technologies for certain sections of the population; the use of instruments for detection, including biometric technologies, when applied only to a part of the population is to be condemned, if it jeopardizes the constitutional principle of equality.

4. Long-term scenarios

Producing forecasts on a larger and longer term scale, some experts argue that biometric technologies will represent only the tip of the iceberg as regards the thorough analysis to which users will be subjected. The information derived from biometric observation is in fact definitely higher in number and quality than those required for the single transaction with these technologies.

For example, as highlighted in section 3.2, through the single biometric recognition of certain physical features (e.g. face, retina or iris) a variety of information can be derived relating to the clinical picture of the user, and especially as to his psycho-emotional state, with all the potential risks of possible dissemination or improper use. Similarly, growing video surveillance in public places and simultaneous (hidden) biometric recognition could trace all movements of a person, as far as identifying their preferences in terms of purchases or the people they frequent.

Certainly, today's technological level, which is currently limited, and the irrelevancy of acquiring and retaining such a large quantity of information (an excess of facts are produced which can not be managed for any purpose) lead to the belief that there is no real danger of shady scenarios. However, it seems appropriate not only to take note of the indisputable merits related to individual

and collective security and more generally the quality of life of individuals. Instead, there should be an examination of the negative consequences of this pervasive and stubborn accumulation of data, which could affect the fundamental liberties and each individual's relationship with others and with his body, setting some limits in the use of biometric technologies that make their use more appropriate ethically and socially.

4.1 Preference for the use of technologies based on biometric features that leave no traces and for the exclusion of centralized repositories

As biometric technologies spread, it is easier to make a classification both, as we have seen, as regards the context of application that is most appropriate technically and in terms of possible social risks for users.

An interesting classification has been proposed by the *Commission Nationale de l'Informatique et des Libertés* (CNIL) in France, regarding biometric technologies that leave or do not leave traces. The CNIL refers to 'material' tracks, or the fact that the fingerprints, for example, are left everywhere on the objects we touch and therefore could be captured at a later time by anyone and, possibly used fraudulently. The spread of biometrics makes this a realistic possibility on a larger scale.

In principle, one can say that the risk, that biometric data obtained from physical traces left by an individual without his knowledge (e.g.: fingerprints) may be used for improper purposes, is potentially less if the data, instead of being stored in centralized repositories, remains with the same person through the use of electronic cards (Verification of Identity) without being accessible to third parties³⁹⁴.

A centralized repository of biometric data also increases the risk that such data be used to connect to other aggregates of personal data creating collectively a profiling of the subjects concerned. Biometrics could in this way act as a connecting element between heterogeneous information producing consistent information on the private lives of individuals and their habits in a variety of different fields. In this sense, different databases will be interoperable, while on the one hand it generates efficient systems and it can be an added value of biometrics as an enabling technology, on the other hand, it gives top interconnection of data with all the possible associated hazards³⁹⁵.

It is therefore clear that the use of technologies based on biometric features that leave no tracks, and that are based on the preference for systems with low impact archiving, and nonetheless, archives that are not interoperable, would solve some of the ethical and juridical issues related to biometrics, mitigating the potential mistrust of the users.

4.2 The right to oblivion

Memory is a key element of individual identity and social relations. It is difficult to imagine any internal development and cultural progress without the

³⁹⁴ EC - Working Group for the Protection of Persons concerning the Processing of Personal Data, Working document on biometrics, 12168/02/IT - WP 80, adopted on 1 August 2003.

³⁹⁵ Idem.

conservation and organization of traces of the past which may take many forms (memory, history, opinion, prejudice, etc.). Oblivion is just as important to make a selection within this set of elements, avoiding any unnecessary or harmful accumulation. To ensure social stability and protect the fundamental rights and freedoms of individuals, juridical experience has had to develop artificial forms of oblivion (despite their diversity: removal from criminal records, prescription, amnesty, pardon, etc.), where morality entrusts to forgiveness the extreme inner effort to overcome the past. From this point of view, biometrics does not present anything new: it merely offers a more intense, diligent and capillary collection of the amount of information. However, in order to be, at the same time, more systematic and fragmentary, more diligent and sporadic, biometric detection accentuates the possibility of interference in the lives of individuals. If economic developments and the right security requirements undermine any claim to guarantee an absolute right to anonymity, it becomes crucial to develop new and more complex forms of the right to oblivion. This is what currently happens with the biological material that is anonymized (that is linked to symbols or numeric codes to prevent being traced back, without authorization, to the identity of the person to whom they belong). By so doing, this ensures the confidentiality of all the information of the original referent, without preventing, in exceptional cases and under certain conditions, that identity can be traced (provided that the person has not requested irreversible anonymity). The same model should be followed for biometric detection, so to provide reliable and transparent processes of erasure or anonymity, and strongly reaffirm both the principle of exceptionality of the accumulation and crossing of information, particularly when information is acquired through non-cooperative and hidden instruments, and banishing vigorously any attempt to *function creep*.

Particular attention should be paid by individual legislators and international organizations, to make the right to oblivion effective, not only by providing fast and simple forms of its exercise, but by clearly placing the responsibility on whoever recorded the data, to obligatorily prove the necessity, proportionality and relevance of their collection. Memory, when it is entrusted to the schematics of *ubiquitous and autonomic computing*, can become a subtle and irreversible form of discrimination, being condemned to the impossibility of escaping the traces of one's past. For this reason, oblivion can not continue to be regarded as an exception, an individual or social concession linked to distressing moral choices or to particular situations. It must become an aspect of the fundamental right to personal identity, the right not to be filed, classified, and possibly irreversibly marginalized on the basis of information gathered without your knowledge through non-transparent criteria and for largely unknown purposes. The growth, in terms of efficiency and security, of biometric acquisitions should therefore be accompanied by a proportional increase in the possibilities of protection and hopefully in public awareness. If anonymity can not be expected, it is essential that at least the conditions for oblivion are guaranteed.

5. Summary and Recommendations

The widespread introduction of biometrics in civil life could in principle interfere with that degree of confidentiality that is currently recognized to the

person from the ethical and juridical tradition. Therefore, it is necessary that any such initiative should be adequately justified in terms of necessity and proportionality, accepted by public opinion and governed by the State, with proper assessment of the relationship between benefits and risks in the different sectors of peoples' public and private lives.

The NBC believes that the use of biometric systems for identification is extremely important to facilitate access and enjoyment of services, human relations, management of health, trade and financial transactions, and in general for purposes of facilitation. In particular, biometrics is crucial to improve safety, which in turn is a fundamental condition for the exercise of freedom and the achievement of individual personality. In addition to being safer and easier to use biometric systems could themselves be classified as technologies capable of increasing the spheres of confidentiality³⁹⁶, for example by avoiding having to provide any sensitive data that are now indispensable in the process of identification (eg.: date of birth, sex, nationality, marital status, home address, etc.).

These undeniable advantages do not prevent the indiscriminate use of biometrics, on the grounds that they create the material conditions that can enable various subjects to acquire, permanently connect and use, often in a covert manner and for a variety of purposes, a plurality of physical and behavioral data that could however determine consistent risks of discrimination, stigmatization and exclusion.

One form of such discrimination would occur for example each time these resources are used only against a part of the population in order to emphasize social control, but also to discourage inclusion in social life or to emphasize a "difference". Then there is the possibility of a particularly frustrating discrimination for individuals on the basis of system errors which can not be easily corrected, given the complexity and number of databases as well as the intersections between them. Stigma may be generated through the process of *profiling* creating, *a priori*, "suspect" profiles based on physical or behavioral characteristics by which certain persons may be prevented access to certain places or enjoyment of certain services. The phenomenon may be both public (e.g.: the fight against terrorism and organized crime) and private (e.g. the refusal of certain medical services to a certain group of subjects), and presents elements of special concern if it occurs in a hidden manner, perhaps linked to the use of distorted information acquired in excess of that go well beyond the purpose of immediate identification (*function-creep*, cf. section 3.1). Cases of exclusion could relate to certain categories of users (the elderly, children, and people with disabilities) that would become genuine *biometric disabled*, excluded from the use of certain services or access to particular places, or however forced to deal with even very expensive difficulties and obstacles.

Moreover, discrimination, stigmatization and seclusion would increase the risk that in psychological terms the subject becomes increasingly conscious of the body as something foreign, hostile, an enemy that belongs more to society, through the multiplicity of identification processes and the infinity of recorded and used tracks, than to himself and to the free explication of personality. All this would be even clearer and deeper should there be a duty for *permanence* of one's biometric data and *maintenance* regarding each of them.

³⁹⁶ PET (*Privacy Enhancing Technologies*).

In the light of possible inappropriate uses and potential risks of biometric technologies, the NBC recommends:

1. for the protection of the person:
 - a) that the introduction of biometric systems takes place continuously on the basis of the principles of necessity and proportionality;
 - b) that the application of prior informed consent should be guaranteed as far as possible to data collection and use, giving full information to its purpose;
 - c) that the use of technologies that involve a limited use of centralized and interoperable repositories should be encouraged;
 - d) that there should be recognition of the right to access of the person concerned to the biometric database regarding him, to know what data have been collected, by whom and for what purpose, since when and for how long, and with what other data this has been associated;
 - e) that there should be recognition of the right to oblivion considered an aspect of fundamental human rights, providing as far as possible reliable and transparent processes of cancellation or anonymity of biometric data, furthering in any case the idea of the exceptional accumulation of data and intersection of information, particularly when acquired through non-cooperative and hidden instruments.

2. for the organization and regulation of biometric applications:
 - f) that public and private legal entities or the authorities responsible for the collection of biometric data, and their purpose should be clearly identifiable;
 - g) that there should be established, in addition to the Authority for the protection of privacy and in close cooperation with it, a third body that controls whoever acquires biometric data, in what way and for what purpose, and how they are managed; or, alternatively, the NBC recommends the strengthening of the functions and responsibilities of the Authority for the protection of privacy, in order to address the combination of ethical and juridical profiles of biometrics;
 - h) that a framework measure should be developed and adopted, as was done for video surveillance, in order to regulate the use of biometric technologies and their management.

Lastly, the NBC hopes that intervention will be in force in all European and International countries to adopt domestic legislation prohibiting all forms of discriminatory application, preventing any use of biometrics that is unjustified or for purposes different to those proposed (function creep), incorporating the principles of *biometric disability*, and specifically the inability or difficulty to use biometric technologies that are sometimes found in certain categories of users.

Presidenza del Consiglio dei Ministri



**NEUROSCIENCE AND HUMAN EXPERIMENTATION:
BIOETHICAL PROBLEMS**

17th of December 2010

PRESENTATION

The advancement of neuroscience and neurotechnologies consents to carry out experiments on humans, of low invasivity, aimed at a better understanding of the functioning of the brain and its relationship with thought and behaviour. These experiments have made a significant contribution to the debate in the scientific and cognitive context, and spurred a renewed philosophical debate on free will and attracted the interest of the public.

The NBC - recognizes the importance of such research and studies that will enable a better understanding of the relationship between emotion and rationality in human decisions as well as the correlations between the areas of the brain/thoughts /actions – and highlights the problematic elements related to the reliability of results, the ability to extrapolate generalizations and the interpretation of results. In this sense the need to take a critical view of these experiments and calls for scientific communication - both by the investigators and the media – which is able to draw attention in a balanced way to the novelties and restrictions of applications, with particular attention to the dangers of neurological reductionism and determinism.

The NBC highlights the need for these tests to be submitted to the attention of ethics committees and to the ethical requirements of each trial (the risk-benefit assessment, and free and informed consent, preceded by appropriate counseling; the balance between protection of *privacy* and societal needs).

Finally, the Committee calls for amplification of interdisciplinary comparison and proper public debate – as reiterated also in European and international documents - to increase the understanding of citizens, and promote critical scientific information, that is objective and well founded.

The document addresses a specific topic within the large theme of 'neuroethics'. It was drawn up as part of a working group on the basis of a text prepared by Profs. Lorenzo d'Avack and Laura Palazzani. Profs. Salvatore Amato, Adriano Bompiani, Francesco D'Agostino, Antonio Da Re, Silvio Garattini, Marianna Gensabella, Laura Guidoni, Assunta Morresi and Andrea Nicolussi have contributed to the discussion and drafting of the final text.

The document was approved by a large majority, with the votes of Profs. Salvatore Amato, Luisella Battaglia, Adriano Bompiani, Stefano Canestrari, Cinzia Caporale, Francesco D'Agostino, Bruno Dallapiccola, Antonio Da Re, Lorenzo d'Avack, Riccardo Di Segni, Emma Fattorini, Romano Forleo, Anna Gensabella, Aldo Isidori, Assunta Morresi, Andrea Nicolussi, Laura Palazzani, Vittorio Possenti, Lucetta Scaraffia, Monica Toraldo di Francia, Giancarlo Umani Ronchi. Both Profs. Claudia Mancini and Demetrio Neri voted against. Prof. Grazia Zuffa abstained.

The President
Prof. Francesco Paolo Casavola

DOCUMENT

Premise

The considerable advances in neuroscience are increasingly subjected not only to the attention of bioethicists, but also to public opinion often in exaggerated and crude ways. Given the breadth of literature on these issues of a strongly specialistic nature but which are also of interest to the public and the speed with which the theoretical framework changes, the NBC limits itself, at present, to offering some preliminary observations on the relationship between human experimentation and bioethical issues, reserving the right to return to other issues, already partly discussed successively in the working group, (empowerment, posthuman, robotics, criminal law etc.). This document is in line with other NBC documents on the subject of human experimentation³⁹⁷.

1. Introduction

1.1. Advancement of neuroscience and neurotechnologies

The advancement of knowledge in anatomy and microanatomy of the nervous system and neurobiology together with technical advances in the development of methodologies and tools for the study of human brain (the so-called imaging techniques or neuroimaging) have allowed a rapid expansion of neuroscience research in relation to the diagnostic and therapeutic potential provided for the understanding of diseases. Research and results in this sector have attracted great interest also in the field of philosophy and bioethics, giving rise to wide reflection and discussion referred to as 'neuroethics'³⁹⁸.

Until a few decades ago, knowledge of brain function was limited because it was based on neurophysiological experimental techniques applied to animals (non-human primates and other mammals) - with significant bioethical issues due as to their extreme invasiveness³⁹⁹ - by inserting electrodes into the cortex and recording of neurological functions in the execution of certain perceptual, motor or cognitive tasks. To this method there has been added the study of lesions induced on a particular area of the brain and analysis of the resulting behavioral deficits.

The transfer to humans of knowledge obtained from animal models can only be partial: it can not cover the more complex functions such as language, which characterize the human brain.

A more careful study of human complex cognitive functions (the field of neuropsychology and cognitive science) has been possible through the knowledge acquired by direct electrical stimulation of the cerebral cortex during

³⁹⁷ *The improper use of placebo*, 2010; *Secrecy in drug regulatory system procedures*, 2010; *Bioethical problems in clinical trials with non-inferiority design*, 2009; *Pharmacological trials on women*, 2008; *Drug experimentation*, 1992.

³⁹⁸ It should be distinguished from 'applied neuroethics', which deals with ethical, social and juridical issues that may arise when the findings about the brain are reflected and used in clinical practice, social policy and law, from 'philosophical neuroethics' regarding the philosophical and anthropological reflections of those lines of research aimed at investigating the neural bases of moral behavior.

³⁹⁹ See an earlier NBC document *Alternative methods, ethics Committees and conscientious objection to animal testing* 18th December 2009.

neurosurgical operations and the anatomo-clinical correlative method between the site of the lesion and resulting cognitive deficits. The introduction of methods of radiological study of the structure of the brain in vivo has since allowed more precise localization of the damaged site, which has pushed forward - indirectly – also the study of mental and psychological activity. Despite these radiological developments, the neurological study of the human brain needed adequate means of "visualization" of brain activity in vivo, capable of measuring brain activity in healthy individuals during performance of various tasks.

To facilitate these advances have been the combined achievements in the basic knowledge of cellular activities and the neural network (neurobiology) and development of imaging techniques applied to the study of human brain activity. While on the one hand some of these techniques have allowed the definition of disease with identification of damage in specific brain areas, on the other hand the development of specific methods using complex mathematical and physical tools, now allows study of the mechanisms of connection between neurons and the location of areas dedicated to specific functions. Both are of particular importance: the study of signal propagation and the connections between neurons (biological neural networks).

1.2. Experiments and studies

The availability of many new complex morphological and functional technologies with which to better recognize some brain circuits, characterized by low invasiveness, allows to perform experiments on humans aimed at a better understanding of the functioning of the human brain and its relationship with cognitive functions and normal and pathological behavioural aspects. The development of this kind of knowledge on healthy individuals, which is one of the goals of neuroscience today - as evidenced by the proliferation of contributions to psycho-neuro-biology magazines - is the aspect that may be more critical in terms of bioethics, while the development of knowledge with therapeutic or diagnostic purposes is part of the longer-established clinical trial.

In general, the experiments in question use a variety of modern technologies (see Appendix) that are intended to describe and / or measure the behaviour of individuals or groups of neurons in a given brain area or the relationship between two or more brain areas. This research is aimed to investigate in healthy or sick individuals, for example whether certain choices of behavior are the result of immediate automatic reactions or mediated/rational responses, as well as the relationships between emotional responses or cognitive capacity and stimulation induced by the environment. The experiments may involve the identification of brain areas involved in the dynamics of development of a decision or a moral judgement or changes in the brain induced by the experience of moral pain, forgiveness, and altruism. Also important is the research on changes in the brain in relation to violent or antisocial conduct and in relation to the capacity of discernment or the ability to distinguish between the assertion of truth and falsehood. Particularly relevant are the studies that aim to characterize the activity of specific brain areas in individuals unable to interact with other people or the environment, such as those in a vegetative state or minimally conscious. These and other issues can

be studied in relation to variables such as gender difference, socio-cultural diversity as well as different psychological profiles.

1.3. Problematics of research

Even though such experiments and research on the brain/thought/behaviour relationship have made a significant contribution to the resultant research and debate in scientific and cognitive fields, have prompted a renewed philosophical debate on ancient questions (such as the 'brain-body and mind-body' relationship or the subject of freedom and free will) and have attracted interest from the public, in scientific terms, many perplexities have been put forward.

Experimental research generally takes place under very 'controlled' conditions, creating problematic elements in terms of their repeatability. These assume greater importance in neuroscience, for various reasons. Among these:

a) the choice of subjects is predetermined by criteria, which in itself can affect the outcome of the experiment and are not necessarily representative of the population;

b) subjects involved in a study often do not act spontaneously, but are instructed to collaborate with the experimental method (often the large number of tests required can transform voluntary movement into automatism rendering the study unreliable);

c) learning of the experimental details can cause anxiety that can interfere with results;

d) the representativeness of the sample is often insufficient to achieve adequate statistical analysis;

e) individuals think and act in 'artificial' situations far removed from reality;

f) the studies refer to the actual subjects however the conclusions of the studies are generalizations that do not consider/can not consider with precision individual variability (because of the plasticity of the brain, different environmental influences) and the variability of the same individual over time.

From these sample data one understands - although it does not detract from the importance of individual experiments - the difficulty of extrapolation and generalization, since the current phase of the research is still at a descriptive level: the results are still uncertain, and only in time can they be further validated by a more adequate scientific maturity. Therefore, the possibility of generalizing experimental data should be defined from time to time, drawing attention to the limits of application to reality. The constant exercise of critical spirit must still be accompanied by an attitude of openness with respect to these experiments, without the fear that may change acquired convictions.

In addition to the problematic nature of the experiments, the problematics related more specifically to the interpretation of results should also be noted, with particular reference to the 'correlation' between areas of the brain, thoughts and actions/performance of man's duties. One must distinguish different meanings of 'correlation': correlation as exclusively deterministic causation, according to which there is a single, total and predetermined cause of one event or more causes that are necessary and sufficient for the same event (unique cause/effect relationship); correlation as a multifactorial causation, which admits the possibility that an event-effect may have multiple

causes, i.e. causes of various kinds (physical and non-physical). Within this latter sense it is possible to highlight relationships that are more or less statistically significant between the various causes and effects, never established a priori but only associated a posteriori.

The fact that a particular brain region, as evidenced by *neuroimaging*, is activated with particular intensity during the formulation of a thought or performance of a specific task, does not infer with certainty that this is the only region involved or the only one responsible. The correlation, even when identified with a sufficient degree of significance, does not imply a deterministic causation. Functional *neuroimaging* data do not allow us to say whether the activation of an area is an epiphenomenon or is necessary for the elaboration of a thought or determines in a causal sense the performance of a task. This means that the visualization of brain areas and the identification of 'neural correlates' of certain mental states or actions do not allow to 'read minds' (to know whether a person is telling the truth or a lie) or to 'predict certain behaviours' (automatically linking intentional or unintentional behaviours), but rather only to predict them with a level of approximation that is not accurate. In this sense, the knowledge acquired and possible to be gained through new neurotechnological applications can not be used as 'certain data'.

The failure or malfunction of an important region of the brain decreases or may even completely prevent the corresponding function (e.g. language). In the case of neurological detection of 'defects in the instrument' (i.e. dysfunction of a region of the brain responsible for an important function) it is possible to attribute to the decreased or missing functionality of the region the impairment of the tasks assigned to it and possible consequential abnormal behaviour (or lack of behaviour). In this sense, functional brain imaging techniques, which are being introduced by courts, can lead to the request to recognize a reduced capacity to understand or want.

2. Bioethical problems

a) The reported studies (some of the most important and well-known) show how technological advancement have made it possible to greatly expand the research fields of neuroscience and to address issues of increasing complexity, in order to delineate new 'discipline' areas, such as for example, social neuroscience, within which the so-called 'Neuroeconomics' is becoming especially important. New *neuroimaging* techniques have led to an explosion of studies in the field of cognitive and psycho-social neuroscience⁴⁰⁰. In addition, the ease of reading and spectacular images have prompted a wider dissemination of the results of such research to a non-specialist public.

The application of neurotechnologies in these studies and research can stir up, due to the results and the information it provides, inevitable concerns with psychological consequences on the subject and family members. All this implies a necessary assessment of the reasons and purposes for such experiments.

⁴⁰⁰ New perspectives could open, for example, in relation to functional magnetic resonance experiments that are proposed to probe brain activity, with particular attention to the possibility of communication in people with severe disorders of consciousness (e.g. those in a vegetative state, minimal conscience, *locked in*).

The ethical criteria of trials should also be applied in this area and approval of experiments should be given obligatorily within the scope of ethical committees. The *Additional Protocol to the Convention on Human Rights and Biomedicine, Concerning Biomedical Research* (2005) and, in particular, the *Explanatory Report* on the extension of biomedical research in all areas of intervention on human beings, not only in the biological sense but also psychologically, should be recalled⁴⁰¹. The approval of experiments should be given provided that there is compliance with the precise and predetermined 'protocols' that bind researchers to respect certain limits⁴⁰²:

- the risk-benefit assessment with reference to the expected objectives, 'risks' are not to be understood only in a physical sense but also psychosocially and 'benefits' can also mean it in a non direct and real sense (within the context of non-therapeutic research);
- free and informed consent - preceded by appropriate counselling - of those who undergo such investigations of the subject or guardian (with specific attention to those who are in a position of person and institutional vulnerability or relationship of dependency).
- the use of results, the balancing of the protection of *privacy* with the needs of society.

b) Even within the context of acquired data through these studies and research two types of problems arise.

1. First and foremost, the need for cognizant authorization by the subject regarding the use of information concerning him. Some applications of neuroscience, which lead to "the reading of the brain" bring into question confidentiality, also called 'brain *privacy*'. Consider the possibility that examination of the brain, originally aimed at obtaining certain information, ends up to providing other information that can be used to the detriment of the subject of the clinical trial (so-called *incidental findings*) or nevertheless prove risky in emotional or psychological terms. These are similar problems to those presented in the context of genetic testing.

There is also the ethical and juridical problem of the existence or nonexistence of an obligation to communicate the results to third persons, should they have an objective medical and social interest in the information. This is a question, once again, of the balancing of the individual right to *privacy* with other fundamental rights such as life and the health of other people who may be in jeopardy. In particular the right to confidentiality of "neurological information" may be outweighed by the need to protect the safety of family members with whom the person is in daily contact. Of course, this balancing can not be reduced to simply informing these third parties of the data, but information (as mentioned above) must be accompanied by proper counselling as to the meaning of the data, the psychological difficulties of the person - such

⁴⁰¹ Art. 2 (field of application): "for the purposes of this Protocol the term intervention include: 1. physical intervention, and 2. any other intervention in so far as this involves a risk to the mental health of the person concerned." The protocol stresses that any experiment on humans concerning his health, including mental, he must be approved by an ethics Committee at the outset.

⁴⁰² The NBC has expressed its opinion on these issues in the documents: *Experimentation of new drugs* (17th November 1992); *Information and consent related to medical acts*, (20th June 1992).

as the obvious fears of abandonment or discrimination - which may have prevented a spontaneous communication to family members, and any measures to be taken, so that the information does not result in a mere shifting of responsibility, but into a tool to eliminate and reduce risks in general and, where possible and advisable to adapt family life to the new knowledge arising from knowledge of the information.

2. Another aspect of concern regarding the use of research results is constituted, in a general sense, by the impact of neuroscience on some traditional categories of philosophical thought that, today, can be investigated, at least in part, starting from the functions of the brain. There emerge, from these studies, 'theoretical and practical problems' that have/may have, especially in the medium and long term, a certain effect on the basic categories, behavioral models and practices, developed by social sciences and natural sciences.

Many of the findings of neuroscience link neuronal activity with thought and behaviour, producing new philosophical models for the understanding of man. Based on empirical evidence, there is a conceptual paradigm towards neurobiological reductionism and determinism. It is similar to what has already happened in genetic research, where reductionism and genetic determinism (the idea that human identity is reduced to the sum of genes and human behaviour explicable on the basis of genetic predisposition) have overshadowed other factors of a personal nature, as well as social-cultural-environmental nature that exert a key role in the genesis of states/mental dispositions and of behaviour. Therefore, on a philosophical level, there is in progress, a considerable debate on the 'compatibility/incompatibility' between new neurological data and subjective freedom/responsibility. It is a fundamental point that requires discussion, the NBC believes it essential that this be achieved in an interdisciplinary manner.

Regarding the implications of new neurological findings on the law and specifically on the cogency of legal rules, it must be said that the principle that the person in a mentally unsound state is not liable for illegal acts - precisely because he does not know or can not want – it has long been a part of our legal order as indeed in most of those of the West. It is a matter of comprehending whether the new diagnostic tools and neurologic assessment are recognized as reliable or not, according to the principle of eligibility/non eligibility of the incapable person. There have been multiple reflections and uses of neuroscience in the legal field in general and in particular in criminal law (eligibility of the subject in relation to free will; value of testimony, polygraph, sense of justice, etc.)⁴⁰³. The assumption is confirmed that the purpose of the law is to influence behaviour and educate, the users of legislation can not be separated from their ability to understand and use the rules as premises to guide their choices.

⁴⁰³ In Italy cf. Judgement of the Court of Assizes of Appeal of Trieste on 18 September 2009. In the U.S., cf. the case *Perry v. Lynaugh* 1989, commented by A.Ş. Barth, *A double edged sword: the role of neuroimaging in federal capital sentencing*, in the "American Journal of Law and Medicine", 2007, vol. 33, No 2-3. For the purposes of the adjustment process to the scientific principles of criminal law decision, see also *Kumho Tire Co. et al. V. Carmichall et al.*, 1999, commented in L. De Caldato Neuburg, *Neuroscienze e diritto penale. La scienza come, quando e perche'*, in "Neuroscience and the Law", edited by A. Santosuosso, Pavia 2009, p. 148 ff.

Recommendations

In the light of these emergent problems, the NBC makes the following recommendations.

1. Some studies in the field of neuroscience and neurotechnology could permit further knowledge and comprehension of the causes of human behavior giving the possibility to change and enrich the meaning of ethical, social and juridical responsibility. Neurotechnology can represent an interesting opportunity to give new contributions to the bioethical debate on the relationship between rationality and irrationality, between rationality and the emotional-sentimental dimension, as well as understanding of the ways in which decisions are made.

2. It is however fundamental to emphasize the importance of adopting a critical attitude as regards the results of these experiments which are often proposed to public opinion without adequate reflection as to the highlighting not only of the novelties, but at the same time also of the limits. The NBC makes reference to the responsibility of investigators and doctors and that of the media, which often emphasize uncritically acquired results, and calls for caution in communication of scientific data to the public, distinguishing correlation from the simple cause-effect relationship. Validation of the technologies used and constant revision of the hypotheses emerging from the results of experiments is required in order to avoid forms of discrimination in the social context. The call for caution is compulsory in the relationship between neuroscience and law, with particular reference to the assessment of accountability and reliability of testimony in court.

3. Considering the discovery of brain areas associated with the development of impulsive and violent conduct, it should be recognized that neuroscience can help to discover brain dysfunction that hinder the fulfillment of certain functions or that favour disturbed effects, in order to be able to suggest some treatments. Some scholars, for example, believe possible the early detection of those at risk and establish judgements of eligibility/non-eligibility on the basis of these criteria. Notwithstanding the problematic nature of these categories, in addition it is important, in theory, to draw attention to the fact that the neurological knowledge gained and acquirable through new technologies – despite the increase in our knowledge - can not constitute as such 'brain correspondence' of 'truth, freedom and responsibility', because such qualities are typical to 'people' and not to the 'brain'. The NBC intends to warn against a highly reductionist approach.

4. The studies and research in the neurological sector must still comply with the requirements of ethics inherent in any testing on human subjects, found in risk-benefit assessment, in informed consent and the authorization of the use of results, balancing the protection of '*privacy*' with the requirements of advances in knowledge and societal needs. A particularly important role is played by ethics committees that will have to acquire specific expertise in neuroscience. It is hoped that the scientific community will formulate codes of conduct, in order to ensure the growth of awareness and shared ethical behaviour.

5. The NBC calls for greater interdisciplinary comparison of the human sciences, especially philosophy as well as adequate and effective public debate – as is also repeatedly reiterated in the European and International documents aimed at national governments – for the promotion of knowledge

and the issues raised by the new developments in neuroscience in order to increase the understanding of citizens and further critical scientific information, that is objective and well founded.

Appendix - Neurotechnologies

Over the past thirty years, the advancement of methods of recording electrophysiological signals and the advent of new functional *neuroimaging* techniques have greatly expanded the possibilities for the study of complex cognitive functions. These include:

- electroencephalographic techniques (EEG) that directly record the electrical activity of the brain through electrodes placed on the scalp of the subject;
- the technique of the event-related potential (ERP) records with high temporal resolution the electrical activity related to the performing of specific perceptual, motor or cognitive tasks;
- magnetoencephalography (MEG) records the magnetic field associated with the electrical activity of neurons;
- magnetic resonance imaging (MRI) uses radio frequencies in the presence of magnetic fields;
- magnetic resonance spectroscopy (MRS) can detect changes in the metabolism of certain brain areas, for example in relation to the loss of neuronal function, recognizing the individual chemical compounds associated with the function / dysfunction;
- the *brain-computer interface* consents the reading of electroencephalographic signals, their correlation with the intentions of the subject and the translation of this correlation in commands for action;
- positron emission tomography (PET) allows the construction of a three-dimensional map of brain activity using the distribution of a radioisotope (e.g. in glucose), which is distributed in the brain areas that are activated in relation to a stimulus or also an emotional solicitation;
- functional magnetic resonance imaging (fMRI) allows the construction of a three-dimensional map, locating the areas activated by stimuli; generally contrast is provided by the call of blood flow in brain areas activated by a technique called BOLD (blood oxygenation level dependent); other approaches include the use of non-radioactive contrast agents;
- transcranial magnetic stimulation (TMS) consists in the application on the scalp of magnetic fields with certain parameters of intensity and frequency and permits to determine the behavioral effects of stimulation;
- the *brain fingerprint* measures brain waves when a piece of information is found lodged in the brain;
- the *multifaceted electroencephalographic response analysis* (MERA) measures brain waves that are formed in response to a sequence of words or figures/meaningful images that move rapidly on a monitor.



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Capo del Dipartimento

Elisa Grande



Presidenza del Consiglio dei Ministri
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