

Report of the Madrid Consultation

Part 1: European and Universal Challenges in Organ Donation and Transplantation, Searching for Global Solutions

Introduction

During the past 50 years, the transplantation of human organs, tissues, and cells has become a worldwide practice that has extended and greatly enhanced the quality of hundreds of thousands of lives. Transplantation is the best and most cost-effective treatment for end-stage kidney failure and remains the only available treatment for persons with end-stage failure of other solid organs. Continuous improvements in medical technology, particularly with respect to organ and tissue rejection, have led to increased demand for organs and tissues. Despite substantial expansion in organ donation from deceased persons in recent years and greater reliance on donation from living persons, the availability of organs and tissues for transplantation remains insufficient to meet demand.

Global activities in organ donation and transplantation are highly variable, resulting in gross inequities in access to transplantation therapies. Where transplantation services are available, the great shortage of available organs in most jurisdictions means that many people in need are excluded from waiting lists, others deteriorate or die while awaiting transplantation, and some turn to desperate alternatives such as organ sales and transplant tourism. These unethical practices are addressed in The Declaration of Istanbul on Organ Trafficking and Transplant Tourism and in the WHO Guiding Principles for Human Cell, Tissue and Organ Transplantation (1, 2). For the governments of most high-income countries, the consequence of organ shortages has been a vast and escalating expenditure on kidney dialysis, despite dialysis therapy being more costly and associated with poorer outcomes than kidney transplan-

tation. Given the manifest harms of transplant commercialization, global disparities in access to transplantation, the growing demand for organs, and the enormity of costs associated with dialysis provision, there is an urgent need for new strategic approaches toward these challenges that are capable of equitably meeting the organ transplant needs of populations in reliable, sustainable, efficient, and effective ways that do not compromise ethical principles.

The Third WHO Global Consultation on Organ Donation and Transplantation (Madrid, March 23–25, 2010) brought together 140 representatives of international scientific and medical bodies, government officials, and ethicists, with the goal of confronting these shared challenges and developing a comprehensive strategic response (the Madrid Resolution). The theme of the conference, “Striving to Achieve Self-Sufficiency,” refers to the practical and ethical requirement for jurisdictions, countries, and regions to take action to both reduce transplantation needs and optimize the resources available to meet them. The many facets—both practical and policy based—of the pursuit of self-sufficiency were the focus of working group discussions. Broad representation from different countries, clinical backgrounds, and disciplines enabled a holistic appreciation of the issues.

Each working group produced detailed recommendations that are reproduced in full in *Part II* of this report. *Part I* presents a comprehensive background to these recommendations, being an account of the proceedings and plenary presentations of the Consultation. Proceedings were in four main parts: (1) a Round Table of European Ministries of Health to discuss the benefits of a common European strategy toward organ donation and transplantation; (2) a presentation of current chal-

From the Declaration of Istanbul on Organ Trafficking and Transplant Tourism:

Principles

- ...Jurisdictions, countries, and regions should strive to achieve self-sufficiency in organ donation by providing a sufficient number of organs for residents in need from within the country or through regional cooperation.*
- a. Collaborations between countries is not inconsistent with national self-sufficiency as long as the collaboration protects the vulnerable, promotes equality between donor and recipient populations, and does not violate these principles.*
- b. Treatment of patients from outside the country or jurisdiction is only acceptable if it does not undermine a country's ability to provide transplant services for its own population.*

Proposals

- ...Governments, in collaboration with health-care institutions, professionals, and non-governmental organizations, should take appropriate actions to increase deceased organ donation. Measures should be taken to remove obstacles and disincentives to deceased organ donation.*
- In countries without established deceased organ donation or transplantation, national legislation should be enacted that would initiate deceased organ donation and create transplantation infrastructure, so as to fulfill each country's deceased donor potential. In all countries in which deceased organ donation has been initiated, the therapeutic potential of deceased organ donation and transplantation should be maximized.*
- Countries with well-established deceased donor transplant programmes are encouraged to share information, expertise, and technology with countries seeking to improve their organ donation efforts...*

lenges and initiatives in organ donation and transplantation in the EU, including a presentation of the European legislative framework on quality and safety aspects of organ donation and transplantation (The Directive on Quality and Safety Standards of Human Organs Intended for Transplantation) and its associated Action Plan; (3) introduction of the concept of self-sufficiency in organ donation and transplantation and discussion of its role within the agenda of the WHO, followed by an examination of the responsibilities of health authorities and professional societies in furthering the pursuit of self-sufficiency; and (4) a global overview of the current state of affairs in organ donation and transplantation, with representation from each of the six WHO regions.

In the context of organ donation and transplantation, "self-sufficiency" refers to the adequate and equitable provision of transplantation services and human organs to satisfy the organ transplantation needs of a given population, using resources obtained from within that population or provided through regional cooperation. There was extended discussion during the Madrid Consultation regarding the ability of the term self-sufficiency to adequately capture the full implications of what is involved in satisfying the organ transplantation needs of populations. In particular, there was concern that the important role of ethical and regulated regional or international cooperation in some jurisdictions, and the globally collaborative nature of the pursuit of self-sufficiency, would not be satisfactorily conveyed in the subsequent use of the term.

In the weeks and months after the Madrid Consultation, it became evident that self-sufficiency appropriately encapsulates the conception of donation and transplantation that we intended to promote. Scientific and professional societies include self-sufficiency in the agenda of their congresses, and representatives of MS used it during the last WHA. The term functions as intended; striving toward self-sufficiency is a rallying standard for a new paradigm in the conception of organ donation and transplantation that:

- Is applicable at jurisdictional level, where the authority and power of health policy implementation lies, and where agreements between small countries with respect to regional cooperation are made;
- Is inclusive of all those in need of transplantation, and also places the burden of donation on all, whenever medically and ethically possible;
- Promotes societal values and community ethical principles;
- Promotes integrated end-stage organ failure management, from public health education and primary prevention to organ replacement therapies;
- Has relevance to low- and middle-income countries by emphasizing that successful implementation of efficient and effective interventions are possible in all contexts without an unjustifiable distortion of existing public health priorities;
- Prioritizes the development of donation from deceased persons.

Reluctance to invoke the pursuit of self-sufficiency may also be due to a fear of creating impossible hope in promoting the goal of meeting all needs for transplantation. However, although the achievement of self-sufficiency may currently be a remote goal in many societies, in others, there is evidence of

rapid and substantial progress. For example, in Norway, 70% of patients with end-stage kidney disease receive a kidney transplant as their first line of treatment (<http://www.nephro.no/nnr/AARSM2008.pdf>). Regardless of the current challenges facing the pursuit of self-sufficiency in some countries, the ultimate goal remains both desirable and relevant to those suffering organ failure throughout the world and will inspire efforts that strive ever closer to its achievement.

The optimization of donation after death constitutes the foundation of the pursuit of self-sufficiency. The potential of patients who die with viable and functional organs at the time of death is sufficient to meet all transplant needs—if only all opportunities for donation could be enabled. Crucially, all societies must begin by engaging as early as possible with the concept of death in the context of respective social, religious, and cultural values and customs, so that public discussion and education can address concerns and promote the development of responsible policies concerning donation after death. To maximize the therapeutic potential of donation from deceased persons, such policies must recognize donation after death as ethically proper, including the recovery of organs from both those who have died as determined by neurologic criteria (DBD) and after the irreversible cessation of circulation and respiration (DCD). Although DCD is currently not performed in all jurisdictions, it is ethically proper as the dead donor rule that organ recovery is not the cause of death is affirmed by this donation pathway.

In the face of divisive market forces that invoke urgent needs for transplantation as an imperative to legitimize organ sales, the global community must take action and promote a greater level of community involvement in transplantation and donation activities. The tragic phenomenon of transplant tourism should be replaced by a united global effort to reframe the human experience of death as a potential opportunity to participate in a vital communal endeavor that saves lives.

Some countries already demonstrate significant progress toward self-sufficiency. The success of the Spanish Model of Organ Donation in achieving 20 years of sustained increases in rates of organ donation is internationally recognized, and Spain already has a comprehensive strategic plan to further increase organ donation after death to a rate of 40 donors per million population (3). Elsewhere, transplantation laws prohibiting organ sales are being introduced, reflecting a growing political resolve to end the practices of organ trafficking and transplant tourism. The Madrid Resolution is a significant step toward a universal approach to organ donation and transplantation and an international commitment to the pursuit of self-sufficiency. Significantly, the Madrid Resolution also offers a roadmap of the way forward that has relevance in all contexts and can be adapted to local realities.

OFFICIAL OPENING

Trinidad Jiménez García-Herrera, Minister of Health and Social Policy, Spain welcomes the attendees to the Madrid Conference on Organ Donation and Transplantation and gives the floor to participants for the official opening.

Isabel de la Mata, Public Health Advisor, European Commission recalls the previous Spanish Presidency of the EU, during

which a Conference on Tissues and Cells was held. Discussions began laying the groundwork for the development of the Directive and its subsequent approval. The debate about the Directive on Quality and Safety Standards of Human Organs Intended for Transplantation and the Action Plan started back in 2008, thanks to the efforts of the European Commission and the MS. The Commission intends to find a balance between the requirements for quality and safety of organs, tissues, and cells, and recognition of the different organizational approaches in place in the EU. The Spanish Presidency will exert maximum efforts to get a first-reading agreement on this Directive in June 2010, and to see the maximum benefits for patients derived from this political initiative, along with the Action Plan.

Steffen Groth, *Director Essential, Health Technologies, WHO* refers to the 57th World Health Assembly Resolution on Human Organ and Tissue Transplantation. As a consequence of this Resolution, many countries have condemned the commercialization of the human body and organ trafficking. This trade is inconsistent with the most basic human values and contravenes the Universal Declaration of Human Rights and the spirit of the WHO Constitution. Although consensus is being built regarding the ethical principles guiding organ donation and transplantation, the insufficient number of organs available to meet transplantation needs remains a challenge. Self-sufficiency in transplantation is to be understood as a community responsibility. Every person could be a potential organ recipient, so every person should recognize him or herself as a potential organ donor after death. The WHO aim for this conference is making the concept of self-sufficiency possible.

Jeremy R. Chapman, *President of TTS* thanks the Spanish Ministry of Health, the European Commission, the WHO, and **Dr. Francis Delmonico** from TTS for making this Conference possible and for their dedication, which are making donation and transplantation progress and bringing immense benefits for patients.

Jo Leinen, *Chair of the Committee on the Environment, Public Health and Food Safety, European Parliament* stresses the timeliness of the Conference, because the EU is immersed in debate concerning the Directive on Quality and Safety Standards of Human Organs Intended for Transplantation. There are wide variations between MS in rates of donation after death, and the shortage of organs is a major factor affecting transplantation programmes. The Committee of Environment, Public Health, and Food Safety of the European Parliament has just voted on two reports concerning the Directive, and the Action Plan, the latter aiming to achieve a better cooperation between MS in the field. The Directive includes the principle of voluntary, unpaid donation and specifies measures for the protection of the living donor, issues of paramount importance for the Parliament. Given the need to match donors with recipients, the relevance of cross-border exchange of organs is also to be emphasized.

Spain is a good example of success in significantly increasing the number of deceased organ donors. It has been proven that such increase is linked to the introduction of certain organizational measures that enable the system to identify potential donors and maximize their conversion into actual donors. The role of public awareness and opinion in

increasing organ donation rates should also be recognized. It is to be expected that this Conference brings us a step further toward an efficient, high-quality, organ donation and transplantation scheme for the whole EU.

Round Table Ministries of Health

Country Benefits of a Common European Strategy

Trinidad Jiménez García-Herrera, *Minister of Health and Social Policy, Spain* presents participants to this round table.

Ana María Teodoro Jorge, *Minister of Health, Portugal* expresses the deep support of Portugal for a common European strategy. Portugal has evolved from 19 donors per million population in 1996, to 31 donors per million population in 2009. This improvement has been possible because of several different actions, including the introduction of transplant coordinators in ICUs and the training of professionals in donation and transplantation. In this regard, the work carried out by the University of Barcelona and its Transplant Procurement Management Course is to be acknowledged, another example of the close cooperation between Spain and Portugal in the field of donation and transplantation over recent years. Transplantation saves lives and improves the quality of life of patients, but the shortage of organs within the EU is a reality, and efforts are to be made for the pursuit of this new concept of self-sufficiency. In this regard, instruments for the promotion of international cooperation are necessary, including those which allow an active exchange of organs between countries, while preserving the quality and safety of the organs transplanted.

Annette Widmann-Mauz, *State Parliament Secretary, Germany* stresses the fact that the number of patients on the waiting list for a transplant far exceeds the number of donors. MS must work together to increase donation; hence, cooperation between MS is necessary. The Directive on Quality and Safety Standards of Human Organs Intended for Transplantation of the European Parliament and of the Council foresees the establishment of a network of MS competent authorities and sets down the importance of organ exchange between countries, as actively performed by European organizations, in particular Eurotransplant or Scandiatransplant. The Directive also includes provisions to ensure a uniform level of quality and safety of organs. At the same time, the Directive provides flexibility to MS with regards to the details of transposition to national legislation. Germany is supportive of this Directive and particularly emphasizes the importance of two articles: #13, relating to the voluntary and unpaid nature of donation, two basic principles which also help to guarantee the safety and quality of organs and #15, regulating the protection of the living donors. The Directive will bring undisputed advantages for EU countries and immense benefits for their patients.

Melinda Medgyaszai, *State Secretary, Hungary* underlines the danger of organ trafficking and the importance of both initiatives, the Directive and the Action Plan, in contributing to the prevention of trafficking related to transplantation. The need to increase organ availability is also essential, while respecting the quality and safety standards of organs for transplantation, as provided for within the Directive. In this regard, the importance of everyone's solidarity is to be underlined.

Trinidad Jiménez García-Herrera Spanish Minister of Health and Social Policy

"Ministers, Parliamentarians, and Health Authorities from different countries from the five continents who have come to this Conference, from WHO, from the EU and from the Council of Europe, transplant professionals, coordinators and directors of the different transplantation organizations, members of TTS, dear friends from Latin America participants to the 6th Edition of the MASTER ALIANZA, members of the patients' associations, dear friends all:

It is a pleasure for me to welcome you to this MADRID CONFERENCE ON ORGAN DONATION AND TRANSPLANTATION, organized by the Spanish Presidency of the EU and assembling relevant personalities from health-care administrations and the field of organ donation and transplantation from the five continents, which will make Madrid be considered the WORLD CAPITAL OF TRANSPLANTATION during the next three days.

The main objective for today's meeting is very clear: to foster a decisive collaborative strategy on donation and transplantation among the MS of the EU, which should lead us to build the biggest structure of the world in this field, covering 500 million people with the highest standards of quality on one hand, and the highest quantity on the other in terms of access to these therapies on which so many lives depend.

With this purpose, already announced at the end of 2008, two initiatives of the European Commission are on the table for which the Spanish Presidency is giving maximum support. Above all, the support provided to the project of a European Directive on standards of quality and safety of human organs intended for transplantation is to be highlighted. The process is well advanced at the Council as well as at the Parliament and we are sincerely hoping a first-reading agreement.

As a perfect complement to the Directive, the Action Plan intends to promote cooperation on organ donation and transplantation among all MS. One single example can exemplify the importance of this collaboration: if rates of donation from deceased persons in the EU, currently at 18.1 donors per million population, reached those of countries with the highest performance, the lives of more than 20,000 people either with no chance at present of a vital organ transplant or otherwise condemned to chronic dialysis would be saved every year.

As you well know, Spain is very proud of its transplantation system, which allows our country to lead the world in the expression of solidarity that is organ donation. This has been possible since the beginning of the nineties, after the creation of the Spanish National Transplant Organization, ONT. Over the years since, we have developed a long experience of cooperation with other countries, either in a bilateral form with those requesting collaboration or through international organizations.

We have chaired the Commission of Transplantation of the Council of Europe for seven years, bringing about the development of most of the documents on which the current projects of the Commission are based. We believe that now is the time for the EU to implement these initiatives for cooperation, from which thousands of European citizens will benefit.

Yet the scarcity of organs for transplantation is a global problem, and any European strategy should be placed in a universal context. That is why this European Conference serves as an opening for a Global Consultation on donation and transplantation, organized with the WHO and TTS. The objectives are very clear: to progress in the pursuit of self-sufficiency in organ donation and to combat transplant tourism. I would like to give my warmest welcome to all the members of the different tourism. I would like to give my warmest welcome to all the members of the different entities, with my sincere wish for you to have fruitful work days among us and to go back to your countries with the best of impressions.

ONT is a WHO collaborative center, and its cooperative activities with countries from the five continents to promote organ donation are long-standing and have led to promising results. To provide an example, the case of Latin America should be mentioned. ONT, in close collaboration with the Pan American Health Organization, contributed to the creation of the Latin American Council on Donation and Transplantation five years ago. This entity has been decisive for the regulation and development of donation in all Latin American countries, with a very significant increase in organ donation rates of 20% in the past five years, and a training programme already delivered to more than 200 coordinators from Spanish and Portuguese speaking countries. About to finish the MASTER ALIANZA next Friday, some of the professionals trained as transplant coordinators in Spain are among us today.

To summarize, I believe that these working days that are about to start are the culmination of the Spanish approach to international cooperation in the transplantation field and will become a point of reference in worldwide collaboration. It is necessary to provide global solutions to universal problems, and Spain is prepared to contribute with the best of its experience in this area through ONT. I assure you that no effort has been spared in this endeavor and that we will continue doing our best to save lives around the world thanks to the universal expression of solidarity that is organ donation and transplantation.

THE MADRID CONFERENCE ON ORGAN DONATION AND TRANSPLANTATION is open."

Koenraad Vandewoude, Social Integration Responsible, Belgium refers to the Belgium Transplantation Law enacted in 1986, which already established the principles of altruistic donation and non-commercialization and provided for a presumed consent policy. In Belgium, organ allocation is performed through Eurotransplant. Belgium welcomes the Commission's proposal for a Directive on Quality and Safety Standards of Human Organs Intended for Transplantation, especially those provisions related to the voluntary and unpaid nature of donation, the characterization of donors and organs, and the foreseen possibility of building national registries for transplanted patients. All these elements are essential to ensure the quality of the organs and the safety of transplant recipients.

Janez Remskar, Transplant Coordinator, Slovenia stresses the importance of European and International cooperation for Slovenia, a small country with a population of only 2 million. The National Transplant Network was created in 1998, including 10 procurement hospitals and a single transplant center; therefore, it was not possible for the country to work alone. Slovenia started to work with Eurotransplant in 2000 and enacted its national Law on Donation and Transplantation that same year. A new law has been adopted in 2010, under which the policy of presumed consent is established. It is expected that this new policy will be of benefit for patients and their relatives, and will make easier the work of professionals. Because of the immense benefits expected from this European initiative, Slovenia highly supports the upcoming European Directive on Quality and Safety Standards of Human Organs Intended for Transplantation.

Current Challenges in Organ Donation and Transplantation in the EU

Session Chairs

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Enrique Moreno

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Organ Shortages and Disparities in Access to Transplantation in Europe

Rafael Matesanz

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Approximately 100,000 solid organ transplants are performed annually worldwide (of which almost 70,000 are kidney transplant procedures), providing excellent results in terms of survival and quality of life. Acute and chronic rejection of organs represents an important barrier in the development of transplantation services, which have been partially overcome with advances in immunosuppression. The main obstacle to further development is a shortage of organs: data from both Europe and the United States show waiting list growth far outstripping growth in incident transplantation rates. In the EU, approximately 60,000 patients were on the waiting list for a kidney, a liver, a heart, or a lung at the end of 2008, whereas only approximately 25,000 procedures of this nature were performed during that entire year. It is estimated that 12 EU patients die each day while waiting for an organ. A progressive increase in the demand for organs for transplantation, particularly for kidneys, is expected to occur in com-

ing years because of the epidemics of diabetes and arterial hypertension, along with the ageing of the population. A second significant challenge is ensuring the safety and quality of the organs available for transplantation. Risks are associated with the use of organs. Both infectious and neoplastic diseases have been transmitted from donors to recipients through the transplantation of a solid organ. Risks may be minimized with an appropriate evaluation of the potential deceased organ donor.

The diversity of organ donation and transplantation activities in the EU is highlighted by data collected by several EU-funded projects and data consortia, in particular the Improving the Knowledge and Practices in Organ Donation (DOPKI) project (www.dopki.eu). Opting-in and opting-out consent policies coexist in addition to variable organizational approaches. For example, not all EU countries have a NTO in place, and several are part of supranational organ exchange organizations, as Eurotransplant and Scandiatransplant. There are huge disparities in activities in donation from deceased persons, with Spain, where the number of deceased donors evolved from 550 to 1600 over the years from 1989 to 2009, as an international benchmark. The evolution of rates of donation after death in Spain is not the result of the implementation of what could be considered "classical approaches" in response to organ shortage, that is, promotional campaigns or registries of intention to donate. Nor is it because of a progressive swell of support from the population toward organ donation (a survey performed on a representative sample of the Spanish population showed similar percentages indicating support in 1993 vs. 1999 vs. 2006). Instead, the critical determinants of the success of the Spanish Model of Organ Donation have been the organizational improvements implemented: a coordination network, in-house transplant coordinators (mostly critical care physicians who assume the coordination role on a part-time basis), ONT as a support agency, a continuous brain death audit, training of healthcare professionals, close engagement with the media, and reimbursement of procurement activities.

Variation in mortality rates attributable to traffic accidents and cerebrovascular diseases in the EU do not apparently justify the regional differences in donation from deceased persons nor is there evidence of a correlation between the proportions of people who report that they would be likely to donate their organs after death and achieved rates of donation from deceased persons (http://ec.europa.eu/public_opinion/archives/ebs/ebs_272d_en.pdf), suggesting that a positive public attitude toward donation is not the major determinant of success. In EU countries where increasing rates of donation after death are being achieved, many of these donations are coming from aged donors in the 60+ and 70+ age categories, less frequently considered as potential donors in other countries. Another factor influencing disparities in deceased donation activity in the EU is the significant variation in uptake of DCD, with DCD not permitted by law in several jurisdictions, whereas in others, the necessary expertise is not available. In the United States, observed increases in organ donation rates evident since 2003 have affected both DBD and DCD. In contrast, rates of donation from deceased persons have stabilized in the EU during the same period of time, with the implication that this is in part

because of a lack of uptake of DCD in the region. Moreover, other specific strategies such as the United States Organ Donation Breakthrough Collaborative have helped the US progress in improving rates of donation from deceased persons in recent years.

The work carried out by the Council of Europe in the European setting is to be recognized, with more than 14 recommendations produced, along with an excellent informative tool on donation and transplantation activities and waiting list data: the Newsletter Transplant (available at: <http://www.ont.es/publicaciones/Paginas/Publicaciones.aspx>). These recommendations, in particular the European Consensus Document entitled "Meeting the Organ Shortage" have inspired the draft European Directive on Quality and Safety Standards of Human Organs Intended for Transplantation and the Action Plan. Intraregional European partnerships have also produced successful outcomes, for example, the cooperation between Italy and the Slovak Republic. Although extensive efforts for harmonization in Europe have been made, there is still a long way to go. The upcoming Directive and the Action Plan represent an excellent opportunity to move to a new EU situation where rates of donation from deceased persons evolve to the levels of the Southern countries, and rates of donation from living persons to those of Northern countries, while respecting the ethical framework laid out in the WHO Guiding Principles for Human Cell, Tissue and Organ Transplantation. Through the establishment of common standards of quality and safety for EU countries, it is also expected that the exchange of organs between MS will be facilitated, both better serving the needs of patients with particular transplantation needs and simultaneously avoiding the loss of organs not to be used locally for different reasons, that is, the lack of a specific transplantation programme.

Safety and Quality Systems in Organ Transplantation in Europe

Alessandro Nanni Costa

Director, Centro Nazionale Trapianti, Italy

Although safety and quality systems in transplantation have been recommended over the years, standards in this regard are highly variable among European countries. A comprehensive approach to safety and quality in organ donation and transplantation must extend from the moment of donor identification through to the follow-up of recipients, and cover all clinical, logistical, and decision-making aspects of the donation and transplantation process. This comprehensive approach should include:

- Donor management: identification, diagnosis, referral, first assessment, maintenance, family interview, recipient selection, organ recovery, second assessment, transplant, and follow-up;
- Pretransplant recipient management: diagnosis, indication for transplantation, clinical and immunologic assessment, inclusion in the waiting list, admission and treatment, periodic testing, selection for transplantation, summoning, preparation, transplant, and follow-up;
- Transplanted patient management.

In donor management, timing is a critical factor influencing quality, and its optimization relies on decentralized assessment and diagnostics. Thus, donor assessment

must be understood as a dynamic process, with risk levels assessed before recovery (through medical history, external examination, biochemical, serologic, and tool tests), confirmed or modified during recovery (through histology, biomolecular tests, palpation, and inspection), and reassessed during transplantation (through back-table surgery and autopsy).

In pretransplant recipient management, the critical issues in quality of care are the provision of dish homogeneous information to patients, inadequate or poor information on possible therapeutic options, different criteria for screening and admission, different composition and management of waiting list, and dish homogeneous or non-transparent allocation criteria. Consequences are confusion, comparison with other experiences, preclusion of choices, conditioning of healthcare pathway, patients moving from one transplantation center to the other, perception of inequalities whether justified or not, and high variation of waiting list satisfaction indexes, and risk of ethics violations and a lack of system transparency.

The management of the transplanted patient is the start of a new process, with two important factors influencing its quality: the failure to identify the person responsible for follow-up (resulting in the consequences of a discontinuous physician-patient relationship, possible "differences" in follow-up approach and difficulty in operational coordination between general practitioner and specialist), and the alternation of interlocutors (with behavioral differences in prescriptions and patient health care, possible duplication of physician interventions, and nonpersonalized management of follow-up).

Results of the DG SANCO survey on quality and safety of organs for transplantation were presented at the Venice Conference in 2003. No specific legal or technical provision regulated the traceability (14%), procurement (46.4%) and transplantation (32.1%) centers, and the storage of serum samples (32.1%) of a significant percentage of EU countries. In addition, risk assessment guidelines vary from country to country, and there is a need for clear protocols concerning the utilization of organs from donors with conditions such as neoplasia or history of tumor, positive viral markers for HCV and HBV, known risky behaviors for viral infections or emerging infectious diseases, among others (4). Protocols are also generally absent concerning upper age limits for donors. The evaluation of the acceptability of an organ is not absolute but is relative to the specific donor risk factor(s) in question and the type of organ(s) being evaluated. The complexity of this evaluation process gives rise to situations that are not always foreseeable and cannot be captured in a reference guide. Therefore, the transplantation process needs the support of on-call infectious disease specialists for accurate and adequate risk assessment. Ultimately, transplantation of organs from a high-risk donor cannot be justified in nonlife-threatening circumstances.

Communication of the European Commission: Policy Options and Impact Assessment

Isabel de la Mata

Principal Advisor in Public Health, DG Health & Consumers, European Commission

Action of the EU in the field of human organs intended for transplantation are based on the power conferred through

'The intended increase in the number of donors and available organs for transplantation cannot be achieved at any price'

(DOPKI Newsletter 2009, available at: <http://www.dopki.eu/Newsletter2009.pdf>)

article 168 (a) of the Lisbon Treaty, which allows the Union to establish: "Measures setting high standards of quality and safety of organs and substances of human origin, blood, and blood derivatives; these measures shall not prevent any MS from maintaining or introducing more stringent protective measures."

Any legislative process in the EU has the following steps:

- Problem identification;
- Open consultation;
- Impact assessment;
- Commission proposal;
- Co-decision procedure: Council & European Parliament.

In 2004, the Commission issued the following statement: "The important differences between organ transplantation and the use of other human substances such as blood, tissues, and cells mean that a specific approach for organs to ensure safety and quality is necessary. Such an approach in the current situation characterized by shortage of organs has to balance two factors: the need for organs' transplantation, which is usually a matter of life and death, with the need to ensure high standards of quality and safety. The Commission believes that before considering any proposal, it is necessary to conduct a thorough scientific evaluation of the situation regarding organ transplantation. The Commission will present a report on the conclusions of the analysis it undertakes as soon as possible."

In 2006, an Open Consultation was held with expert participation from MS, NTOs, Members of the European Parliament, the Pharmaceutical Industry, Patient Associations, and Medical and Surgical Associations. In 2007, the Commission published the document "Communication on Organ Donation and Transplantation: Policy Actions at EU Level." From this point forward, the European Commission, together with the MS, commenced work on legislation in this field. The open consultation allowed current problems and challenges in the field of donation and transplantation in the EU to be defined. Several policy options were weighed-up to confront the predefined problems, along with an assessment of the clinical and economic impacts of each of these options. From this in-depth analysis, the final best option consisted of (1) an Action Plan for MS to work on from 2009 to 2015; and (2) a flexible Directive on Quality and Safety Standards of Human Organs Intended for Transplantation, for which approval is foreseen to occur under the Spanish Presidency of the Council of the EU (January to June 2010).

The Action Plan identifies 10 priority actions, which are grouped under three challenges: to increase organ availability, make transplantation systems more efficient and accessible, and improve quality and safety in the donation and transplantation process. The priority actions are as follows:

1. Promote the role of donor transplant coordinators in every hospital where there is a potential for organ donation.
2. Promote quality improvement programme in every hospital where there is a potential for organ donation.

3. Exchange of best practices in programmes for the donation of organs from living persons among EU MS. Support registers of living donors.
4. Improve the knowledge and communication skills of health professionals and patient support groups on organ transplantation.
5. Facilitate the identification of organ donors across Europe and cross-border donation in Europe.
6. Enhance the organizational models of organ donation and transplantation in the EU MS.
7. Promote EU-wide agreements on various aspects of transplantation medicine.
8. Facilitate the interchange of organs between national authorities.
9. Evaluation of post-transplant results.
10. Promote a common accreditation system for organ donation/procurement and transplantation programmes.

The Directive intends to set down minimum quality and safety requirements of human organs intended for transplantation for EU MS. It excludes blood and blood components, tissues, and cells and organs of animal origin, and it covers the donation, procurement, testing, preservation, transport, and transplantation of organs. Main elements of the Directive are: the establishment of authority or authorities for national oversight, the authorization of procurement and transplantation activities, the establishment of National Quality Programs, ensuring the traceability of organs, the reporting of serious adverse events and reactions, the protection of the living donor, and ensuring a complete characterization of the donor and organ(s) to enable the transplant team to undertake an appropriate and individual risk assessment.

The Initiatives of the EU in the Field of Organ Donation and Transplantation

Session Chairs

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Jean-Marc Spieser

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European Legislative Framework on Quality and Safety Aspects of Organ Donation and Transplantation: The European Directive

Miroslav Mikolásik

Member of the European Parliament

The regulatory approach of this proposed Directive based on a framework model ensures that legislation is laid down to deal with key aspects of organ donation and transplantation, while not prescribing detailed policy measures that are the prerogative of MS. The Directive will ensure that the necessary quality and safety structures are in place, facilitating the conditions

for organ exchange and ensuring high standards of quality and safety for all patients in Europe. The Directive, given its binding nature, will support and trigger the implementation of key priority actions of the Action Plan.

The specific issues that have provoked particular interest during Parliamentary debate, giving rise to a set of proposed amendments in the Parliament report, are as follows:

1. Voluntary and unpaid donation: when the act of donation is not voluntary or foresees financial gain, the quality of the donation process can be jeopardized, because improving the quality of life or saving the life of a person is not the main, and the unique objective to be achieved. Hence, these are core principles in this new legislative framework.
2. Protection of living donor: information provided to and by the donor with regards to donation and a proper evaluation of the donor are essential to minimize the risks for both donors and recipients. Reimbursement to the living donor has been a subject of debate in the Parliament, with a specific proposal

for limiting that reimbursement to "making good the expenses and inconveniences related to donation." Conditions for such reimbursement would be then established by MS.

3. Data protection: the implementation of the proposed organ donation and transplantation scheme requires the processing of personal data relating to health of the organs, donors, and recipients by authorized organizations and healthcare professionals of the different MS. These data are deemed sensitive and fall under the strict rules of data protection on special categories of data.
4. Donation from living persons: to ensure that the principles of voluntary and unpaid donation are maintained, some issues regarding donation from living persons have raised concerns at the Parliament. Not aiming at limiting donation from living persons who are not close relatives, the Parliament would like to make clear the need to carefully examine and confirm the absolute altruistic nature of donation under these circumstances.

Box 1

The European Directive and The Action Plan: Key Points

The European Directive

- The Directive is primarily concerned with ensuring a high level of human health protection throughout the EU by establishing common minimum standards of quality and safety of human organs intended for transplantation.
- The Directive will establish the obligation of MS to designate one (or more than one) competent authority responsible for the implementation of the provisions set down in this Directive. A network of competent authorities will be subsequently coordinated by the European Commission, laying the grounds for the biggest organization related to donation and transplantation worldwide and covering a population of about 500 million people.
- The need to create a quality and safety framework, including transparent procedures for the adequate development of the process of donation and transplantation is set down in the Directive, along with the capability of control or auditing the activities. MS will also be required to establish systems for the authorization of organ procurement and transplantation, and specific requirements will be set down for the exchange of organs with third countries.
- A system for reporting serious adverse events and reactions is to be developed by every MS, which should also assure a system for traceability, while respecting confidentiality and data protection rules.
- The respect for principles consistently supported over the years by the WHO, the Council of Europe, and the EU is to be maintained. Donation is to be a voluntary and unpaid act, and the protection of the live donor is to be ensured. These principles imply the respect for fundamental human values but are also essential to not jeopardize the safety and quality of the process of donation and transplantation, the legal basis under which the Directive is built.
- The debate on the Directive is now being held, with such issues raised from the perspective of citizens, patients, and professional as the establishment of limits to donation from living persons, the inclusion of technical aspects in the legal text, and the consideration of a mandatory post-transplant follow-up registry.
- After its approval, MS will have 2 years to transpose the Directive into their national law. Along with the pursuit of increased quality and safety of organs for transplantation, benefits expected include the facilitation of organ exchange between MS and the creation of an effective system to combat organ trafficking.

The Action Plan

- The Directive is supported and complemented by the Action Plan on organ donation. The Action Plan sets out common objectives, agreed quantitative, and qualitative indicators for monitoring performance and benchmarking strategies, protocols for regular reporting, and identification of best practices, with the goal of increasing the number of organs available for transplantation.
- The Action Plan will promote a number of initiatives aimed at increasing organ donation through organizational changes that have proven effective in some MS (i.e., promoting the figure of the transplant coordinator or implementing quality assurance programmes in the deceased donation process). It will also help MS to evaluate the performance of their transplant systems and exchange best practices to improve them.

Box 1 cont.**Challenges for the European Union in organ donation and transplantation**

- The shortage of organs to cover the transplantation needs of the population is a European and a universal challenge. The disparity between supply and demand for organs means that many patients die or deteriorate whilst waiting for an organ, with an estimated 12 patients dying on the waiting list each day in the EU. As a result, a minority of patients are induced to seek alternative solutions outside of recognized ethical principles, usually in the form of transplant tourism.
- Although belonging to a common context, EU MS exhibit important differences in donation and transplantation activities. Variability in rates of donation after death between EU MS is not seemingly due to differences in mortality rates or in the public support to organ donation. On the contrary, differences in the organizational approach to donation from deceased persons might be the underlying reason for this variation. Donation from living persons also shows a different level of development between European countries.
- Specific types of organ transplantation, such as the heart or lung, are not performed consistently across Europe. In many instances, there is a significant scope to improve the number of organs recovered per donor, although for some countries a lack of the necessary expertise to support cardiothoracic transplantation is the barrier to the expansion of heart or lung donation and other transplantation programmes.
- Europe demonstrates several examples of multinational ambition and cooperation in organ donation and transplantation. However, with greater interregional cooperation and greater exchange of organs across borders, there is an emerging need for common safety and quality standards in transplantation at the EU level. On their own, these common standards could foster crossborder exchange of organs, which would increase the chances of transplantation for patients with very particular needs (pediatric, highly sensitized, and urgencies), and provide the opportunity of using surplus organs (because of the lack of an appropriate recipient or that of a specific transplant programme locally).
- A review of current knowledge and recommendations for quality and safety practices in organ donation and transplantation is needed, followed by an evidence-based update of these recommendations that develops clear protocols concerning the utilization of organs from donors with risk-related conditions or behaviors.
- Better risk prediction is urgently needed concerning the outcomes of transplants from expanded criteria donors and nonstandard risk donors. This would be facilitated by international coordination of monitoring and surveillance data from organ donation and transplant registries, and universal best practice in data registration. European cooperation would be enhanced by the formation of a Europe-wide registry of organ donation and transplantation policy, practice, and outcomes similar to the UNOS/SRTR.
- Efforts for harmonization, both in terms of donation and transplantation activities and in terms of quality and safety between European countries, have been pursued by the Council of Europe for years, and by the EU, through dedicated collaborative actions. However, there is still a challenging scenario where much remains to be done.
- In the diverse landscape just described and after a period of consultation and evaluation of different policy options, the European Commission intends to promote two complementary initiatives: a common legal framework to ensure common quality and safety standards for human organs intended for transplantation (the Directive) and an Action Plan integrating different actions targeted not only to ensure quality and safety but also to increase organ availability and to make the transplantation systems more efficient and accessible.

5. Death certification and consent: two additional amendments are worth mention: (1) "MS shall ensure that organs are not removed from a deceased person unless that person has been certified dead in accordance with national law"; and (2) "No organ removal may be carried out on a person who under national law does not have the capacity to consent it."

The Action Plan: Promoting the Cooperation Between EU Member States**Andrés Perelló***Member of the European Parliament*

The main motivation for the implementation of an Action Plan on organ donation is the need to increase the rate of transplantation overall and to reduce the disparities in the rates of donation and transplantation among EU MS, through cooperation and sharing of best practices. The Action Plan is developed in parallel to the Directive on Quality

and Safety Standards of Human Organs Intended for Transplantation. The report prepared by the Parliament on the Action Plan stresses once again the principle of voluntary and unpaid donation and demands MS put in place punitive measures against organ trafficking. It also opens discussions about donation from living persons and welcomes the establishment of rules of quality and safety for all MS.

The Proposal for a Directive on Standards of Quality and Safety of Human Organs Intended for Transplantation was voted in the Environment, Public Health and Food Safety Commission of the European Parliament on the May 16, 2009, and the result was a unanimous vote in favor. The spirit of the Parliament suggests a first-reading agreement on next May 2010.

Consistency in the debate concerning the key aspects of the Directive and the Action Plan should be maintained in the Parliament. Because donation from living persons, developed under solid ethical principles, is a necessary component of strategies to confront organ shortages, restrictions to donation from

living persons in the EU that are currently being considered could potentially inflate problems with respect to organ trafficking and transplant tourism. Desperate patients may be driven to search for alternatives outside of the legal and ethical framework that we pursue. The Action Plan should aim to increase donation rates in the EU while fostering solidarity as the way to avoid violations of fundamental human values.

The Patient's Perspective

Terence P. Mangan

Chairman, European Heart Lung Transplant Federation, Ireland

Differences in donation and transplantation activities, most particularly for thoracic organs, become evident in the analysis of available data in Europe, even when comparing countries with a similar capacity to perform transplantation. Heart and lung transplantation activities are highly variable and differently developed between countries even with similar overall rates of donation after death. In many instances, there is significant scope to improve the number of organs recovered and transplanted per donor, although for some countries there is a lack of the necessary expertise to support cardiothoracic transplantation. Refusals to consent to organ donation after death are a key factor in the variation in donation and transplantation rates in Europe. In this context, the importance of the European Donation Day to raise awareness of the importance of organ donation after death among the general public is to be highlighted. However, there also needs to be a focus on the way the approach to organ donation is made, that is, who asks, what to say, how to say it, and when to say it. The pillars of our activities should be the equal access to high quality transplant services in MS, the professional and timely post-transplant care, and maintenance and the right to appropriate post-transplant immunosuppressive drugs and medication.

Alejandro Toledo

President, Federación Nacional de Asociaciones para la Lucha contra las Enfermedades Renales, Federación Nacional de Asociaciones para la Lucha contra las Enfermedades Renales (ALCER), Spain

Reflection

*You are the warm sun on my face
The gentle wind on my back
You are the song in my heart
The music in my soul
You are the promise of spring
And the glory of autumn
You are my future
And my past
You are my Donor
And I am humbled*



During the 1970's, end-stage kidney failure patients were able to survive on the basis of reasonably widespread access to dialysis. Organ donation and transplantation did not have a legal basis yet in Spain, and the public knowledge of this option was scarce. ALCER was created in 1976 and strongly supported the development of a Transplant Law in Spain during the period 1977 to 1978. Our Transplant Law was finally enacted in 1979.

During the 1980's, organ donation remained scarce, and the patients' association put pressure on society and politicians. It was the time to consider the need for a National Coordinating Organization. It was in 1989 that, in response to this pressure, ONT was created. The need for a NTO has been put forward internationally as a basic element for a deceased donation system to be effectively established and consolidated. ALCER continues acting in support of donation and transplantation through many activities, making evident the extent to which patient associations are stakeholders with a specific contribution to make to the pursuit of self-sufficiency in transplantation. ALCER is now engaged in activities such as the provision of information to patients and their relatives about donation from living persons, and in updating patients about initiatives that may help them to improve their quality of life and life expectancy.

Transplant Professionals' Perspective

Ferdinand Mühlbacher

Head, Division of Transplant, Medical University of Vienna-Austria

Three European Regulatory bodies in the field of donation and transplantation currently coexist: (1) the Council of Europe (47 MS) that has produced several recommendations; (2) the EU (27 MS), acting on the basis of article 168[a] of the Lisbon Treaty (previous 152a of the Amsterdam Treaty), now releasing the Directive and the Action Plan; and (3) National Governments producing the corresponding national legislation. The Council of Europe has been working on issues of safety and quality of transplantation for several years and has produced a guide to safety and quality assurance for organs, tissues and cells containing information on basic principles for quality management, selection of donors, organ procurement and preservation, tissue and cell procurement, tissue establishments, and transplantation practices (http://www.coe.int/t/dg3/health/Source/GuideSecurity2_en.pdf). The last edition included an addendum on "Criteria for preventing the transmission of neoplastic diseases in organ donation." This guide is a reference document for European countries.

Donation and transplantation, whether of organs, tissues, or cells, is not without some risk for the living donor, the recipient, and the healthcare professionals involved. Donor risks can be broadly categorized into those relating to the function of the transplanted organ and those concerning the transmission of diseases (tumor, viral, or bacterial infections or metabolic disorders). Donor risk factors relating to organ function are age, race, height, body mass index, cause of death [cerebrovascular accident (CVA) and trauma], DBD vs. DCD (controlled vs. uncontrolled), type of graft (full size, split, and reduced size), cold ischemia time, steatosis, inotropic support, electrolytes (natremia), local recovery, histology grading, laboratory data, and surgical judgment. Several issues are still under debate. Anti-HCV, anti-hepatitis B core antigen, and hepatitis B surface antigen prevalence varies according

to the presence or absence of risk behavior, according to the Center for Disease Control and Prevention, Atlanta, USA (CDC) (5). The reduction of the so-called window period is possible through the use of the nucleic acid tests. However, currently, there is no sufficient evidence to recommend the universal prospective screening of organ donors for HIV, HCV, and HBV by nucleic acid tests.

Donor-derived diseases have also been a subject of research. Through a dedicated initiative, the United Network for Organ Sharing (UNOS) recorded information on donor-derived diseases in organ transplantation, recently published for the years 2005 to 2007 (6). Both infections and malignancies were reported as having been transmitted.

The EU Directive on Quality and Safety Standards of Human Organs Intended for Transplantation and the Action Plan are focused on increasing the availability of organs, developing more efficient and accessible transplant systems, and improving the quality and safety of the organs transplanted. However, three outstanding issues are identified, from the professionals' point of view, as not being adequately addressed by the Directive in its current form. These are:

1. The concept of self-sufficiency, and a requirement for MS to do their utmost to improve organ donation, should be covered at least be in the preamble.
2. Although safety and quality measures are considered in the Commission proposal, no medical details should appear in a law. On the contrary, the current annex should make reference to "the best medical practice," with recommendations produced every 2 years by a scientific-based body (i.e., Council of Europe CD-P-TO, ESOT, or a specific Expert Group at the Commission).
3. A European Registry for the surveillance of donors and recipients is essential to monitor and evaluate quality outcomes. Although a follow-up registry for the living donor is foreseen in the Directive, there is no specific provision for the follow-up of transplant recipients. A registry similar to the UNOS/Scientific Registry of Transplant Recipients (SRTR) database in the United States should be a goal for Europe. Currently, we are limited to extracting conclusions from the US registry while acknowledging the expected differences between the US and the EU populations.

These gaps in the Directive present future challenges for the EU and should be the subject of ongoing improvements to this framework.

The Pursuit of Self-Sufficiency: A Global Challenge

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Donation and Transplantation in the WHO Agenda

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Rapid medical advancements and the demonstrated success of transplantation procedures have significantly in-

creased demand for human organs, tissues, and cells. Despite considerable achievements in donation, demand continues to outstrip supply, especially with respect to solid organs for transplantation. Approximately 100,000 organs are transplanted globally each year, however, given an estimated burden of end-stage organ disease affecting upward of one million individuals, this accounts for less than 10% of global need (7). The 90% of people with end-stage organ failure who do not have hope of a transplant will die from their disease or, in the case of end-stage kidney failure, be dependent on ongoing and costly dialysis therapy. In many regions of the world, affected persons lack access to basic healthcare services in which their need for transplantation would be recognized, let alone met. For those who hope to receive a transplant, the implications of the scarcity of human materials for transplantation are that: (1) individuals in need may not be registered on transplant waiting lists, because inclusion criteria are influenced by the availability of organs for transplantation; (2) wait-listed persons may die while awaiting transplantation; and (3) some individuals, facing desperate situations, may seek to obtain an organ by engaging in practices such as transplant tourism, organ trafficking, or transplant commercialism.

These unethical practices exploit the poorest and most vulnerable groups in society, undermine altruistic donation, compound socioeconomic disparities in the utilization of transplantation, violate the most basic of human values, contravene the Universal Declaration of Human Rights, and have been repudiated by international institutions and professional societies. The global shortage of organs, tissues, and cells for transplantation must therefore be met by strongly regulated environments to ensure safety, quality, efficacy, and ethical practice in all aspects of organ donation and transplantation programmes. Health authorities should promote donation and transplantation motivated by the needs of recipients and the benefits to the community, and any measures to encourage donation should respect the rights of donors and foster social recognition of the altruistic nature of donation. These issues have been the subject of successive WHO Resolutions concerning organ donation and transplantation (WHA 40.13/1987; WHA 42.20/1989; WHA 44.25/1991; WHA 57.18/2004).

Since their adoption by the WHA nearly 20 years ago, the WHO Guiding Principles for Human Cell, Tissue and Organ Transplantation have played an important role in influencing legislation, national policies, and professional codes and practices in the donation and transplantation of human organs (WHA44.25). These Principles are concerned with maximizing the benefits of transplantation by addressing the needs of recipients, protecting donors and recipients at all stages of the organ donation and transplantation process, and ensuring the dignity of all involved. In response to improvements in transplantation medicine and science, and evolving practices and perceptions regarding organ and tissue transplantation, a consultative process was commenced in 2004 to update these Principles. Proposed revisions were the subject of a global consultation held in Geneva in October 2007. Revised Guiding Principles, reformulated to cover practices identified since the original resolution was adopted in 1991, were endorsed by the 124 Executive Boards of the WHO in January 2009 (Document EB124/15). The revised Principles articulate a strengthened commitment to the

safety, quality, and efficacy of donation and transplantation procedures and the human materials used, and request transparency in the organization and performance of donation and transplantation activities. They call for prohibition of commercialization of cells, tissues, and organs for transplantation and pay particular attention to the protection of vulnerable populations. The priorities of the Principles are to protect living donors, patients, individuals, and society, to foster public trust in transplantation and donation and to combat organ trafficking. The WHO Guiding Principles for Human Cell, Tissue, and Organ Transplantation therefore encourage proper respect for human body parts and their donors, and for the patients receiving donated cells, tissues and organs, and provide a framework for the development of fair and equitable transplant services.

Global commitment to the WHO Guiding Principles and to the eradication of the international trade in human tissues and organs is gathering momentum. China, Pakistan, the Philippines, Colombia, and Egypt, countries which were major destinations for transplant tourism, have each begun to introduce transplantation legislation prohibiting organ sales. China implemented the State Council Law on Human Organ Transplantation in May 2007, which prohibits financial compensation for donors, prioritizes transplantation for Chinese citizens over foreign nationals, and articulates consent processes and donor rights (8). This legislation also establishes minimal requirements that medical institutions must fulfill to be approved to perform transplantation. Transplant tourism in China has been markedly reduced since the introduction of this legislation, and China is now seeking to formulate legislation concerning brain death, to support the development of ethical organ donation from deceased persons. The Philippines introduced a Presidential ban on Foreigner Transplantation in April 2008, and The Philippine Society of Nephrology report that access to commercial kidney transplantation by foreign nationals has been significantly reduced (9). In 2009, Colombia introduced a Resolution prohibiting transplantation to foreigners while Colombian patients remain on the waiting list. In March 2010, Egypt passed a transplantation law banning organ trafficking, restricting donation from living persons to family members, and permitting regulated donation from deceased persons. Also in March 2010, Pakistan signed into law the Ordinance on Human Cell and Tissue Transplantation, prohibiting the sale of organs and providing for organ donation after death.

These efforts are strongly supported by the WHO and by professional societies. In May 2008, an international meeting of representatives of scientific and medical bodies, government officials, social scientists, and ethicists, convened by TTS and ISN, produced the Declaration of Istanbul on Organ Trafficking and Transplant Tourism (1). The Declaration of Istanbul urges every country to implement legal and professional frameworks governing the recovery of organs from deceased and living donors and the practice of transplantation that are consistent with international standards of transplantation policy and practice. The Declaration also calls for the transparent regulatory oversight of organ donation and transplantation practices, intended to ensure donor and recipient safety, enforcement of standards, and the prohibition of unethical practices. As organ sales, transplant tourism, and trafficking in organ donors are largely an undesirable conse-

quence of the global shortage of human materials for transplantation, concomitant with the need for effective legal frameworks and regulatory systems is the need to increase sufficiency in the supply of organs, tissues, and cells for transplantation. Thus, the Declaration of Istanbul states that "Jurisdictions, countries, and regions should strive to achieve self-sufficiency in organ donation by providing a sufficient number of organs for residents in need from within the country or through regional cooperation."

Wide international variation in transplantation activity (Figs. 3 and 4) not only reflects vast global inequity in access to transplantation but also demonstrates the capacity of different approaches to the delivery of organ donation and transplantation programmes to produce better outcomes. For most high-income countries, current models of service delivery have not met the needs of patients, and there is scope for significant progress in the provision of transplantation. The high prevalence of chronic diseases contributing to end-stage organ failure such as chronic kidney disease, estimated to affect 10% to 15% of adult populations (10–13), and the global epidemic of diabetes (14) underscore the need for action. There are also compelling economic arguments for self-sufficiency, taking the example of Japan where approximately US \$15 billion is now spent annually on providing treatment to more than a quarter of a million individuals requiring maintenance hemodialysis (15).

In addition to disparities in transplantation activity, extensive international variation in the relative proportion of deceased vs. living donors is also apparent (Fig. 4), demonstrating widespread underutilization of the resource of deceased donor organs. Unrelenting growth of unmet demand for transplantation, and a perceived inability to successfully develop deceased donation, have led to a trend toward invoking payment as the easiest approach to a greater supply of human materials and proposals of market-based solutions, which rely on deceased or living donors sourced from domestic, or from foreign, populations. Such proposals present a growing challenge to the basic principles of equality of human beings and integrity of the human body.

Responding to the need for action, a global network of health authorities, scientific and professional societies, and experts, drawn from every region of the globe and level of development, has formed with the support of the WHO and is working to advance a common global attitude to transplantation and models of service provision that can meet recipient needs while preserving the dignity of donors. A comprehensive framework for policy and practice directed at the global challenge of satisfying organ donation and transplantation needs, consistent with the WHO Guiding Principles for Human Cell, Tissue and Organ Transplantation, was developed by this network through a consultative process. The extensive recommendations of participant working groups are given in full in *Part II* of this report.

Self-Sufficiency as a New Paradigm: Definition and Significance

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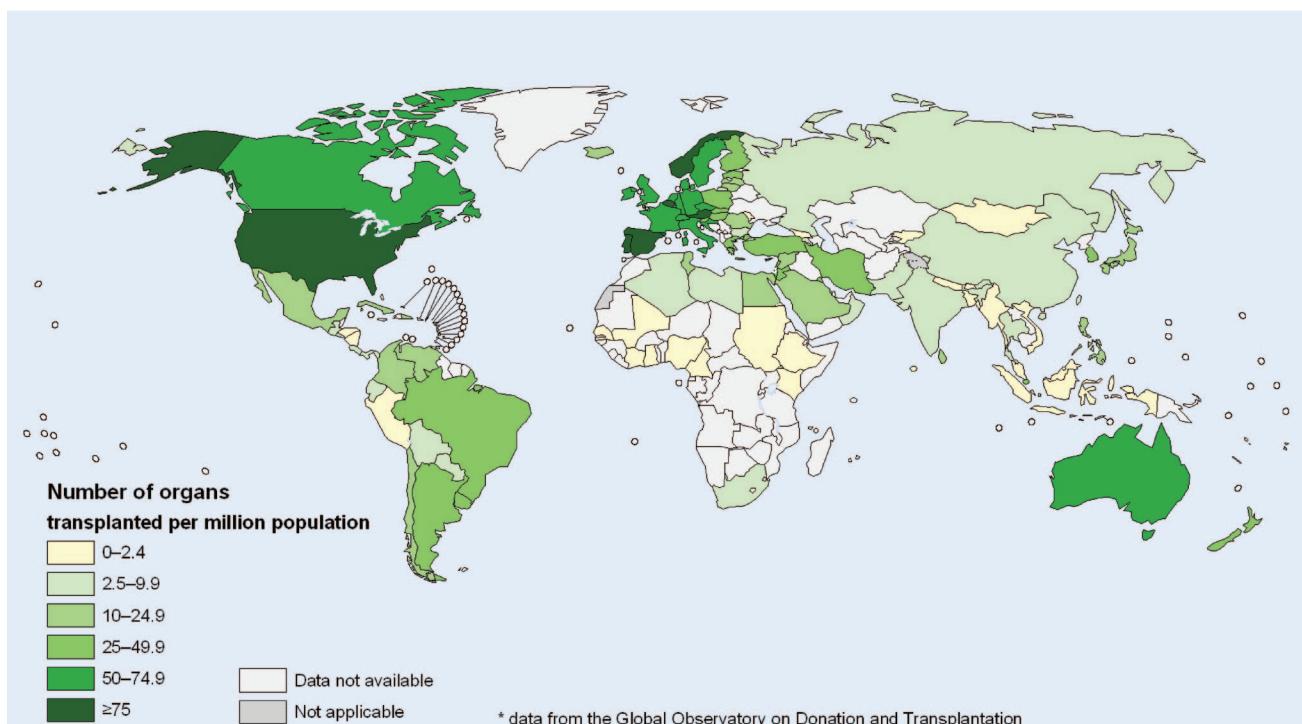


FIGURE 3. Global transplantation activity in 2008. Map shows solid organs transplanted per million population. Data from (7).

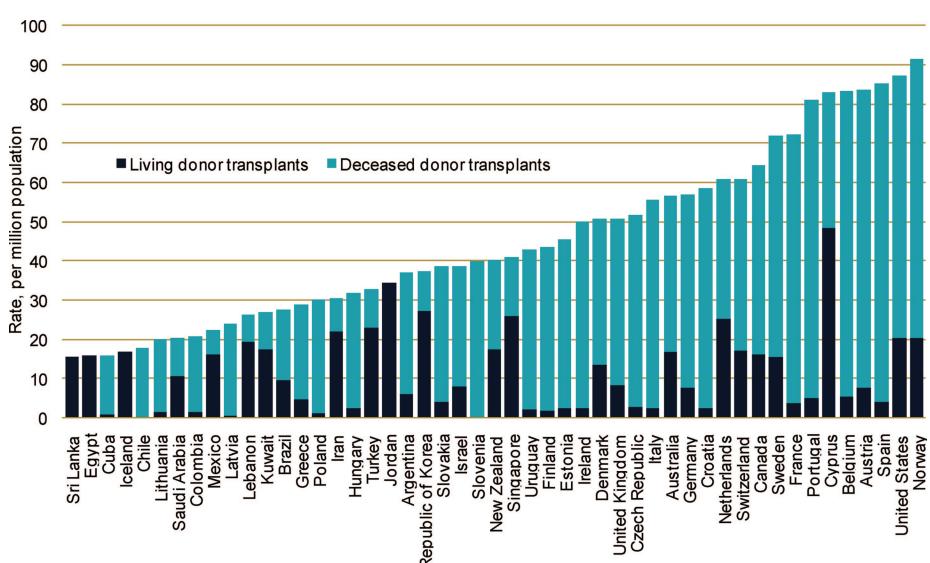


FIGURE 4. Transplanted organs per million population in 2008, for the 50 most active countries globally. Data are taken from (7).

Self-sufficiency in organ donation and transplantation means equitably meeting the transplantation needs of a given population, using resources from within that population. Although each country will strive to develop a sufficient supply of cells, tissues, and organs from donors within that country, regional cooperation may be necessary to effectively use all

donations and to address the most urgent needs of patients. Therefore, self-sufficiency may be pursued at an individual country level or through mutually beneficial regional organ exchange networks and international collaborative efforts (16). The concept of pursuing self-sufficiency is founded in concerns for equity in access to health care, transparent justice

in the distribution of burdens and benefits of transplantation and donation, solidarity in the recognition of a common goal and responsibilities, and respect for the human right to health and dignity. The pursuit of self-sufficiency is a multifaceted enterprise that has four main objectives: effective commitment from governments, community involvement, prevention of end-stage organ failure, and the identification and utilization of all possible deceased donors.

The pursuit of self-sufficiency is a national responsibility and begins at a jurisdictional level. The active commitment of government is required to produce the legislative framework necessary to combat unethical practices, allow deceased donation programmes to grow, promote equity, and uphold the importance of organ donation in the community. Governments also have a critical role in the authorization and oversight of organ donation and transplantation programmes. At the same time, the pursuit of self-sufficiency is a public project, based on the community-oriented values of reciprocity, solidarity, equity, and voluntary donation. Community involvement is essential to successful transplantation programmes, which depend on public participation at every level. All members of the population need to be engaged as participants in the development of an organ donation culture, and as stakeholders in the goal of universal access to the benefits of transplantation. To this end, transplantation authorities have a responsibility to build organ procurement systems and transplant programmes that are endorsed by society and are transparent in their outcomes and processes.

Meeting the needs of patients not only means providing access to transplantation but also investing in the prevention of end-stage organ failure. Significant global variation in incidence of end-stage organ disease, for example, a 3-fold difference in the incidence of end-stage kidney disease in Norway compared with the United States, clearly demonstrates the potential of prevention to reduce transplantation needs (10). Prevention is inherent to the objectives of Transplantation Authorities and professionals and must be supported as such. Furthermore, minimization of transplantation needs through prevention is the only feasible approach to self-sufficiency in resource-poor settings where cost and infrastructure requirements preclude the development of transplantation services. An example of an effective prevention programme running on limited resources has been underway for several years in rural India and has had demonstrated success in reducing mean blood pressure and blood glucose in the target population (17). Prevention of end-stage organ failure starts with primary prevention: promotion of healthy lifestyles and basic preventive interventions including vaccination.

In addition to concerted efforts in prevention, the pursuit of self-sufficiency requires the development of effective deceased donation programmes, complemented by organ donation from living persons. Identifying and mobilizing potential resources to maximize donation from deceased persons, through transparent and ethical practices that respect society's values and universal human rights and principles, is a priority. Only certain types of organs can be donated by living donors, moreover living organ donors face a variety of risks ranging from the implications of undergoing eligibility testing to the potential

complications of organ removal, which may be physical, social, financial, or psychologic. The highest possible level of protection of living donors must be ensured, which requires maximizing donation from deceased donors, so that the need for living donors be kept to a minimum. Donation after death is also considerably more effective than donation from living persons; a single deceased donor may provide upward of three organs for transplantation (18). An average deceased donor in the United States has been estimated to provide an additional 30.8 life years shared between 2.9 recipients (19). Optimal utilization of deceased donor potential requires the existence of appropriate legislative and organizational frameworks, effective coordinating authorities, and community awareness of the importance of organ donation and participation as registered donors. Public education, including health education in school curricular, will contribute to awareness and support this objective.

The pursuit of self-sufficiency offers a framework for approaching the challenge of organ shortages that is grounded in community participation and intersectoral and interdisciplinary cooperation. The scope of this goal encompasses disease prevention, legislation and regulation, implementation of organizational infrastructure, donation, and public education, as complementary elements of a comprehensive strategic approach to the needs of patients and the community at large. Self-sufficiency also frames organ donation and transplantation in a broader health services context and is strongly concerned with health equity and ethical practice. Adopting the goal of self-sufficiency emphasizes that access to transplantation should not be the prerogative of a privileged few but rather that transplantation programmes should be a feature of comprehensive and well-organized public healthcare systems. Enhancing collaboration between the different agencies and organizations working in areas that influence transplantation needs and resources will optimize the efficiency, efficacy, and quality of healthcare services provided and has the potential to greatly advance the goals of transplantation medicine and of public health.

The Pursuit of Self-Sufficiency as a Global Objective

The Role and Responsibilities of Health Authorities in the Pursuit of Self-Sufficiency

The human right to health and dignity implies a right to the recognition of all human needs for transplantation. Therefore, practically and ethically, self-sufficiency must be conceived as a common global goal. Action, however, begins locally. The intrinsic requirements of organ donation and transplantation programmes in terms of resources, organization, and regulation are responsibilities of the State, and the procurement of human body components from living and deceased persons rightly falls under State jurisdiction. Furthermore, governing authorities have political and ethical obligations to promote the health and protect the interests of their citizens, for which there is a reciprocal duty of citizens to contribute to shared public goods such as transplantation. That is, all members of society who stand to benefit from organ donation have a duty to participate in organ donation after death, where eligible to do so. A corollary of this is that persons and populations who are excluded from a potential

Box 2**Special report from India:**

Dr. Rakesh Kumar Srivastava, Director General of Health Services, Ministry of Health and Family Welfare, Government of India

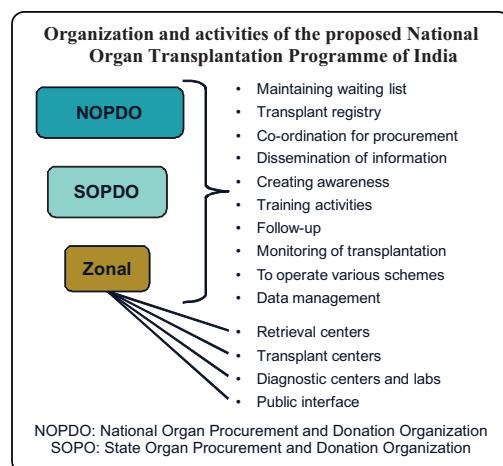
Transplantation in India faces significant challenges with respect to the large burden of end-stage organ failure in the country, a lack of necessary infrastructure, organization and coordination of health services, low awareness and negative attitudes toward organ donation, and the costs of treatment. The incidence of end-stage kidney disease in India is estimated to be 150 to 175 per million population per year (or between 150,000 and 175,000 cases) and is attributable to diabetes in 30 to 40% of patients (20,21). Liver failure affects approximately 50,000 persons per year, with HBV as one of the common causes. Heart failure similarly affects approximately 50,000 persons per year. To meet this burden of disease, India has 180 renal centers, 25 liver centers, and 10 cardiac centers for transplantation, staffed with 160 renal surgeons, 25 liver surgeons, and few cardiac surgeons. Of these facilities, approximately two thirds are located in South India, and 80% are in the private sector.

Organizational challenges include uncoordinated trauma care, the absence of a national coordinating network to provide oversight and regulation of organ donation and transplantation activities, and underdevelopment of public-private partnerships that could improve access to transplantation services. In addition, multitude donor cards have been introduced by multiple agencies with a lack of organization of these and other activities in organ donation. A lack of awareness about organ donation and transplantation is found at both the public and professional level, and religious reservations and negative attitudes toward organ donation are pervasive. Finally, the direct and indirect financial costs of transplantation surgery and maintenance are prohibitive. For example, the cost of immunosuppression using tacrolimus, steroid, and mycophenolate is US 350 to 400 per month, or nearly US 5000 per year (21). Transplantation is, however, achieved at much lower cost than in high-income countries, in particular through the use of generic immunosuppressants. Also, insurance schemes do exist that may assist with the cost of treatment for some patients.

India passed the Transplantation of Human Organs Act (THOA) in 1994. This legislation introduced regulation of transplantation for therapeutic purposes, legal acceptance of brain death, and prohibition of commercial dealings in human materials with penalties in the event of violations of the law. In recent years, the provisions of the Act have been the focus of a national consultation process intended to introduce legislative reforms that will improve rates of donation from deceased persons and support living-related transplantation. Plans for reform to the Act include a renaming to "The Transplantation of Human Organs and Tissues Act," inclusion of grandparents and grandchildren in the definition of near relatives, recognition of procurement centers, approval of paired donor exchanges, making it mandatory for the treating staff to request relatives of brain-dead patients for organ donation, and mandatory creation of transplant coordinator positions in all hospitals performing transplantation. Further reforms include accreditation of laboratories, simplification of brain-death certification committees, the establishment of a National Transplant Registry, revisions to forms and procedures, and greater regulation surrounding women, minors, and foreign nationals.

Currently, India performs approximately 4000 kidney transplants per year, 250 liver transplants, 10 heart transplants, and 25,000 corneal transplants. Kidney transplantation activity is predominantly based on living donors. With the aim of improving organ availability and increasing transplantation, the government is planning to start the National Organ Transplant Programme (NOTP). The objectives of the NOTP are to minimize end-stage organ failure, treat end-stage organ disease patients, promote organ donation from deceased persons, centralize organ procurement and distribution systems, and strengthen transplantation infrastructure and coordination on a national scale (11). In this capacity, the NOTP is establishing new facilities for transplantation, strengthening existing facilities, conducting training activities, and is establishing a National Tissue and Biomaterial Centre. Additional strategic activities of the NOTP include an information, education and communication campaign concerning the legal provisions of the THOA and organ donation, and activities aimed at reducing the costs of transplantation. Other recent organizational achievements for organ donation and transplantation programmes in India include the beginnings of public-private partnerships, the growth of state-based and other networks, for example, an Armed Forces Organ Retrieval and Transplant Authority, reform of the donor card system, and increasing advocacy for donation after death through media engagement, involvement of key opinion leaders, celebrity endorsements and public events such as World Kidney Day.

Finally, India is also taking steps toward managing its population burden of diseases contributing to end-stage organ failure. Despite limited budgetary support for public health, several comprehensive prevention initiatives have been implemented. Examples include the National Rural Health Mission and the National Programme for Prevention and Control of Diabetes, Cardiovascular Diseases and Stroke. Additional initiatives include an integrated disease surveillance programme, introduction of universal HBV vaccination, a tobacco law and programme initiative, and a national alcohol policy. Intersectoral health promotion efforts will also contribute to decreasing the burden of these diseases.



Box 3**Special report from China:
Professor JieFu Huang, Vice Minister, Ministry of Health, Peoples' Republic of China**

Today, China performs the second largest number of organ transplants in the world at a rate of approximately 10,000 transplants per year. Nearly, all forms of transplantation are performed in China: transplantation of kidneys commenced in 1969, followed by pancreas transplantation in 1989, liver in 1993, small intestine in 1994, and heart and lung in 2003. Achievements for organ donation and transplantation programmes in China include the development of basic and clinical research, standardization of transplantation techniques, the rapid expansion of clinical applications, training of a large number of skilled young medical professionals, international knowledge exchange and cooperation, and significant improvements in post-transplantation survival rates and patient management.

However, the development of organ donation and transplantation in China has also experienced problems, most particularly with respect to commercialization of organs, transplant tourism, and an overreliance on organs obtained from executed prisoners, a source of deceased donor organs that is not consistent with international ethics and standards of practice. These problems are compounded by scarcity in the supply of organs available for transplantation and the lack of a national system for organ donation and allocation that is subject to appropriate oversight and regulation. There are approximately 1 million end-stage kidney disease patients on maintenance dialysis and approximately 300,000 terminal liver disease patients requiring organ transplantation in China. The lack of a legal, sustainable, and sufficient donor pool to meet the needs of this vast number of end-stage organ failure patients is the greatest challenge for facing transplantation programmes in China. Organ procurement, allocation, and recipient selection are currently hospital based without centralized standards or a transparent registry system. Regulations have lagged behind medical progress, with transplantation therefore expanding in an unregulated manner (8). Some hospitals trade with illegal organ agencies and sell organs to foreigners for profit. The illegal trade in human organs that has emerged in China has created a tremendous profit chain that runs contrary to the principle of equity and the goal of building a harmonious society.

Ethical organ transplantation is not possible without the development of ethical organ donation processes and a regulated organ allocation system. Donation of organs from deceased individuals must be dependent on the good will of individuals and families in a system of voluntary donation with informed consent, moving away from the current system in which more than 90% of grafts are obtained from executed prisoners. Additional safeguards introduced to protect the rights of row inmates include the requirement for written consent to organ removal from the donor and the right to review of all death sentences by the Supreme People's Court. The long-term goal for social development is to abolish the death penalty; however, until such a time, regulations are needed to protect the individual rights of prisoners and to separate transplantation programmes from the prison system (8).

Since the implementation of the Regulation on Human Organ Transplantation in May 2007, which introduced bans on transplant tourism and established an accreditation system for clinical transplantation services, a significant decrease in liver transplants to foreign nationals has been reported, with the number of liver transplants in non-Chinese patients decreasing from 624 in 2006, to 2 approved cases in 2009. Under the accreditation system, which provides a framework of baseline requirements and guidelines, only 163 hospitals have been granted a license to perform organ transplantation. Since the enforcement of the Regulation, the certificates of seven accredited hospitals have been revoked, and eight physicians' licenses have been suspended. Reforms have also had the effect of decreasing the number of deceased donor transplants being performed in Chinese citizens and have prompted a dramatic increase in living-related kidney and liver transplantation over the past 2 to 3 years. In addition, driven by the scarcity of available organs and by profiteering by organ brokers, organs sales by the poor and vulnerable are increasing.

National Organ Transplantation Work Scheme, P.R. China	
5	Scientific Registries for Organ Transplantation Establish a scientific based policy-making process
4	Accreditation System for Clinical Transplantation (163 certified hospitals) Quality assurance Accreditation systems for hospitals/professionals Establish guidelines for clinical practice
3	China Organ Allocation and Sharing System Ensure equality, justice and transparency National Waiting List Organ Matching System
2	National Organ Procurement Organization System (OPOs) Ensure effective use of transplantable organs
1	National Organ Donation Campaign Establish a donor registration system Promote organ donation Voluntarism

The future development of organ transplantation in China requires that a national transplantation programme be established that provides oversight, is responsible for the implementation and monitoring of organ procurement and transplantation programmes, and is able to increase administrative efficiency by maintaining a balance of authority between central and provincial governments. The National Organ Transplantation Work Scheme outlines a systematic project plan for the development of China's organ transplant system, conceived within a broader context of healthcare reform and development. The Scheme involves five goals: promote voluntary donation; enable efficient organ procurement and utilization; ensure equity, justice, and transparency in allocation; establish quality assurance processes and establish a scientific registry for organ transplantation. Registries will inform the policy-making processes of the National Organ Transplantation Committee (OTC) and help to ensure the highest professional standards in the delivery of transplant services. Internationally recognized medical criteria regarding patient priority ranking, organ matching, allocation, and sharing principles will be adopted by the OTC and specialist committees. OTC policy states that "*National waiting list and organ allocation systems shall be established to address medical needs of patients and ensure the principles of equality, justice and transparency.*" To support the implementation of these policies, The Ministry of Health has developed the China Organ Allocation and Sharing Computer Network.

China is planning additional regulations for this new phase in transplantation. Working Conferences have generated initiatives concerning brain death (Beijing, April 2008) and organ donation (Shanghai, August 2009). Most recently, the Red Cross Society of China, together with the Ministry of Health, commenced a pilot programme of DCD. Launched in March 2010, this programme involves public education, a campaign to register donors, and provides guidelines for organ allocation. DCD potentially offers a means to expand the donor pool in a practical and ethical way, thereby reducing the demand pressures driving the illegal organ trade and the overreliance on unethical organ sources. With the support of the Red Cross Society of China, China is working toward building an effective and ethical deceased donation programme, based on the principle of altruism, which balances the demand for organs against a framework of values acceptable to Chinese society. ■

share in the unique benefits of transplantation must be protected from practices that outsource the burden of organ donation. Similarly, the burden of donation should not be unjustly imposed on particular members or groups within a population. In all circumstances, the duty to donate is limited by the right not to be harmed.

The practical implementation of self-sufficiency strategies will vary for different populations; however, the inherent values of the self-sufficiency paradigm and the key elements of the WHO Guiding Principles should guide policy and be reflected in practice in all contexts. The pursuit of self-sufficiency and the adoption of ethical practices in organ procurement and transplantation are mutually reinforcing. Approaches to self-sufficiency that uphold the interests and well-being of all members of a population will naturally conform to principles of justice, harm minimization, and respect for human dignity.

Countries with low economic and health sector development may lack much of the basic infrastructure required for the development of domestic organ donation and transplantation programmes, such as transplant surgeons, intensive care facilities, suitable storage facilities, and adequate diagnostic services. However, the pursuit of self-sufficiency is not conditional on a particular level of resources. Indeed, national approaches to self-sufficiency should be conceived within the context of the wider healthcare system, be consistent with public health goals, and must take account of the immediate needs of the population and available resources. Achievements in the pursuit of self-sufficiency should be celebrated with respect to relevant benchmarks that acknowledge the relative resource constraints and the unique challenges facing donation and transplantation in different populations. For example, the successful implementation of a public health programme to prevent a disease that contributes to the need for transplantation in one country should be considered as important as an increase in donation rates in another. Progress toward self-sufficiency will take time, but the potential benefits extend well beyond organ donation and transplantation to include practical consequences for health systems and the reinforcement of societal values of equity, transparency, solidarity, and social justice.

The Crucial Contribution of Health Professionals to the Pursuit of Self-Sufficiency

Jeremy Chapman

President, TTS

Francis Delmonico

Director of Medical Affairs, TTS

Health professionals have a crucial contribution to make to the pursuit of self-sufficiency as the medical interface with patients, as advocates for patients, and in developing and exchanging technical expertise. Global leadership in the field of transplantation medicine is provided by TTS. The Society has specific responsibilities in the development of the science and clinical practice of transplantation, in scientific communication among physicians and researchers, in supporting the continuing education of professionals engaged in transplantation, and in providing guidance to professionals on ethical practice. Contributing to the pursuit of self-sufficiency, TTS aims to provide a comprehensive education programme in the science and

clinical practice of transplantation, designed to improve patient outcomes through greater competence and performance of its members, the medical community, and the general community.

TTS acts as consultative technical body to its members and Sections, to national and regional societies and their country affiliates, to governmental and non-governmental organizations, to related international societies such as the Global Alliance for Transplantation, and to international organizations such as the WHO. In this capacity, TTS provides expertise in establishing deceased donor programmes and advises on standards of care for living donors. TTS actively supports the work of the WHO by implementing the resolutions of the WHA as they apply to the fields of cell, tissue, and organ transplantation.

A key mission of TTS is to take measures to protect the poorest and vulnerable groups from transplant tourism and the sale of tissues and organs, including attention to the wider problem of international trafficking in human tissues and organs. The Declaration of Istanbul arose from concerns shared by TTS, the ISN, and the WHO regarding the ongoing problems of international organ trafficking and the global shortage of organs for transplantation. TTS is now leading task forces that are systematically assisting professional organizations, scientific journals, pharmaceutical companies, patients, and governments with the objective of promulgating and implementing the Declaration of Istanbul. The mandate of these task forces is to:

- Reach colleagues through professional organizations and assist with practical implementation of the principles of the Declaration of Istanbul;
- Ensure all possible relevant organizations are contacted to facilitate communication with the Declaration of Istanbul Custodian Group (DICG) and provide suggestions regarding activities following endorsement;
- Communicate the details of the Declaration of Istanbul to national and institutional review boards, ethics committees, and ethics review organizations;
- Assist medical and scientific journals in (a) requesting that authors of articles relating to clinical organ transplantation disclose whether the clinical and research activities being reported conform with the principles of the Declaration of Istanbul, and (b) establishing editorial processes for determining the appropriateness of accepting presentations on clinical transplantation, based on the disclosure of their conformance with the principles of the Declaration of Istanbul;
- Communicate the details of the Declaration of Istanbul to sponsors and funders of clinical transplantation research;
- Integrate into all clinical transplantation trials, adoption of the Principles of the Declaration of Istanbul, alongside the Declaration of Helsinki and Good Clinical Practice Guidelines;
- Respond to knowledge about individual patients subject to transplant tourism, commercialism, and trafficking;
- Promote the welfare of individual donors and recipients in the global environment;
- Provide an annual report on regional and national organ trafficking and tourism and other developments related to the Declaration of Istanbul (such as

- new legislation, criminal proceedings against transplant centers, and professionals);
- Coordinate the work of DICG Emissaries through defining their terms of reference, collating information from the Emissaries and providing communication to the DICG;
 - Engage governments to endorse principles of the Declaration of Istanbul and to persuade them of the value of incorporating the principles into clinical practice;
 - Distinguish actions required by Governments both with and without transplantation services with respect to both citizens and foreigners;
 - Communicate with Ministries of Health and emphasize the role of the Declaration of Istanbul as a professional ethical standard fully consistent with the WHO Guiding Principles for Human Cell, Tissue, and Organ Transplantation.

In addition, TTS is currently undertaking efforts to collect data concerning cross-border transplant procedures, to ensure that these are regulated and comply with agreed quality and safety standards. TTS, along with its Sections, associated agencies, and members, has a central role in the pursuit of self-sufficiency and is committed to provide ongoing leadership in working toward this goal.

The Critical Pathway: the Process of Donation From Deceased Donors

Francis Delmonico

Director of Medical Affairs, TTS

A structured deceased donor management algorithm is a useful tool by which countries with existing deceased donation programmes may evaluate performance in the utilization of possible deceased organ donors. It also provides a framework for policy in countries seeking to develop effective transplantation programmes from the ground up. A critical pathway for organ donation is presented in Figure 2. The essential features of this critical pathway are as follows:

- A possible deceased organ donor is a patient with devastating brain injury or lesion or a person with a circulatory failure, who is apparently medically suitable for organ donation. The critical pathway is designed to retrospectively, and prospectively, consistently assess this specific patient population. Patients may only become donors after death, and organ recovery must not cause death. The identification and referral of a possible donor is the role of the treating physician.
- DBD and DCD are both to be considered under the critical pathway.
- DBD: on recognition of a possible deceased donor by the treating physician responsible for the patient, the possible donor becomes a potential donor when his or her clinical condition fulfills death by neurologic criteria. Once the potential donor is declared dead, he or she is considered an eligible donor if medically suitable for organ donation. An actual donor is a consented eligible donor in whom an incision has been made with the intent of organ recovery or an organ has been recovered. If a malignancy is discovered during the operative procedure (or any other contraindication to organ donation is noted), the organ recovery procedure may be discontinued. The patient may still, however, be categorized as a deceased donor. A utilized

donor is an actual donor from whom at least one organ has been transplanted into a recipient.

- DCD: a potential DCD donor is a person for whom the withdrawal of life support is planned because further treatment would be futile; yet brain death has not occurred, usually because the patient is spontaneously taking a breath. After the withdrawal of life support, the cessation of circulatory and respiratory functions is anticipated within a timeframe (up to 2 hr) that will enable recovery of a viable organ. If the patient does not die within that period, organ recovery is not performed. A potential DCD donor is also defined as the person whose circulatory and respiratory functions have ceased and resuscitative maneuvers are not to be attempted or continued. An eligible DCD donor is a medically suitable person who has been declared dead based on the irreversible absence of circulatory and respiratory functions as stipulated by the law of the relevant jurisdiction, within an appropriate timeframe that organ recovery is possible. The remainder of the critical pathway for eligible DCD donors is the same as for DBD donors.

Application of the critical pathway algorithm in clinical practice may identify specific reasons why a potential organ donor has not been converted into a utilized donor. Avoidable disruption of the critical pathway includes: (1) failure to identify a potential or eligible donor; (2) failure to complete brain death diagnosis because of lack of resources or personnel able to make the diagnosis; (3) failure to declare circulatory death within the appropriate timeframe; (4) logistical problems, for example, the lack of a recovery team; (5) inability to identify a compatible recipient; (6) damage to organs made during their recovery; (7) inadequate perfusion of organs or thrombosis; or (8) consent is denied by the donor or his or her family. An essential step in the critical pathway is the notification of organ donation personnel. Referral may occur when the pathway establishes a possible deceased organ donor, when a potential DBD or DCD donor is identified, or when eligibility of the potential DBD is established. Alternatively the family themselves may raise the possibility of organ donation.

The critical pathway for organ donation is a core outcome of the Madrid Consultation. Evaluation of the performance of organ donation and transplantation programmes should take account of this pathway and the goal of recovering as many organs as possible by converting possible and potential donors to utilized donors. There are some clear immediate barriers to this goal, for example, the fact that DCD is not legally accepted in some countries in Europe. Adoption of the clinical pathway in clinical decision making and its use as a reference for policy makers will facilitate the development of deceased donation programmes that optimize efficiency and efficacy in the recovery and transplantation of deceased donor organs.

Global Status Report on Organ Donation and Transplantation: Current Activities and Progress in the Pursuit of Self-Sufficiency

European Region

Valentina Hafner

WHO Regional Office for Europe

The European region is the global leader in organ donation from deceased persons. Of the 31,628 solid organ transplants reported in the region in 2008 (40.5 per million population), 85% were from deceased donors (7) (Fig. 5). Yet these figures conceal significant variation in organ donation and transplantation activity across the region; Europe encompasses both the highest performing deceased donor programme in the world (Spain), and multiple MS with no transplantation activity or infrastructure. Despite this variation, the pursuit of self-sufficiency in organ donation and transplantation is conceived as a shared European ambition. The WHO Guiding Principles (22), the EU's regulatory framework (23), and the protocols developed by the Council of Europe (24), guide consistency in European regulatory frameworks and processes and promote a common attitude toward transplantation issues. European cooperation is concerned mainly with the dissemination of best practice in regulated organ donation and transplantation environments, and protection of vulnerable populations and elimination of transplant tourism.

The provision of safe, effective, and sufficient transplantation services across the European region faces several challenges. Uneven health service development, and political, organizational, and cultural diversity across MS translates into differences in legislative backgrounds, variation in donor and recipient management, and differences in public perceptions toward organ donation and transplantation. This adds to potential epidemiologic threats (4) and pressure on health service delivery because of growing cross-border movement. The aim of European cooperation and collaboration in the development of professional capacity, galvanization of political will, and promotion of public awareness is, ultimately, to develop organ donation and transplantation programmes across the European region that maximize transplantation rates and are simultaneously based on understanding and respect of ethical principles, human dignity, and social justice.

Effective national legal frameworks consistent with the WHO Guiding Principles are essential component of

this goal. The promotion of organ donation and transplantation across the European region necessitates a public health perspective, to avoid potential distortionary impacts on national health priorities. Increased attention needs to be given to health promotion, disease prevention, early treatment, and diagnosis of conditions potentially leading to organ failure and other transplant needs, minimizing the gap between demand and availability.

The Chisinau Statement of 2009 (25) extends European collaboration and knowledge sharing on issues of quality, safety, and access to transplantation services, based on ethical principles and respect for human dignity, to the newly independent states of Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Tajikistan, and Uzbekistan. Most of these states now have specific transplant legislation, although not all have established a transplantation authority. As MS develop their national transplantation programmes, European collaboration is expected to provide ongoing support in the form of practical assistance and technical advice to ensure quality of care, regional networking, and opportunities for regular consultation to benchmark status, map progress, share concerns, and produce solutions.

African Region

Jean-Bosco Ndiokumbwayo
WHO Regional Office for Africa

Transplantation activity in the 46 MS of the African region is minimal and is typically confined to kidney transplantation from living donors. Activity in the 6 countries that conduct transplantation (Algeria, Kenya, Mauritius, Nigeria, Ghana, and South Africa) ranges from 305 organs transplanted in South Africa during 2008, to 1 kidney transplanted in Ghana (7). South Africa alone performs transplants from deceased donors, although Algeria is beginning to develop its own deceased donor programme. Demand for organs in the African region is great and is growing, driven by an increasing prevalence of chronic diseases, especially hypertension, and by the enormous regional burden of infectious risk factors for end-stage organ disease, including HBV and HIV. Coordinated, sustained approaches to the prevention of noncommunicable diseases (NCDs) in the region are absent, reflecting low awareness and minimal allocation of funds to support prevention efforts (26). Therefore, the gap between demand and capacity to provide transplantation is rapidly widening.

The scarcity of transplantation in Africa corresponds with the limited capacity of health systems in the region to deliver resource-intensive transplantation programmes. Additional barriers to provision of transplantation in the African region include the lack of access to affordable immunosuppressive drugs and to adequate diagnostic services, including imaging, pathology, and histocompatibility laboratories. Such challenges are compounded by an absence of oversight and regulation of organ donation and transplantation activities, and a legislative and regulatory vacuum that leaves populations vulnerable to exploitation. Low- and middle-income countries constitute easy targets for the exploitation of poor and vulnerable individuals when they lack legal protection. The magnitude of these

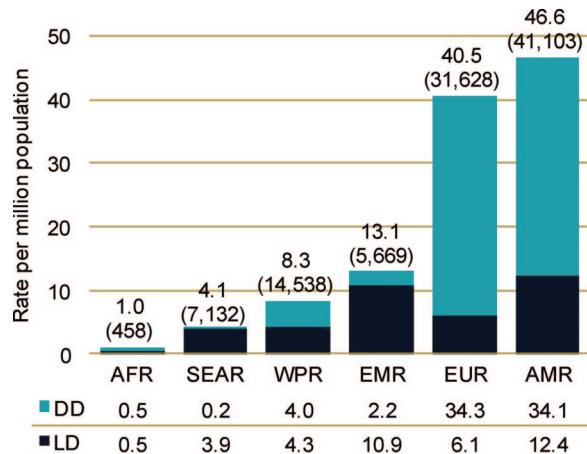


FIGURE 5. Distribution of transplantation activities in each World Health Organization region in 2008. Proportions attributable to deceased donors (DD) and living donors (LD) are shown. Value labels give overall rate (absolute transplants performed).

Country study: Russian Federation**Sergey Gautier***Director, National Research Center of Transplantology and Artificial Organs President, Russian Transplantation Society*

Despite the introduction of a Federal Transplantation Law based on the WHO Guiding Principles for Human Cell, Tissue and Organ Transplantation and adoption of presumed consent in 1992, and the availability of a legal definition of brain death since 1987, organ donation and transplantation in the Russian Federation remained at a critically low level until 2006. The annual rate of kidney transplantation did not exceed 3.0 per million population, and for other organs, the transplantation rate did not exceed 1.0 per million population (27, 28). However, a number of organizational, legislative, economic, and educational changes have resulted in recent positive trends in transplantation rates.

Russia has 34 transplant centers located in 19 cities, of which 33, 8, 5, and 3 perform kidney, liver, heart, and pancreas transplantation, respectively. Almost all transplant centers are located on the European side of the country; therefore, organ donation and transplantation activity occurs in only 14 of 84 regions in the Federation. Furthermore, it is the 41.6 million residents of these 14 regions (29.3% of the total population) comprise the potential deceased donor pool for the entire country. The mean rate of donation from deceased persons in these 14 regions is 8.8 donations per million population, decreasing to 2.6 donations per million population when the whole population is considered.

From 2006 to 2008, there was a marked increase in the deceased donor rate in these 14 regions. The total number of utilized deceased donors reached 381 in 2009, an increase of more than 60% since 2006 (27). There was also a 39% increase in the 12 months from 2008 to 2009 in the number of living kidney and liver transplants. Contributing to increases in the rate of donation from deceased persons has been increases in the both rate of brain death diagnosis and in the rate of multiorgan procurement. A lack of extrarenal transplantation programmes in the majority of transplant centers, however, has meant that multiorgan procurement has already begun to plateau. DCD accounts for approximately 50% of kidney transplants.

There is a need for greater popularization of organ donation in the Russian Federation, for dissemination of information about the process of organ donation, and for public reassurance concerning the successful results of transplantation procedures. The Federation consists of 500 different nationalities, each with individual cultural attitudes toward organ donation, and therefore, engagement with religious and other community leaders is necessary to overcome a widespread lack of awareness concerning organ donation and transplantation in the population. Poor awareness and information extends to medical professionals; medical education needs to be improved to provide specific teaching on principles of organ donation, organ procurement, and organ sharing. There is also a need to settle unresolved legal questions and to improve regulation and coordination at the federal level. The Russian Transplantation Society is working with the developing a federal transplant coordination system and nationwide database and registry. Pediatric deceased donation and informed consent for parents remains an unsettled legal area.

Despite recent improvements, transplant activity in the Russian Federation remains vastly insufficient compared with population needs. There is a significant and unrealized potential of donation from deceased persons, meaning that the preconditions exist for considerable growth of solid organ transplantation with greater development of regional and federal coordination systems for organ donation and transplantation. Key challenges in the pursuit of self-sufficiency will be to extend organ procurement to include a greater proportion of the population and to build support for organ donation and transplantation among medical professionals. ■

problems in the African region is not well known, consistent with a general opacity surrounding regional activities, practices, and outcomes in organ donation and transplantation in the absence of reliable data.

Collaboration between African countries, or between Africa and other regions/international agencies, for the purpose of enhancing knowledge, skills, and resources, is currently limited. Greater regional and international collaboration and cooperation might contribute meaningfully to the future of organ donation and transplantation in the African region by: (1) providing technical support and training; (2) supporting efforts to identify affordable drugs, equipment, and consumables; (3) consulting on oversight, organization, and coordination of organ donation and transplantation programmes; and (4) facilitating regional cooperation in the development of deceased donor transplantation. Development of greater expertise in the practice of transplantation and increased resourcing of transplantation services in African countries with existing transplant programmes have the potential to produce ancillary benefits for the health services, including improvements in pathology and imaging services, surgery, and gen-

eral medicine, while also contributing to improved quality of medical education and of tertiary care at large.

Few countries in the African region have established specific transplantation legislation under national health laws or any form of regulatory oversight with respect to organ donation and transplantation. Currently, 5 of 46 MS in the African region have transplantation legislation in place (South Africa, Algeria, Mali, Senegal, and Côte d'Ivoire). Hence, the African region faces the simultaneous challenges of a large vulnerable population lacking legal protection from exploitation, an expanding population in need of organs, and an absence of many of the essential services necessary to meet minimal standards for the provision of transplantation services. Although the extent of organ trafficking and related forms of exploitation in the region is unknown, the combination of these factors has potential to jeopardize patients, medical teams, and transplantation services. There is therefore a critical need for improved regulation and oversight of all aspects of transplantation in the region, so that risks to patients and communities may be controlled. For African countries, the first steps toward self-sufficiency will be to raise political

Country study: Nigeria

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Nigeria is the most populous country in West Africa, with a population of 150 million, comprised predominantly of young adults. Communicable diseases, particularly tuberculosis, malaria, and HIV, are highly prevalent. Like most countries in the region, Nigeria faces a concurrent, growing burden of noncommunicable disease. Hypertension is found in approximately 10% of adults, and rates of diabetes mellitus are increasing (29). Community-based studies estimate a prevalence of chronic kidney disease as high as 18% to 20% (30), and there has been a surge in the representation of chronic kidney disease among hospital admissions over recent years (21, 24 Arogundade and Barsoum 2008).

Hypertension is the biggest single cause of chronic kidney disease in Nigeria, as in most of sub-Saharan Africa, followed by glomerulonephritis (including secondary glomerulonephritis related to malaria, HIV, filariasis, schistosomiasis, HBV, HCV, and SLE). Currently, only approximately 5% of chronic kidney disease is attributable to diabetes mellitus (26). Other contributing risk factors include analgesic intake, the use of herbal and alternative medicine, poor access to health care, and a reluctance to seek out health services. End-stage kidney disease in Nigeria is predominately a disease of young adults (30–40 years) from low socioeconomic background. Presentation is typically late in the course of disease progression and is accompanied by a high comorbidity burden (31). Poor access to treatment means mortality is more than 95% (32).

Primary health care in Nigeria provides free immunization and basic services, including maternal/child health care, subsidized by the government. Tertiary health care is available in specialist/teaching hospitals located near major cities. Government funds cover staff and equipment only; all costs of treatment are covered by the patient. Nigeria has had a national health insurance scheme for about 5 years, which covers less than 1% of the population for primary and some secondary care services, but not for tertiary services such as dialysis or organ transplantation. Nonetheless, the provision of dialysis services through both public and private facilities has seen rapid growth in recent times. The maintenance dialysis population in Nigeria is estimated to be between 500 and 600 patients; however, this reflects only 5% to 10% of population of patients actually requiring dialysis (>6000). These are patients who are able to afford more than 2 months of dialysis through personal funds or sponsorship by government agencies or private organizations. Prevention programmes targeted at the causes of end-stage organ disease currently do not exist in Nigeria. Strengthening primary health care to include detection of chronic disease risk factors for the prevention of chronic disease and end-stage organ failure is an important goal. Adequate population studies and national registries are also needed to generate reliable data on end-stage organ failure and its treatment.

Transplantation activities are confined to a small programme based on living donors. Kidney transplantation was commenced in 2001, and Nigeria now has 4 transplant centers with a combined capacity to perform approximately 30 to 40 transplants per year. More than 90% of transplanted organs come from living related donors, and first year survival of patients transplanted in Nigeria is approximately 95%. In 2008, total transplantation activity consisted of 14 kidney transplants from living donors. Transplantation facilities, equipment, and trained personnel are severely limited, as are diagnostic services and expertise. The huge cost of medications and laboratory and radiologic investments adversely affect the quality of immunosuppression, ongoing graft management, and patient management and workup. Legislative and regulatory frameworks are absent, as are competent authorities responsible for oversight of transplant activities, practices, and donor and recipient outcomes.

The expansion of transplantation activity in Nigeria depends on addressing these regulatory and resource deficits. Public-private partnerships for sustainable financing of transplantation services are needed. Financing needs also to provide for subsidization of individuals unable to afford the expense of transplantation, to promote greater equity access to treatment. Expansion of national medical insurance may also be appropriate. Regional and international collaboration has an important role in building technical capacity and in the development of deceased donor transplant programmes in Nigeria. Finally, increasing population awareness of organ donation and transplantation is necessary to support organ procurement and to address adverse sociocultural attitudes regarding medical intervention, which can lead to delayed presentation and difficulties for graft maintenance. ■

awareness of these challenges and to sensitize national authorities to the critical importance of legal frameworks, based on the WHO Guiding Principles.

Eastern Mediterranean Region

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WHO Regional Office for the Eastern Mediterranean

The Eastern Mediterranean region, extending from Afghanistan to Morocco and including some African countries with complex emergencies such as Sudan, Somalia, and Djibouti, is full of diversity. Concerning organ donation and transplantation, challenges for the region include unevenly distributed wealth, and consequently healthcare infrastructure, minimal interest in prevention of chronic disease, and low awareness among medical professionals and communities re-

garding the importance of organ donation. Donation after death is rare because of social reservations and ongoing debates surrounding brain death; therefore, transplant activity in the region predominantly involves kidney and partial liver transplants from living donors. Waiting lists for organ transplantation are growing rapidly, but in the absence of significant investment in transplantation services or access to organs from deceased donors, many patients have sought alternative solutions in the form of commercial transplantation. The region contains countries with significant problems in terms of organ trafficking, both documented and undocumented; wealthy individuals who need organs for transplantation import the vendors from poor MS. The WHO, with the cooperation of dedicated individuals in the field, has been able to introduce legislation against this practice in a few MS and is very proud of the results. Implementation is yet to follow.

Country study: Egypt

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Egypt commenced living donor kidney transplantation in 1980, introducing liver transplantation from living donors in 2002. An extremely high burden of end-stage liver disease and hepatocellular carcinoma is found in the Egyptian population. It is estimated that 42,000 individuals are currently in need of a kidney or liver transplant [vs. 1280 transplants performed in 2008; (7)]. The national government has introduced a comprehensive primary prevention strategy to control the spread of HCV; however, it is estimated that the number in need of transplants will exceed 100,000 by 2020 years based on the current population burden of HCV infection.

Disagreement over the definition of brain death, questions of social injustice, and ethical debates concerning the ownership of organs prevented the legalization of donation after death in Egypt until 2010. As the only hope for Egyptian patients with end-stage organ failure of disease has helped to inflate the problem of a compatible living donor, the large, unmet burden of disease has helped to inflate the problem of commercial organ sales in the country, and Egypt has become a regional hub for organ trafficking.

The passing of a transplantation law prohibiting organ trafficking, legalizing donation from deceased persons, and coordinating donation from living persons by the Egyptian Parliament in March 2010 represents a significant step both toward addressing the transplantation needs of the Egyptian population and bringing an end to wide spread trafficking. The Egyptian law stipulates that a License for Organ Transplantation will only be issued to adequately equipped facilities that are able to comply with strict standards and adhere to rigorous inspections from the High Committee of Organ Transplantation. It is intended that this new legal framework will be the foundation of an organ donation and transplantation programme characterized by transparency, legality, donor and recipient safety, equity in access to transplantation therapy, and a national culture of organ donation.

In 2010, Egypt is at a crossroads in organ donation and transplantation. Immediate challenges are to establish organizations responsible for organ procurement, construct a formal waiting list, and begin to generate community support for donation after death. Subsequent needs include the articulation of organ allocation criteria, construction of a donor and recipient registry, building depth of experience in brain death diagnosis, and the promotion of an organ donation culture within the health system. ■

Responding to the obligations of WHO MS with respect to effective national oversight, accountability, and the protection of vulnerable groups from transplant tourism (WHA 57.18/2004) is an important challenge facing the Eastern Mediterranean region. Prevention of an international trade in organs has been gathering momentum, including significant recent progress in instituting regulatory and legal frameworks consistent with The Declaration of Istanbul. Saudi Arabia, Kuwait, Tunisia, and Morocco have led the region in the regulation and technical development of organ donation and transplantation. In March 2010, transplantation law was also passed in Egypt. This law bans the commercial trafficking of organs, restricts donation from living persons to family members, permits regulated deceased donation, and undertakes to finance transplant procedures for low-income patients. Also in March 2010, President Asif Ali Zardari of Pakistan signed into law a bill prohibiting the sale of organs and providing for organ donation to occur after death (<http://www.emro.who.int/pressreleases/2010/no2.htm>).

Antipathy toward donation after death has been a major challenge in the Eastern Mediterranean region. Religious leaders are now leading normative change and building community support for donation after death by advocating organ transplantation, from both living and deceased donors, as being upheld by the Quran as a charitable and life-saving act. Registration as a potential deceased donor is being encouraged on the basis of religion, motivation to be a participant in a responsible society, and a responsibility to contribute to greater equity by increasing the donor pool, so that access to transplantation is possible across all sectors of society (a rejection of an allegorical notion of "pharos and slaves"). Donation from deceased persons is currently performed in Tunisia, Iran, Saudi Arabia, Lebanon, and Kuwait, with these countries soon to be joined by Egypt and Pakistan. Syria and

Iran are also now moving toward expanding deceased donation programmes.

The foundations are in place for unprecedented national efforts to maximize organ donation from deceased persons in the Eastern Mediterranean region. These efforts will be met by ongoing challenges of regulation, organization, and coordination, and by the need to firmly establish public awareness and community support through ongoing campaigns and effective media engagement. Appropriate models of organization and financing need to be developed that incorporate public and private healthcare providers in locally appropriate, regulated organ donation and transplantation systems that are transparent and acceptable to the community. Procedures for evaluating and making determinations on new developments of legal, ethical, or religious concern, for example DCD, may also facilitate the continuing advancement of deceased donor programmes within the region.

South East Asian Region

Mehta Geeta

WHO Regional Office for South-East Asia

The South East Asian region is home to approximately 25% of the world's population and approximately 30% of the global burden of disease. Communicable diseases, especially tuberculosis and HIV, are highly prevalent. However, it is chronic diseases—CVD, cancer, chronic lung disease, and diabetes—that are the leading cause of death in the region. This dual chronic and infectious disease burden is compounded by high neonatal and maternal mortality, and by the complex challenges of emerging diseases such as endemic avian influenza. Epidemiologic data on end-stage organ failure for the region is sparse. India (33) and Thailand (34) report an incidence of end-stage kidney failure of approximately 150 to 175 cases per million population per year, higher than the incidence of end-stage kidney disease re-

ported by most European countries. Glomerulonephritis and interstitial diseases, associated with communicable diseases and environmental toxins, were historically the most common causes of end-stage kidney failure in the South East Asian Region but are now being taken over by diabetes, which is rapidly emerging as the single most common cause of kidney failure in the region (33, 35).

Of the 11 South East Asia region MS, six (Indonesia, India, Thailand, Sri Lanka, Myanmar, and Nepal) are currently engaged in transplantation activity and have national plans for organ donation and transplantation programmes at varying stages of implementation. More than 220 health facilities in the region perform solid organ transplantation, of which 65% are in the private sector. Approximately 7000 kidneys, 300 livers, and 10 hearts are transplanted each year, with the majority of this activity taking place in India, followed by Indonesia, Thailand, and Sri Lanka (7). However, 94% of kidneys and 70% of livers transplanted in South East Asia are obtained from living donors. Thailand alone has a significant deceased donation programme. The high burden of end-stage organ disease in South East Asia, combined with undeveloped deceased donation programmes, together contribute to a vast disparity between the need for organs and access to transplantation in the region and tempt unethical practices. Although the majority of MS have established legal frameworks regulating donation and transplantation, commercialization and trafficking continue to be reported.

The pursuit of greater self-sufficiency in organ donation and transplantation for the South East Asian region first requires that national plans for organ donation and transplantation programmes be extended to include the development of deceased donation. As in other regions, the successful expansion of organ donation and transplantation programmes relies on widespread community awareness of the importance of organ donation and participation as registered donors. It will be necessary to build on legal frameworks to ensure adequate regulation of all donation and transplantation practices and to combat the persistence of unethical practice in the sector. Finally, public-private partnerships should be promoted as an appropriate and sustainable method of financing organ donation transplantation in emerging economies, able to promote greater equity in access to transplantation by persons in need.

Western Pacific Region

Gayatri Ghadiok

WHO Regional Office for the Western Pacific

Of the 27 MS of the Western Pacific region, 10 have transplantation facilities (Australia, NZ, China, Korea, Viet Nam, Philippines, Japan, Mongolia, Singapore, and Malaysia). Organ donation and transplantation involving foreign donors and recipients traveling for this purpose is permitted by some countries in the region, although this is closely regulated. The Western Pacific is highly heterogeneous with respect to economic development, accounting for much of the variability in the distribution of transplantation activity, although this variation also presents opportunities for countries seeking to develop organ donation and transplantation programmes (most recently Fiji) to draw on long-established regional expertise in transplantation.

Significant heterogeneity is also found with respect to the utilization of organs from deceased donors in the Western Pacific region. Transplantation in Viet Nam, Mongolia, Philippines, Japan, the Republic of Korea, and Singapore is based predominantly on organs from living donors. Only in Australia, New Zealand, and China, do deceased donors outnumber living donors. The shortage of organs from deceased donors is a key challenge in the pursuit of self-sufficiency in the Western Pacific region. Despite high economic development and long-established transplantation programmes, Australia and New Zealand achieve rates of deceased donation consistently below the global average (39). In Japan, where the burden of end-stage kidney disease is among the largest in the world (34), debate concerning the definition of brain death has impeded the development of deceased donation. Other donation-related issues that present ongoing challenges in the region include allocation processes, traceability of organs, and transparency of procurement and transplantation. There is a scope for greater regional cooperation, including collaboration to share technical capacity and to meet training needs, improved laboratory coordination, and development of common quality and safety systems. Registries and databases for donor matching, surveillance of adverse events, and monitoring of organ donation and transplantation activities are well-established in some MS but underdeveloped in others. Finally, a tacit community acceptance of transplant tourism and commercial organ transplantation exists that has not yet been adequately addressed through legislative and regulatory frameworks.

Greater self-sufficiency in organ donation and transplantation in the Western Pacific requires principally that national legal frameworks be strengthened and implemented, consistent with the WHO Guiding Principles for Human Cell, Tissue, and Organ Transplantation, and that deceased donation programmes be developed as a matter of priority.

American Region

José Luis Di Fabio

WHO Regional Office for the Americas

Transplantation activities in the American region are highly variable. Rates of organ donation from deceased persons range from 6.29 deceased donors per million population for Latin America as a whole to 26.3 donors per million population in the United States. Within Latin America, there is a large diversity in transplantation activity, influenced by variability with respect to economic factors, political commitment to transplantation programmes, and the organization of healthcare systems. Countries that have had the benefit of continuous government commitment to organ donation and transplantation programmes, such as Uruguay, Chile, Columbia, Cuba, Argentina, and Brazil, demonstrate the highest rates of organ donation and transplantation in the region, and have shown systematic, ongoing improvements for the past 5 to 10 years (43, 42).

Latin America serves as a model for international cooperation and collaboration in the sharing of knowledge, skills, and resources. Training of transplant coordinators from Latin American countries by Spain in the early 90s established a precedent of Iberoamerican cooperation for the development of donation and transplantation programmes in Latin America. This exchange of knowledge and skills has been progressively formalized, and in 2005,

Country study: Thailand**Visist Dhivat***Thai Red Cross Organ Donation Center*

Thailand's Organ Donation Centre was established under the Thai Red Cross Society in 1994. Founded in 1893, the Thai Red Cross Society is the oldest, non-governmental, non-profit organization in Thailand. In addition to overseeing organ donation and transplantation activities, the Thai Red Cross Society is responsible for the National Blood Bank and Eye Bank. These organizations, with a common goal of obtaining cells, tissues and organs for transplantation, also share common laboratory support in HLA typing and microbiology.

The policies of the Organ Donation Centre have been developed in accordance with recommendations outlined by the Thai Medical Council, the WHO Guiding Principles, and the ethics committee of The Transplantation Society. These governing policies are; first, to promote an understanding of organ donation after death among the public and health professionals to have enough organs for transplantation in the country; second, to allocate organs fairly and without financial gain; and third, to optimize efficiency in the utilization of donated organs. The specific functions of the Centre incorporate almost all aspects of the organ donation and transplantation process, including maintenance of an organ donation registry and a national waiting list, organ matching and allocation, organ preservation and transport, coordination between donors and recipient hospitals, donor family care, increasing public awareness of the critical need for organs, and maintenance of a Heart Valve Bank (36–38).

The Organ Donation Centre has been responsible for extensive public awareness campaigns to promote understanding and greater support for organ donation and transplantation in Thailand. Multimedia campaigns, employing film and television advertising, print media, television programming, celebrity endorsements, poster campaigns, handbills, lecture tours, and exhibitions, have been used in the effort to raise awareness and to address specific topics such as brain death, organ donation and Buddhism, the shortage of available organs, the process of organ donation, and the efficacy of transplantation. In addition, the venerable Buddhist monk Phra Phromkunaporn (Prayuth Payutto) has written on the merits on organ donation to address misconceptions regarding donation and transplantation in the predominantly Buddhist Thai population. Events have been used to raise the profile of organ donation, including "The Organ Donation Day," an annual event during which the Organ Donation Centre organizes religious ceremonies to honor donors and publishes a booklet with words contributed from recipients and from donors' families. Private enterprises have also contributed to awareness campaigns, producing phone cards, and stamps printed with messages affirming the value of organ donation.

The Organ Donation Centre also provides training in transplant coordination, donor management, and organ recovery and conducts visits to provincial hospitals to educate professionals on the donation process and on the importance of transplantation. Education is also extended to medical and nursing students. Currently, Thailand has 638 transplant coordinators across 131 hospitals. The country has 31 kidney transplant centers, 10 liver transplant centers, and 5 heart transplant centers, of which 17 are located in private hospitals and 29 in government hospitals. However, although transplant waiting lists have more than doubled since 2001, the number of deceased donors has remained less than 100 per annum, fluctuating according to changes in public confidence and disturbances in healthcare operations affecting organ donation (36–38). There is approximately an 80% refusal rate from families approached regarding donation after death.

The major obstacles to improve the rate of donation after death in Thailand are the lack of an appropriate legislative framework, the lack of governmental and public health policies supporting organ donation and transplantation, poor awareness among medical professionals of the value of organ donation, and refusal of consent by families of potential donors. Solutions will require a commitment from the Ministry of Health to increase donation from deceased persons and the introduction of a legal definition of brain death as a priority. ■

the XV Iberoamerican Summit of the Heads of State and Government ratified a proposal to create the Red/Consejo Iberoamericano de Donación y Trasplante, with the mandate to improve organ donation and transplant programmes in Latin America through international linkage with ONT and via promotion of intraregional cooperation and collaboration. Red/Consejo Iberoamericano de Donación y Trasplante has developed numerous recommendations for implementation at the national level and has also developed an ongoing human resources training programme (the Master Alianza). As of March 2010, more than 180 transplant coordinators from across Latin America had been trained in Spanish hospitals in all aspects of the coordination of organ donation and transplantation and had returned to their respective countries to apply their expertise.

Supported by a strong network of collaborations and an active exchange of information, experience, training, and resources, Latin America has managed to address many of the challenges that in other regions act as barriers to the effective delivery of organ donation and transplantation programmes. Recent years have seen several Latin American countries achieve considerable success in their organ donation and transplantation programmes. The existence of appropriate and effective legal frameworks in most Latin American countries, the emergence of strong national organizations for the promo-

tion, coordination, and regulation of organ donation and transplantation, the development of data registries, the systematic high-quality training of transplant coordinators, and an increasing equity of access to organ transplantation are enormous achievements for the region.

Key Points and Summary

A global overview of current activities in organ donation and transplantation demonstrates that, despite wide variation in health service capacity, legislative background and cultural perceptions relating to organ donation, the challenges confronting individual countries with respect to the pursuit of self-sufficiency are often shared in common. Although the characteristics of successful organ donation and transplantation programmes may differ from country to country, the factors essential for progress toward self-sufficiency are affirmed in all contexts, regardless of local realities.

Essential for every country is a commitment to: (1) reducing need through disease prevention and (2) establishing legislative frameworks based on respect of ethical principles, human dignity, and social justice. Profound social and economic changes in low- and middle-income countries, accompanied by rapidly changing patterns of diet and exercise, are promoting escalating rates of CVD, diabetes, and other chronic

Country study: Singapore**Anantharaman Vathsala***National University of Singapore, Department of Medicine*

Singapore conducted its first corneal transplant in 1964, followed by the first kidney transplant from a deceased donor in 1970 and first kidney transplant from a living-related donor in 1976. Legislation was introduced in 1973 in the form of the Medical Therapy, Education and Research Act and was followed by the introduction of the Human Organ Transplant Act in 1987, which subsequently has undergone several amendments reflecting developments of a scientific or social nature relevant to the Act. Transplantation law in Singapore provides for the removal of organs from the bodies of deceased persons for transplantation purposes and prohibits trade in organs. Presumed consent has been gradually phased-in, incorporating different sections of the population in a step-wise fashion. The 1987 Act provided for the removal of kidneys from persons who had died from accidents only and exempted Muslims and persons more older than 60 years from the provisions of the Act; in 2004, the Act was amended to allow organ donation from all deaths and to provide for liver, heart, and corneal in addition to kidney donation; in 2008, Muslims were included in presumed consent, and; in 2009, the upper age limit for organ recovery was removed.

There is now a recognized need for Singapore to focus on the development of "soft skills," to fully realize the potential of the country's established legislative framework and existing transplantation infrastructure. The "Live On" programme has been developed to address public education and community motivation, policy development and implementation, engagement of the government and public agencies, and in innovations in practice. Public awareness of the importance of organ donation is the target of an annual SGD1.5 million media campaign that involves the distribution of an information booklet to all households, the utilization of news media, and campaigns directed at youth (such as short story competition and use of social networking websites). There is evidence that this programme is having a positive effect on attitudes towards organ donation, with 64% of people surveyed responding that they now support organ donation more than they did before the roll-out of the programme.

Concerns for living donor welfare and for financial hardship incurred by donors and recipients have prompted a number of organizational and legislative developments in recent years. Singapore has established a Donor Care Registry to monitor the long-term health outcomes of all donors, for life. Counseling and education are provided to all potential living donors, who must also go through a "cooling off" period before proceeding with donation. Amendments have been made to the policies of national health providence fund (Medishield) to exempt living donors from exclusions or premium loading. In addition, the Human Organ Transplant Act has been revised to include provision for the defraying or reimbursing of (1) costs or expenses or loss of earnings directly attributable to organ donation and (2) costs for medical care or insurance protection incurred as a consequence of organ donation. The Singaporean National Kidney Foundation has established the NKF Fund for needy donors, which provides annual medical follow-up and insurance protection covering hospitalization and surgery, death, disability, and critical illness. At the same time, legislation prohibiting the buying or selling of organs is being widened to prohibit advertisements relating to buying or selling of organs and to introduce stricter penalties for organ trading syndicates and middlemen. Singapore's first organ trading case was prosecuted in August 2008, and ensuring ethical practice in organ donation and transplantation is a priority. Currently, a living donor organ transplant can only be carried out following the approval of the hospital's Transplant Ethics Committee.

The incidence of end-stage kidney disease in Singapore has remained stable at 150 to 175 per million population for the past decade. During the same period, however, the rate of kidney transplantation has also remained relatively static at 25 to 40 transplants per million population per year (40). It is hoped that comprehensive chronic disease prevention programmes will complement efforts to increase the transplantation rate by reducing rates of end-stage organ failure. Programmes include the Integrated Screening Programme, which screens for diabetes, hypertension, and hyperlipidemia in the general community, the Pre-Diabetes Intervention Programme, and the Chronic Disease Management Programme. The Pre-Diabetes Intervention Programme, in which individuals with impaired fasting glucose are referred to nurse educators for assessment, counseling, and follow-up, has already been shown to be effective in decreasing mean blood glucose level in programme participants. Therefore, backed by a detailed legislative framework, Singapore is pursuing a composite approach to self-sufficiency that places emphasis on both successfully reducing demand for organs and increasing the transplantation rate. ■

diseases. This epidemiologic transition will alter the nature of the demand for health services in those countries affected, with global implications for organ donation and transplantation. Where there is a high burden of end-stage organ failure, combined with undeveloped deceased donation and an absence of regulation, there is also the temptation of unethical practices. The importance of legislative frameworks, consistent with the WHO Guiding Principles, cannot be understated. However, it must be noted that regulation is ineffectual unless adequate resources are channeled into its implementation, which requires political commitment, and that legislation can only bring about the desired change when it is sanctioned by public attitudes. A need to engage communities to build awareness concerning the importance of organ donation and the benefits of transplantation was identified in all regions.

Finally, the current era in transplantation is seeing the beginnings of widespread international efforts to over-

come traditional cultural, legislative, and organizational barriers to the development of deceased donation programmes. There is a central role for international cooperation and collaboration in facilitating these efforts, through the sharing of knowledge, skills and resources, data sharing, training programmes, and advocacy on issues of shared concern. Increasing access to transplantation globally by maximizing donation from deceased persons, complemented by donation from living persons, through practices that respect society's values and universal human rights and principles, is central to future progress in the pursuit of self-sufficiency.

Closure of the Meeting and Closing Remarks

Participants agreed on adopting a Resolution stressing a national responsibility to meet the needs of patients with respect to organ transplantation, as guided by the WHO Guiding Principles for Human Cell, Tissue, and Or-

Country study: Uruguay**Inés Alvarez***Instituto Nacional de Donación y Trasplante*

Uruguay has some of the highest reported rates of end-stage organ failure in the American region but is also the highest performing country with regards to organ donation and transplantation in Latin America. Significantly, the majority of transplanted organs in Uruguay come from deceased donors (deceased donor rate of 19.1 donors per million population).

The first kidney transplant in Uruguay was performed in 1969; regulation of transplantation activity followed in 1971. Initial legislation defined consent and prohibited trafficking and commercialization, while subsequent amendments have addressed donation from non related, living persons, definitions of circulatory and brain death, and xenotransplantation (41). A nationally integrated health system provides universal healthcare coverage. Since 1980, access to transplantation has similarly been free and universal. Financing of organ donation and transplantation is based on regulated private systems with public assistance. Uruguay also established a separate national donor registry and tissue bank, responsible for typing and allocation, early in the development of their programme to facilitate quality control, and also to ensure transparency to the wider community. One of the strengths of Uruguay's organ donation and transplantation programme has been the incorporation of community values. There is a community perception of equity of access, real possibilities of transplantation, and transparency of allocation systems (41).

On this foundation, Uruguay has sought to increase rates of donation from deceased persons by aligning organ procurement practices with the Spanish model. Transplantation is governed by a publicly financed, national governmental organization, responsible for regulation, implementation of national policy, procurement management, and monitoring and quality control of organ donation and transplantation practices in Uruguay (Instituto Nacional de Donación y Trasplante de Células, Tejidos y Órganos, INDT). Since the introduction in 2000 of hospital-based transplant coordinators under INDT, actualized donor rates have more than doubled (42). In 2006, a quality assurance programme was introduced to analyze theoretical national capacity for deceased donation, to monitor donation and transplantation practices, and to evaluate for improvement. Recent emphasis has also been placed on improving professional awareness and on public education, promoting a donation culture across the community.

Uruguay has also benefitted from a strategic focus on regional cooperation and linkages, with Brazil and RCDIT in particular, and from an emphasis on specialist training and continuing medical education, reflecting the core values of the Uruguayan organ donation and transplantation programme: sharing, discussion, and consensus. Central to the pursuit of self-sufficiency in Uruguay are public education, the promotion of a donation culture, ongoing professional training in both the medical and communication aspects of organ donation and transplantation, and fostering of best-practice in the detection of potential donors. ■

Box 4**Common challenges in the pursuit of self-sufficiency**

From low-income countries to high-income countries, many of the challenges facing organ donation and transplantation are shared in common. Successfully addressing these mutual challenges will often involve similar strategies and in some cases will depend on international cooperation and collaboration. These common challenges are as follows:

- The growing demand for organs affects low-, middle- and high-income countries alike, with need far outstripping current transplant capacity in the majority of countries.
- The global burden of diseases contributing to end-stage organ failure is immense, and therefore, organ donation and transplantation efforts must be complemented by sustained and comprehensive public health approaches to the prevention of diabetes, hypertension, cardiovascular disease, HBC, HCV, and chronic pulmonary disease.
- Reliable epidemiologic data on rates of end-stage organ failure are not available; hence, appreciation of actual transplantation need is currently not possible.
- Registries for the purpose of monitoring organ donation and transplantation activities must be comprehensive and accurate. National surveillance systems that monitor adverse events in transplant recipients and complications in live donors are critical.
- A minimal set of legal provisions concerning the removal of human material for therapeutic purposes from deceased and living donors is essential to protect the vulnerable from exploitation; however, unregulated settings persist.
- Ongoing regulatory improvement is a requirement for all regions. National bodies responsible for oversight of organ donation and transplantation activities are commonly absent.
- Low-income countries are uniquely challenged to provide diagnostic services (imaging, pathology, and histocompatibility laboratories) and by the unaffordability of immunosuppressive drugs. International support is needed to address these issues.
- Achieving transparency in allocation practices and equity in access to transplantation is a challenge wherever there is disparity between the number of patients in need and the number of organs available for transplantation. It is particularly challenging in settings where inequity is entrenched within the broader health system.
- Financing of organ donation and transplantation must seek to make effective use of private and nongovernmental funds and public-private partnerships in a locally appropriate manner.
- Promotion of transplantation and the expansion of deceased donation must avoid distortion of existing health priorities in disease prevention and be commensurate with local realities.

Box 5**Shared goals on the pathway to self-sufficiency**

Repeatedly identified across all regions of the globe are a common set of factors essential to the successful pursuit of self-sufficiency in organ donation and transplantation. These are:

- Regional/international cooperation for the exchange of knowledge, skills and, resources.
- Political sensitization to the need for adequate legislative frameworks based on the WHO Guiding Principles for Human Cell, Tissue and Organ Transplantation.
- National regulation and oversight of organ donation and transplantation.
- Community awareness of the importance of organ donation and participation in efforts to increase rates of transplantation.
- A culture of organ donation within the medical community.
- Access to national and international databases that cover all aspects of organ donation and transplantation, from population need, to long-term donor and recipient outcomes.
- Processes for quality assurance, monitoring the gap between potential and achieved donation.
- Incorporation of community values in organ donation and transplantation programmes; normative change led by political, religious, and community leaders.
- International cooperation in specialist training and continuing medical education.
- Sufficiently transparent financing, organ procurement, and allocation processes that the public, as potential donors themselves, are satisfied that the system is not being used to generate financial rewards, and is otherwise free from unethical or inequitable practices.
- National and international commitment to prevention.

gan Transplantation, and acknowledging that meeting the needs of patients necessitates a comprehensive approach that addresses the conditions leading to transplantation from prevention to treatment. Strategies for the pursuit of self-sufficiency within individual countries should be adapted to the respective level of economic and health system development, with the pace of progress from one level of transplantation capability to the next commensurate with local resource availability and competing health priorities. Transplantation programmes should use resources obtained within a given country for that country's population or, when necessary, resources may be obtained by regulated and ethical regional or international cooperation.

This new paradigm advances a comprehensive strategic framework for policy and practice directed at the global challenges of an increasing incidence of chronic NCDs, a shortage of organs for transplantation, and unmet patient needs. From this perspective, donation and transplantation services are to be recognized as an integral component of the health system, rather than as a marginal, superspecialized type of tertiary care. The need to interact with next of kin at the time of death mandates that professionals and organizations involved in donation and transplantation services engage with the public on an ongoing basis to promote greater recognition and understanding of organ donation. Likewise, professionals involved in donation and transplantation must present themselves to the public as concerned for the health of all, not only the health of potential recipients, and demonstrate medical empathy as much as technical professionalism.

The consultation was officially concluded by Dr. José Martínez Olmos, General Secretary of Health of Spain, who underlined how the concept of self-sufficiency does not only stress the necessity to increase the availability of resources within a given population to meet transplantation needs but also the necessity to decrease actual transplantation needs within that population and to en-

hance cooperation between the different stakeholders involved.

From a public perspective, the pursuit of self-sufficiency relies on a communal appreciation of the value of organ donation after death. The concept of donating human body parts to save the life of another as a civic gesture is one that should be taught at school as a part of health education to decrease needs in transplants. The pursuit of self-sufficiency in organs for transplantation exemplifies the public health and community values of reciprocity and solidarity, whereas it is the only safe guard against the temptation of yielding to trade in human organs.

The consultation was officially concluded by Dr José Martínez Olmos at 14:35 on the March 25, 2010.

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