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## Evaluation of the Donor After Brain Death and Technique for Organ Procurement

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### Article info

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### Abstract

**Context:** Renal transplantation is the best treatment modality for replacement of lost renal function in patients with end-stage renal disease. Nevertheless, the gap between the number of kidneys available for donation and the number of patients waiting for an organ is increasing due to an increase in the number of patients with renal failure and, simultaneously, a shortage of kidneys for transplant.

**Objective:** To review the policies available for kidney donation.

**Evidence acquisition:** A review of literature was performed to describe the available policies. Rates of donation were compared according to the different policies for several Western countries.

**Evidence synthesis:** The classical donor type is the deceased heart-beating donor after brain death; however, shortage of organs forced the expansion of the criteria for donation. The concepts of expanded criteria donation and donation after circulatory death have been adopted more recently. Scores based on donor characteristics and histology criteria from kidney biopsies are also used to refine the quality of organs used for transplantation. Live donation is still marginal in many countries.

**Conclusions:** There is an urgent need to increase public awareness of kidney transplantation, to improve strategies to identify new potential donors, and to master the techniques of retrieving and preserving organs. Increasing live donation is also essential to overcome organ shortage.

**Patient summary:** There is an urgent need to increase public awareness of kidney transplantation, to improve strategies to identify new potential donors, and to master the techniques of retrieving and preserving organs. Increasing live donation is also essential to overcome organ shortage.

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### 1. Introduction

The scarcity of kidney donors remains a barrier to the spread of renal transplantation, which is generally considered the best treatment option for most patients with

end-stage renal disease. The number of patients waiting for kidney transplantation has increased, but the actual supply of organs is far from covering the current demands. Consequently, significant social and legal improvements have been implemented in different countries to increase

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public awareness of organ donation and to overcome cultural and religious obstacles.

Organ donation rates have traditionally been expressed as donors per million of population (pmp). Among the most dynamic countries in transplantation, some have relied almost entirely on living donation (eg, Japan), whereas others have used deceased donation (eg, Spain, Portugal, and Croatia). Nevertheless, in the majority of the countries, both forms of donation are routinely used in balanced practice [1].

Regarding kidney transplantation from deceased donors, the gap between the supply and the demand for kidneys is stabilized only in countries with a donation rate >40 pmp and has increased in countries with lower donation rates [2]. Higher donation rates occur in European countries: In 2013, Croatia reported 47.7 pmp, France reported 46.7 pmp, and Spain reported 46.1 pmp (Fig. 1). High deceased donation rates have been observed in European countries that adopted opt-out consent policies (eg, Spain, France, Portugal, Croatia, Austria, Belgium) [2]. In these countries, consent is presumed unless the person has specifically rejected donation before death. These rates contrast positively with those coming from countries with an opposed policy, the opt-in informed consent law

(eg, United Kingdom, Germany, Netherlands, United States, Canada). Donation policy, however, is not the only factor influencing donation rates. The donation process is influenced by other variables such as the incidence of life-threatening trauma and intracerebral hemorrhage, the availability of intensive care facilities, and the rapid identification and correct management of potential donors [1].

Additional measures such as donation after circulatory death (DCD) and the adoption of marginal and expanded criteria for deceased donors (expanded criteria donors [ECDs]) have been implemented to increase the kidney pool obtained from standard criteria donors (SCDs). Currently, DCD already represents >10% of the kidneys from deceased donors in some countries such as the Netherlands, the United Kingdom, the United States, and Canada [3].

Living donation makes an important contribution to kidney transplantation programs worldwide and has some advantages over deceased donation, as demonstrated by generally better functional outcomes. In Europe, living donor transplants compose 15% of all kidney transplantations [4] and represent nearly 40% in the United States [5,6]. Across Europe, however, living donation rates are extremely variable. In 2013, Turkey, the Netherlands, and

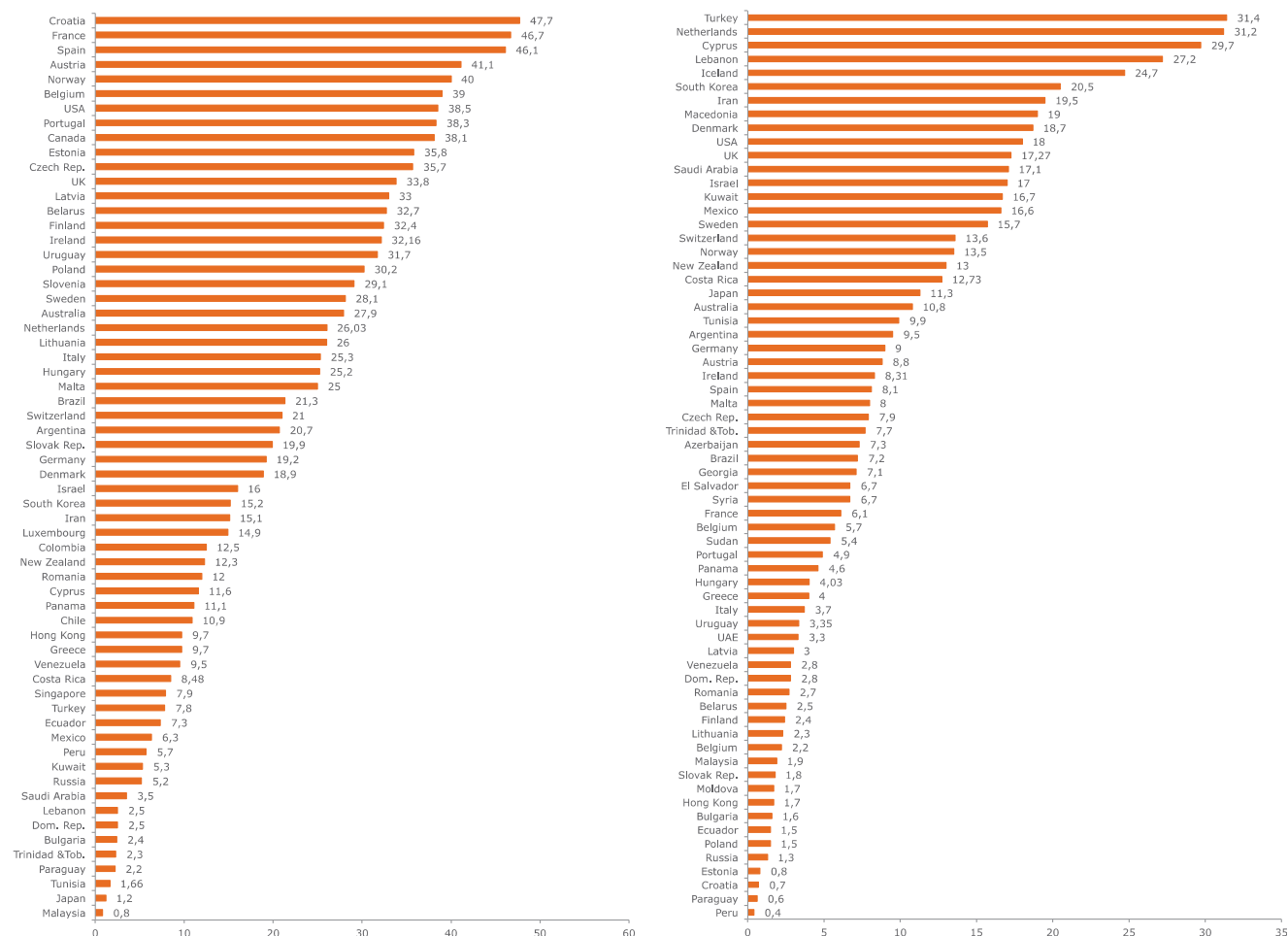


Fig. 1 – Worldwide kidney transplant from deceased donors (left) and living donors (right) in 2013 (per million of population). Reproduced with permission from the International Registry in Organ Donation and Transplantation [2].

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