

# Issue At A Glance:

## Kidney Transplantation in Developing Countries

*Over the past 30 years, the burden of chronic kidney disease (CKD), including end-stage kidney disease (ESKD), has increased globally. The best treatment for ESKD is transplantation, but accessing it in developing countries is not easy. This issue brief highlights existing challenges and recommendations for deceased donor transplantation programs in developing countries.*

### Introduction

Chronic kidney disease (CKD) affects ten percent of the population worldwide, and millions die each year because they do not have access to affordable treatment.<sup>1</sup> Everyone should have a fair opportunity to achieve their full health potential, but this is not so in many parts of the world due to disparities in access to healthcare, including transplantation.

When comparing developing and developed countries with similar population sizes, there are differences in incidences of end-stage kidney disease (ESKD) and rates of organ transplantation. In 2018, for example, Brazil reported 218 incidences per million population (pmp) of treated ESKD and performed 28.32 kidney transplantations pmp (13%), while the US had 395 incidences pmp and performed 69.3 transplantations pmp (18%). In that same year, Thailand reported 365 incidences pmp of treated ESKD and performed 9.68 kidney transplantations pmp (3%), while the UK had 120 incidences pmp and performed 55.15 transplantations pmp (46%).<sup>4,5</sup> These numbers highlight the discrepancies in transplantation rates and the need for more transplantation procedures to be performed, especially in developing countries.

### Key Milestones in Transplantation

- 1954** The first successful organ (kidney) transplantation was performed.<sup>3</sup>
- 1968** Brain death criteria were developed, paving the way for deceased donor transplantation.<sup>3</sup>
- 1995** The first living donor kidney was removed through laparoscopic surgical methods.<sup>3</sup>
- At Present** Over 80 countries routinely perform kidney transplants.<sup>2</sup>

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# Current Status and Challenges

## What is Happening Currently?

Brazil, a developing country, performs several deceased donor transplantation procedures. During the 2014-2018 period, approximately 79.2% of kidney donations (22,682) were from deceased donors.<sup>8</sup> Although Brazil performs many transplantations, several states do not have active transplantation programs, forcing patients living in those areas to travel long distances for access. Many other developing countries do not even have an active deceased donor program, and many patients cannot afford to travel to other countries to seek treatment.<sup>8,9,10</sup>

The Spain, Europe and the USA (SEUSA) program is a cooperation program to be implemented worldwide in an attempt to increase donation rates. This program is based on the successful models of Spain, Europe and the USA. This program was successfully implemented in Southern Italy (La Puglia), Lebanon, and Trinidad and Tobago. In these areas, brain death diagnoses increased, and donors also increased. Other countries could use this model to improve their donation and transplantation rates.<sup>13</sup>

## What are some of the Challenges?

Globally, there is a significant gap between the number of organs available for donation and the number of patients on the waitlist. As a result, many people die each year while waiting for a transplantation. Universally, there is a shortage of donated organs and limited medical, surgical, and nursing workforces with the required expertise to perform these transplantations, especially in developing countries.<sup>2,6</sup>

Many developing countries also face water shortage issues, poor access to clean water and sanitation, food insecurity, and poverty, among others, to a greater extent than developed countries. As such, allocating resources to fund transplantation programs proves even more difficult.<sup>7</sup>

## What is Brain Death and How is it Diagnosed?

Brain death occurs when a person on an artificial life support machine no longer has any brain function. It can be assessed by doing the following<sup>12</sup>:

- Physical Exam: checking response to pain and assessing brain stem reflexes
- Apnea Test: testing brain's ability to drive breathing in response to the rise of CO<sub>2</sub>
- Ancillary tests: testing for blood flow and electrical activity when diagnosis of brain death is uncertain



# Policies for Improving Organ Transplantation

The discrepancy between transplantation rates and incidences of ESKD highlights the need to establish more transplantation programs. Establishing and enforcing evidence-based policies that remove barriers to accepting deceased donor organs can increase the number of organs available for transplantation, and instituting systematic approach to organ procurement and allocation can also facilitate the transplantation process. The following are some components to keep in mind.

## Funding

In some developing nations, many ESKD patients die because the costs of kidney transplantation and dialysis are too expensive. To start and maintain a successful transplantation program, adequate and sustainable funding is crucial.<sup>11</sup>

## Brain death certification

When establishing a deceased donor program, hospitals must form a panel of doctors to certify brain death. No member of this team should participate in removing or transplanting organs to prevent any conflict of interest. This team should also draft documents for brain death certification that align with hospital policies and government regulations. Regular revision of these policies and debriefing after procedures are crucial to program success.<sup>10,14,16</sup>

## Developing an algorithm and rules for a transplantation list

Before procurement and transplantation can occur, rules that govern the waitlist, organ allocation, and patient registration must be developed. Creating a transplantation registry with details about each organ donor, transplantation candidate, recipient, and their post-transplantation outcomes can help to improve future procedures and policies.<sup>10,14</sup>

## Cytotoxicity testing for matching

Having an in-house or nearby crossmatch facility is important for tissue matching, blood typing, and viral screening to determine if the donor organ is compatible with the potential recipient.<sup>10,14</sup>

## Community education and outreach

Studies have shown that aggressive targeted outreach efforts to educate the population about organ donation improves the consent rate. A study done in Southern California showed that targeted outreach interventions resulted in a significant increase in consent rate among Hispanic Americans, from 56% in 2005 to 83% in 2011.<sup>15</sup>

## End of life care

The National Academy of Medicine in the US recommends giving patients and their families the opportunity to opt-in or out of organ donation as a part of end of life standard care.<sup>6</sup> Implementing this as a hospital policy can help to increase the number of organs available for transplantation.

## Conclusion

Given the progressive rise in ESKD cases each year worldwide, the demand for kidney donations has also increased. In countries where access to healthcare and transplantation is difficult, policymakers and health care institutions should develop policies and programs that increase funding, improve access, and expand education and outreach regarding deceased donor transplantation.

When creating new transplantation programs, the transplantation team must be well trained in organ procurement, transplantation, and grief counseling for the program to be successful. Better funding opportunities, improved process for brain death certification, and education of the community are crucial to increasing the number of deceased donors and transplantation procedures performed.

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## Did you know?

Approximately 98 organ transplantations take place every day in the United States. That is more than 36,000 people a year!<sup>17</sup>



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