

Pioneering the Future of Organ Transplantation: Lessons from the Spanish Model

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ABSTRACT

Spain has consistently demonstrated global leadership in organ transplantation, culminating in record achievements in 2024. With 6,464 transplants performed, including significant advancements in kidney, liver, and lung procedures, Spain reached a donation rate 52.6 per million population, surpassing international benchmarks. The success of the Spanish model is rooted in its progressive legislation, clinical leadership, and public awareness campaigns, fostering trust and solidarity. Technological innovations, such as extracorporeal membrane oxygenation (ECMO), and programs addressing complex cases, like PATHI and donation after euthanasia, have further positioned Spain as a reference for ethical and efficient transplantation systems. Recognized by the World Health Organization (WHO) and highlighted by *The Lancet*, Spain's transplantation model is a benchmark for equitable and transparent practices. This paper explores the pillars of its success, the innovations driving its impact, and the lessons it offers to the global community.

Keywords. Organ transplantation, Spanish model, donation rate, presumed consent, global health leadership, ECMO technology, ethical transplantation, World Health Organization (WHO), public awareness campaigns, and healthcare innovation.

In 2024, Spain reaffirmed its position as a global leader in organ transplantation, reaching milestones that reflect the effectiveness and strength of its healthcare system. With a record 6,464 transplants performed, this model exemplifies how innovation, trust, and social solidarity can be integrated to overcome global challenges. Globally, only 10% of the demand for transplants is met, highlighting the urgency of effective solutions such as those implemented by Spain ¹.

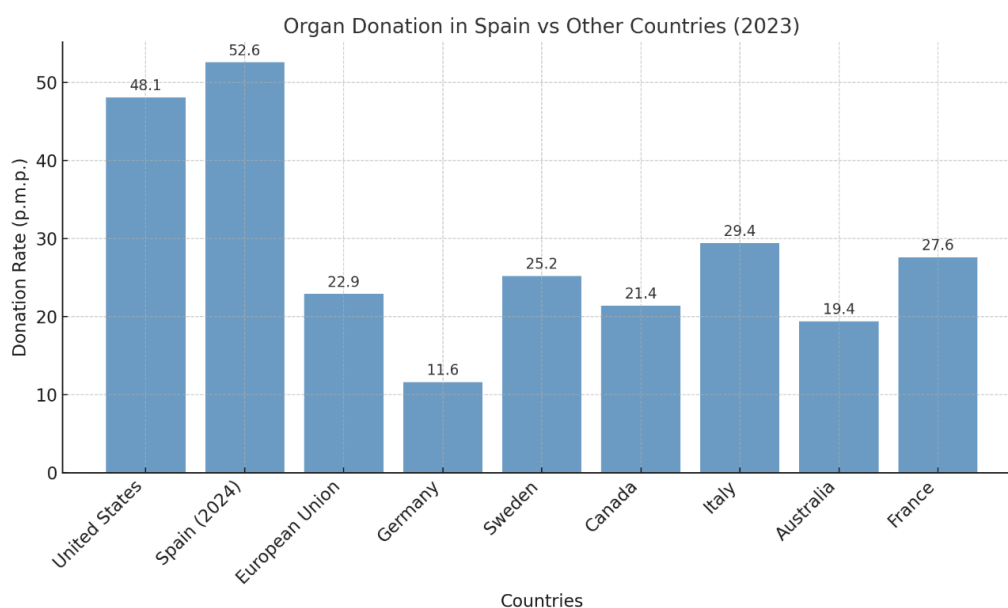


Figure 1: Comparison of organ donation rates in Spain and other countries (2023). The graph shows donation rates per million population (p.m.p.), highlighting Spain's leadership with a rate of 52.6 p.m.p., compared to the United States (48.1 p.m.p.), Germany (11.6 p.m.p.) and France (27.6 p.m.p.). Source: Global Observatory on Donation and Transplantation ².

Unprecedented Milestones in 2024

In 2024, Spain achieved an all-time record with 6,464 organ transplants, a 10% increase compared to 2023. These included 4,047 kidney transplants, 1,344 liver transplants, and 623 lung transplants, reflecting a 30% growth in the latter. The organ donor rate reached 52.6 per million population (p.m.p.), far exceeding the global average and surpassing countries such as the United States (48.1 p.m.p.) and the United Kingdom (22.4 p.m.p.)^{1,2,3}.

Technological advancements, such as extracorporeal membrane oxygenation (ECMO), enabled Spain to significantly increase transplants from donors after circulatory death, which accounted for 51% of all donations. Each day, an average of 17 transplants were performed in Spain, supported by approximately eight donors daily³.

Spain's "presumed consent" policy, which assumes everyone to be a potential donor unless they opt out, also contributed to its success. This approach and an 80% family consent rate reinforce trust and solidarity among citizens⁴.

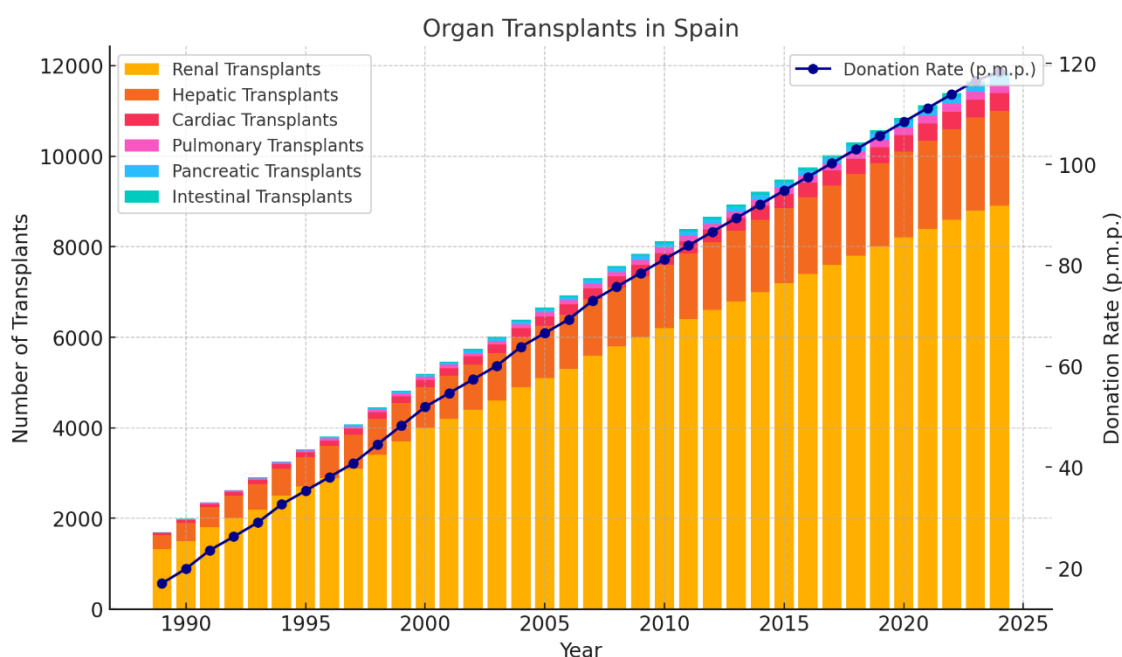


Figure 2: Trends in organ transplantation in Spain (1989-2024). The graph shows the number of transplants by organ type, including renal, hepatic, cardiac, pulmonary, pancreatic, and intestinal. The blue line represents the donation rate per million population (p.m.p.). Source: National Transplant Organization (ONT)¹.

Pillars of Success of the Spanish Model

The success of Spain's transplantation system rests on three essential pillars:

- **Progressive Legislation:** The 1979 Transplantation Act guarantees transparency and equity in organ allocation. Its continuous adaptation to medical advances and societal needs has broadened eligibility criteria and strengthened public confidence⁵.
- **Clinical Leadership:** Transplant coordinators, often intensive care physicians, identify potential donors, support families, and oversee the logistics of the process. Regional and national coordinators ensure the efficient and ethical distribution of resources^{1,5}.

- **Public Awareness:** Educational campaigns led by the National Transplant Organization (ONT), in collaboration with the media, have normalized organ donation, promoting its life-saving impact and fostering a culture of solidarity ⁴.

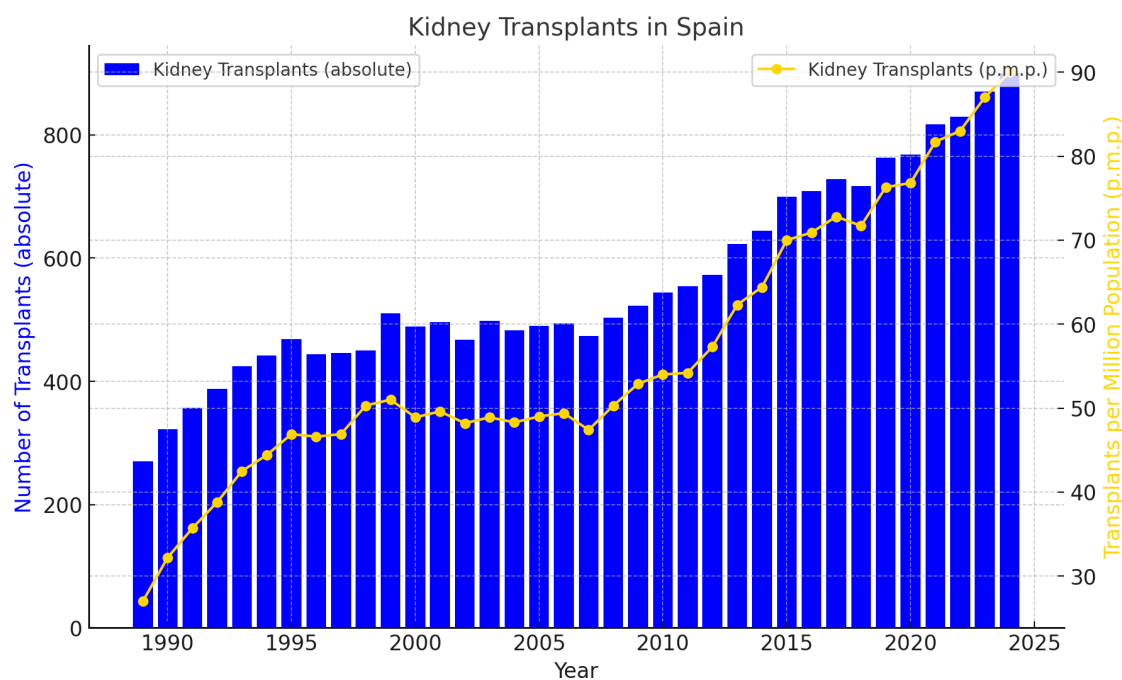


Figure 3: Trends in renal transplantation in Spain (1989-2024). The bar graph represents the absolute number of kidney transplants performed annually, while the yellow line indicates the rate of transplants per million population (p.m.p.). Source: National Transplant Organization (ONT) ¹.

Innovation in the Face of Challenges

Despite its achievements, more than 5,000 patients, including 73 children, were still on the waiting list for transplants at the end of 2024. To address this, Spain implemented innovative programs such as PATHI, which facilitated transplants for 140 highly sensitized patients and led efforts in donation after euthanasia, contributing to 442 transplants since 2021 ^{1,4}.

Spain's adoption of advanced technologies, including ECMO, and its exploration of ethical donation pathways have positioned it as a world leader in addressing complex transplantation needs ^{4,6}.

Global Impact and Lessons Learned

In 2024, Spain presented a global resolution at the World Health Assembly to increase the availability of transplantation and promote ethical practices, consolidating its influence on the international stage. This effort underscores the relevance of transparency, equitable access, and collaboration worldwide ⁴.

The World Health Organization (WHO) has recognized Spain's pivotal role in organ transplantation. In April 2024, the WHO highlighted that Spain, through its Ministry of Health, is crucial in improving the safety, quality, and accessibility of organ and tissue transplantation globally. Spain has been instrumental in supporting other countries in developing sustainable and self-sufficient transplantation systems ⁷.

Furthermore, at the 77th World Health Assembly in May 2024, member states approved a resolution, spearheaded by Spain, to enhance the availability and ethical regulation of human cell, tissue, and organ transplantation. This resolution focuses on expanding transplant access in low-resource countries and combating unethical practices, such as organ trafficking ⁸.

In September 2024, *The Lancet* highlighted the Spanish model for its emphasis on trust, ethical rigor, and international cooperation. This system demonstrates that a comprehensive and well-resourced approach can transform society, making organ donation an accepted and celebrated norm⁶.



Figure 4: Exterior view of the Hospital Universitario La Paz in Madrid, Spain, recognized for its excellence in organ transplantation and comprehensive healthcare. [Source](#)..

A Personal Testimony of Gratitude

I express my deepest gratitude to Spain for its extraordinary organ transplantation system, particularly to the Hospital Universitario La Paz in Madrid. I was privileged to be a recipient of this system and a direct witness to its excellence. The dedication, expertise, and compassion of the medical, nursing, and support staff were remarkable. From the surgical procedure to the meticulous follow-up care, every aspect demonstrated the highest standards of professionalism and humanity.

The Spanish organ donation and transplantation model, based on trust, innovation, and solidarity, highlights what a healthcare system can achieve when backed by a collective commitment to safeguarding lives. My experience with Hospital La Paz has restored my health and deepened my admiration for Spain's leadership in transplantation. Thank you for making a difference in my life and the lives of countless others.

CONCLUSION

The Spanish organ transplantation model exemplifies how a well-designed, innovative, and people-centered healthcare system can achieve global leadership and transformative impact. By integrating progressive legislation, clinical excellence, technological innovation, and a strong emphasis on public trust and solidarity, Spain has set new organ donation and transplantation benchmarks. Its record-breaking achievements in 2024,

supported by initiatives like ECMO and programs addressing complex needs, demonstrate the potential of a healthcare system that prioritizes equity, transparency, and ethical practices.

Spain's success offers valuable lessons for countries seeking to address the global shortage of organ donations, where only a fraction of demand is currently met. The Spanish model is a blueprint for advancing transplantation systems worldwide, recognized by international bodies such as the World Health Organization and celebrated in academic platforms like *The Lancet*. By sharing its expertise and fostering international collaboration, Spain saves lives domestically and inspires global efforts to make organ donation an accepted and celebrated norm. This journey underscores the power of collective commitment and innovation in addressing one of the most pressing challenges in modern medicine.

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