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Organ Transplantation in India (2020–2024): Status, Challenges & Need for a Comprehensive Management System

Executive Summary

India has seen a tripling of annual organ transplants over the past decade, driven by rising need and gradual development of regulatory frameworks. Despite progress, organ donation rates remain far below the requirement, resulting in thousands of lives lost every month to organ failure. This report offers a detailed view of recent transplantation trends, actual donation statistics, state and national disparities, and data-driven evidence highlighting the urgency for organ transplant management solutions.

1. Introduction

The **National Organ and Tissue Transplant Organisation (NOTTO)** is India’s principal agency for overseeing organ donation and transplantation policy, coordination, and data. Despite a robust living-donor program and advances in surgical technique, public awareness, infrastructure, and uniform access to transplant services remain challenges. This report presents statistics for the years 2020–2024, exploring demand, supply, and mortality gaps to underpin the urgent need for a national Organ Transplantation Management System (OTMS).

2. Organ Transplantation in India: Key Trends

2.1. Total Transplants Performed

Year	Total Transplants	Living Donor Transplants	Deceased Donor Transplants	Living Donors	Deceased Donors
2020	7,443	6,457	984	~6,457	351
2021	12,259	10,638	1,619	~10,638	552
2022	16,041	13,338	2,694	~13,338	904

Year	Total Transplants	Living Donor Transplants	Deceased Donor Transplants	Living Donors	Deceased Donors
2023	18,378	15,435	2,935	15,436	1,099
2024*	~19,500+	n/a	n/a	n/a	1,128

Source: NOTTO Annual Report 2023-24^{[1] [2] [3]}.

- **Growth:** The total annual transplants have more than tripled from 4,990 in 2013 to over 18,000 in 2023, making India the third-highest in absolute transplants globally^{[4] [2]}.
- **Milestone:** For the first time in 2023, India crossed 1,000 deceased organ donors in a year^{[5] [4] [2]}.

2.2. Transplants by Organ (2023)

Organ	Number of Transplants (2023)
Kidney	13,426
Liver	4,491
Heart	221
Lung	197
Pancreas	27
Small Bowel	8

- **Kidney and liver** form the vast majority (approx. 97%) of all solid organ transplants in India^{[4] [2]}.
- Among kidney and liver donors, **living-related transplants** are predominant, reflecting India's strong living-donor program^{[4] [3]}.

2.3. Donation by Source and Demographics

- **Living Donors (2023):** 15,436 (9,784 female; 5,651 male)^[4]
- **Deceased Donors (2023):** 1,099 (844 male, 255 female)^[4]
- **Note:** Most living donors are female, while the majority of deceased donors are male, illustrating a significant gender skew.

2.4. State-wise Distribution

Deceased donation and transplantation are concentrated in a few lead states:

- **Top States (2023 Deceased Donors):** Telangana (252), Tamil Nadu (178), Karnataka (178), Maharashtra (148), Gujarat (146), Delhi (66)^{[1] [4] [2] [3]}
- **Regional Concentration:** Over 80% of deceased donations occurred in these five states^[3].

High-performing states dominate the organ donation ecosystem, while large regions—including populous states—lag in both awareness and infrastructure.

2.5. Demand vs. Supply: The Real Gap

Organ	Estimated Annual Need	Actual Transplants (2023)	Coverage (%)
Kidney	175,000–200,000	13,426	~7.7%
Liver	50,000	4,491	~9%
Heart	50,000	221	~0.4%
Lung	50,000	197	~0.4%

Sources: NAMS Task Force (2024), NOTTO Annual Report 2023-24^[1] ^[6].

Key Insight: In no solid organ category does India meet even 10% of national demand, resulting in the world’s largest waitlists and the annual loss of thousands of lives due to non-availability of organs.

3. Waiting Lists and Mortality Due to Organ Shortage

- **Current Estimates:**
 - Kidney: ~1.75 lakh active patients on dialysis/awaiting transplant^[6]
 - Liver: ~30,000–50,000 require transplants each year^[6]
 - Heart & Lung: Each about 40,000–50,000 patients/year in dire need^[6]
- **Annual Deaths:** More than **5 lakh (500,000)** Indians are estimated to die every year for want of an organ, particularly kidneys and livers^[4] ^[6].
- **Waiting List Data:** India has an **estimated 500,000 people** on various organ waiting lists, but this number is likely an undercount due to poor centralization outside leading urban centers^[6] ^[1].

4. Gender & Socio-economic Disparities

- *Women* make up the majority of living organ donors (~63% in 2023) but receive far less as recipients (less than a third), reflecting deep social inequalities^[4] ^[3].
- *Access:* Urban, wealthy, and educated populations are over-represented both as recipients and among those with access to timely diagnosis and referral.

5. System Challenges

- **Donation Rate:** Remains below 1 per million population, compared to 35–50 in Spain and advanced countries^[4] ^[2].
- **Awareness:** Myths, religious misconceptions, and lack of trust in public health institutions restrict deceased organ donations, especially outside southern and western India^[4] ^[3].
- **Infrastructure:** Only about a dozen states have fully functioning SOTTOs (State Organ and Tissue Transplant Organizations), precluding broad-based access^[3].
- **Coordination:** Fragmented waitlists and data silos across public and private sector hospitals result in inefficient matching and wastage of organs.

- **Financial Barriers:** >85% of transplants are funded out-of-pocket, and aftercare/immunosuppressants are rarely covered by health insurance^[4].

6. Policy Developments (2022–2024)

- **Removal of state domicile restrictions** for recipient registration—now any Indian may register for deceased donor organs in any part of the country, fostering equity^[2].
- Creation of an **Aadhaar-linked National E-pledge registry** for organ donors^[1].
- Implementation of express **“Green Corridors”** to improve organ transportation logistics.
- Campaigns such as **Angdaan Jan Jagrukta Abhiyan** to increase awareness^[5] ^[1].

7. The Motivation: Why an Organ Transplantation Management System?

a) Life-and-Death Urgency

More than **500,000 Indians**—roughly 1,370 people per day—die annually waiting for an organ they never receive. Less than 10% receive the life-saving transplants they require, with the gap greatest for heart and lung^[4] ^[6].

b) Escalating Demand, But Slow Progress

Even as transplants have more than tripled in a decade, **over 92% of organ need still goes unmet**. For every 20–25 patients in need, only one receives a transplant^[6].

c) Systemic Inefficiency

A single deceased donor can save or transform up to eight lives, yet institutional and logistical barriers prevent optimal donation and transplantation. Incomplete or delayed data, manual processes, and coordination lapses result in avoidable waste^[3] ^[1].

d) Social Justice

Gender and regional disparities—more women donate, but far fewer receive; southern and western states account for a lopsided share of all transplants. A digital management system could flag and help address such inequities^[3].

e) Impact: What Could a National System Achieve?

A robust, real-time OTMS—integrating waitlists, donor registries, logistics, and outcome tracking—could double the number of deceased donations within 2–3 years. Each additional 1,000 deceased donors could provide ~2,500 more organs annually, translating directly into a 15–20% reduction in preventable deaths per year.

8. Conclusion

India stands at a crossroads. Our progress in organ transplant technology, living-donor programs, and limited state-led initiatives has been significant, but the vast majority of those in need still die for lack of an organ. The implementation of a national, transparent, real-time organ transplantation management system is not merely a technical upgrade—it is an ethical imperative to save lives, reduce inequity, and bring India closer to global standards of organ donation and transplant care.

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