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Consent Without Capacity: Structural Hurdles in India's Organ Donation Ecosystem

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Abstract

India's organ transplant shortfall is often attributed to a lack of public willingness; yet the constraints lie within the system itself. To begin with, conflicting definitions of 'death' across legislations create uncertainty for certifying brainstem death. The pathways that could widen the donor pool—donation after circulatory death and expanded-criteria donors—remain unused due to the absence of national clinical guidance. Reporting to the national registry is incomplete, especially for tissue transplants, weakening planning and transparency. This report examines these structural hurdles and argues for unified legal definitions, a single and fully digital certification system, and time-bound national standards. It calls for increased capacity through hub-and-spoke retrieval networks, notified institutions of excellence, and a systematic programme to build a trained workforce, supported by reliable reporting and audits.

Attribution: Pulkit Athavle and K. S. Uplabdh Gopal, "Consent Without Capacity: Structural Hurdles in India's Organ Donation Ecosystem," *ORF Special Report No. 296*, Observer Research Foundation, January 2026.

Introduction

India's organ donation debate is typically framed as a question of public reluctance, but the evidence indicates otherwise. In practice, the constraint is less the absence of potential donors than the system's low conversion rate: many medically eligible deaths do not translate into timely certification, retrieval, and allocation. The pathway from potential donor to transplant is constrained by the system itself: definitions of 'death' are not fully aligned across the relevant laws, leaving clinicians uncertain when certifying brainstem death, thereby slowing consent and retrieval. Guidance on donation after circulatory death and expanded donor criteria is thin, so clinically viable organs go unused. Reporting remains uneven, especially for tissues, weakening planning, allocation, and public accountability. These weaknesses also create space for coercion in living donation and for transplant tourism that undermines equity.

The experience of other countries underlines the centrality of system design. Ireland, for example, in June 2025 moved to a soft opt-out model with a national register and continued family consultation. Early public reaction was intense, with many recording objections in the first days, and local experts argued that legislation alone would not raise donation rates without Intensive Care Unit (ICU) capacity, trained coordinators, and systematic audits of potential donors.[1] The lesson is straightforward: sentiment helps, but outcomes follow institutions. Countries that perform well tend to pair clear law with reliable data, hospital readiness, and enforceable standards. This report takes that systems view for India. It maps where the current framework proves inadequate and sets out a practical route to ethical scale.

Cultural Beliefs and Social Frictions

Institutional and legal barriers are central to debates around organ donation in India, but the social atmosphere in which families make end-of-life decisions also shapes outcomes. Consent for donation is rarely an individual act; it is closely linked to collective beliefs about the body, death, and morality. Myths around bodily disfigurement, concerns about ritual propriety, and mixed religious messaging continue to influence public behaviour, even when laws and infrastructure permit donation. Understanding these cultural and faith-based dynamics is therefore critical, not as the sole explanation for India's low donation numbers, but as one layer of resistance that interacts with systemic weaknesses and can either reinforce or undermine reform.

Resistance to Donation: Social, Cultural, and Religious Challenges

Organ and tissue donation in India is shaped by social, cultural, and religious determinants of public opinion and behaviour. Despite widespread awareness of the life-saving benefit of organ donation, deeply rooted assumptions remain barriers to its adoption. A common social phobia is fear of disfigurement after organ removal, which deters many from agreeing to donation.[2] The phobia is strongly associated with body-integrity-oriented cultures and those that regard the human body as sacred, especially in death rituals and funerals. A survey in Puducherry illustrates the gap: while 88 percent of respondents were aware of organ donation, only two-thirds agreed to donate, most frequently citing family pressure, fear of harm, and body-integrity taboos.[3]

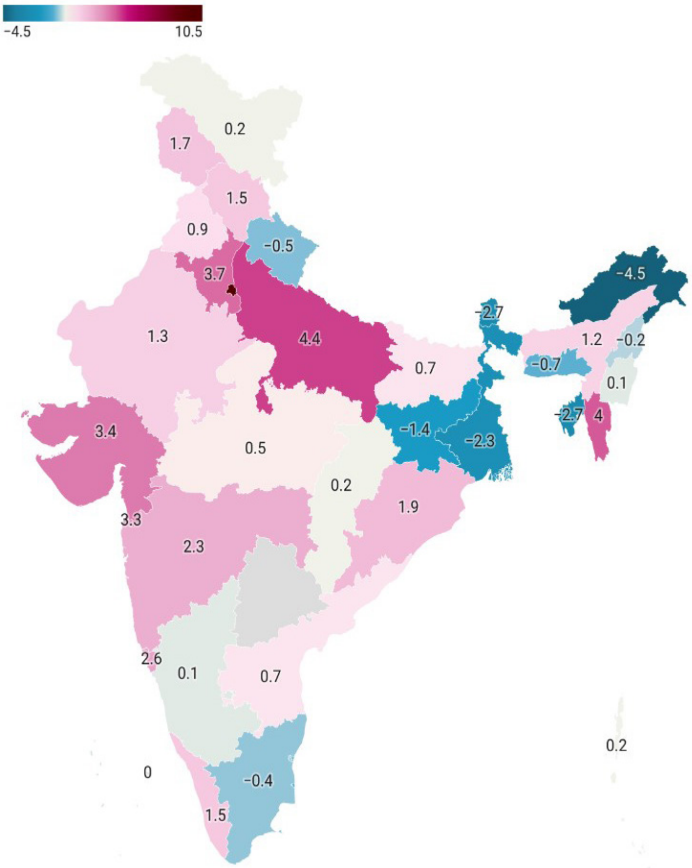
Studies in Chennai and Chandigarh similarly show that religious beliefs about death and the afterlife create scepticism and reluctance, even among otherwise sympathetic potential donors.[4] Family is a determining factor in such choices, especially in collectivistic societies like India, where organ donation is viewed as a family and not an individual choice.

Religious faith, though often seen as a deterrent, has a more complex reality. Most of India's major religions—Hinduism, Christianity, Sikhism, Buddhism, and Jainism—are broadly supportive of organ donation.[5,6,7,8] Hindu philosophical traditions emphasise '*Daan*' (voluntary giving), and mythological accounts such as *Kannappa*'s offering of an eye to *Lord Shiva* are frequently invoked to promote donation.[9,10] Christian and Sikh scriptures likewise endorse donation as acts of mercy and service. Jainism and Buddhism also frame donation as consistent with alleviating suffering and demonstrating philanthropy.

Some areas of hesitation persist within segments of the Muslim community, largely due to differing juristic interpretations of brainstem death and the preservation of bodily integrity. In the Shia tradition, for instance, Grand Ayatollah Ali al-Sistani does not sanction organ donation after death, while Grand Ayatollah Abu al-Qasim al-Khoei permits the donation of all organs provided the body remains recognisable.[11] Living donation of major organs (e.g., kidneys, liver) is also more often considered permissible by Sunni scholars than by Shia ones.[12] It should be noted that both Shia jurisprudence and Sunni jurisprudence in India predominantly sanction organ donation, though local religious authorities may differ in their opinions. Jehovah's Witnesses, although a small minority in India, approach organ donation on an individual basis because their disapproval of blood transfusions can complicate transplant surgeries.[13]

Gender and regional differences in willingness to donate also contribute, as seen in driver's licence data. Female licence holders are more willing to donate their organs/tissues in general, barring some pockets in East and North-East India (Figure 1).

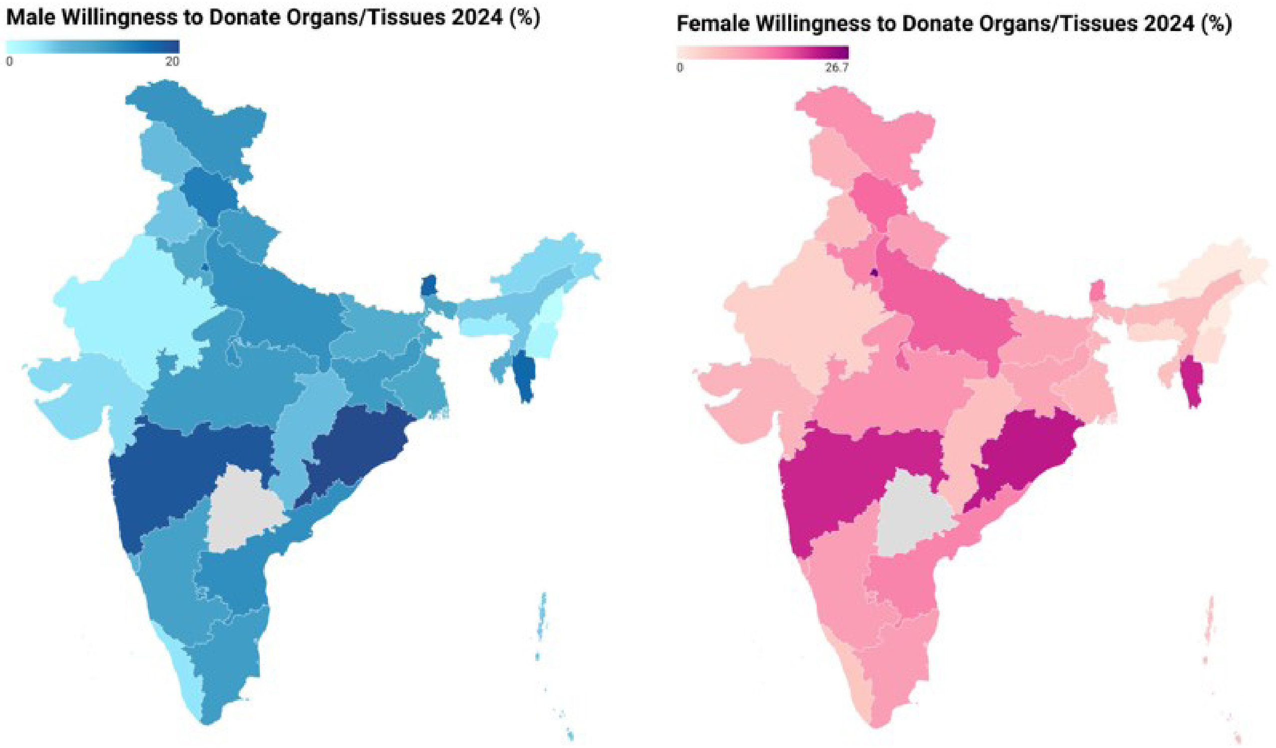
Figure 1: Excess Female Willingness to Donate Organs/ Tissues, 2024 (%)



Source: Authors' own, Data–NOTTO Annual Report 2024-25,[14] *Software–Datawrapper*

This should spur further research into why Indian males remain more resistant to the concept of organ donation. Regionally, states and territories such as Maharashtra, Odisha, Delhi, and Mizoram show higher willingness to donate across genders, while greater hesitancy persists in the northwest and northeast regions (Figure 2).

Figure 2: Male and Female Willingness to Donate Organs/ Tissues, by State



Source: Authors' own, Data–NOTTO Annual Report 2024-25,[15] *Software–Datawrapper*

Resistance to organ donation in India must be addressed with a holistic strategy that is both systematic and culturally sensitive. International models, especially the successful organ donation programme of Spain, can be insightful. Spain's presumed consent scheme, based on robust institutional support networks and wide popular trust, has recorded one of the world's highest donation rates.[16] While a wholesale transplant of this model to India could be culturally challenging, a soft opt-out strategy,[a] whereby consultation with the family is top priority, can be constructed, along with corresponding targeted awareness campaigns.

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[a] Opt-out systems presume consent for organ donation unless an individual has recorded a refusal, with variations in how family consent is incorporated.

Educational programmes must directly address common misconceptions, notably phobias surrounding body disfigurement and funeral practices. Social media and educational programmes can help demystify the donation process and highlight its life-saving role. It is also critical to involve religious and faith leaders. India's polio eradication campaign provides an example where faith leaders helped overcome vaccine hesitancy.[17] The same methodology can be implemented for organ donation, leveraging institutions that are well-respected such as temples, mosques, and churches, in order to increase awareness, specifically among rural and marginalised communities.

Less "controversial" types of donations, like amnion or skin donations, may be a good place to begin. India faces a high burden of burns, with more than seven million new cases annually, affecting women and children disproportionately.[18] A precedent for skin donation, where there are fewer religious and cultural concerns, can be used as a primer to build more acceptance for other tissue and organ donations.

Additionally, providing material rewards to cooperating families, e.g., free medical check-ups under Ayushman Bharat, can overcome opposition by families and build a strong incentive regime. Policies could draw upon successful elements of Spain's full-reimbursement model, focusing on rewarding donor families at the moment of donation.[19] Moreover, the National Organ and Tissue Transplant Organisation's (NOTTO) suggestion of offering "Near-Relatives" of deceased donors extra points in a future national allocation algorithm (should they need a transplant) could also be a powerful incentive.[20] However, safeguards are needed to prevent benefits being claimed by family members who did not consent to the donation; otherwise, those opposing donation could still substantially benefit from a relative's altruism. Thus, a verifiable online consent system should record consent from all near relatives (whether at the medical institution or elsewhere) and restrict benefits only to consenting "near relatives". Through proactively addressing these barriers, India can have an equitable, ethical, and more effective organ donation system that will save hundreds of lives in the long term.

A Death Undefined: Legal Ambiguities and Regulatory Gaps

India's organ donation ecosystem is not only affected by public perceptions; it is also limited by the legal and procedural frameworks meant to support it. At the core lies the definition and certification of death. The removal of organs depends on accurate and timely diagnosis of brainstem death and, lately, also circulatory death. However, India's laws have not adjusted to the medical facts. Differing legal definitions of death, gaps in certification procedures, and the lack of detailed national instructions on donations after circulatory death or on using expanded-criteria donors create hesitation among the staff and inhibit the conversion of potential donors into actual donors.

The Brain-Death Dilemma

The first and longstanding challenge concerns the legal and procedural issues around Donation after Brain Stem Death (DBD), which comprises the overwhelming majority of deceased organ donations in India. While the Transplantation of Human Organs and Tissues Act of 1994 (THOTA) includes Brain Stem Death (BSD) in its definition of death ("in whom permanent disappearance of all evidence of life occurs, by reason of brainstem death or in a cardio-pulmonary sense, at any time after live birth has taken place"),[21] this is absent from the Registration of Births and Deaths Act of 1969 (RBDA) ("permanent disappearance of all evidence of life at any time after live-birth") and the Bharatiya Nyaya Sanhita of 2023 (BNS) ("death of a human being unless the contrary appears from the context").[22,23,24] Consequently, a BSD patient may be considered 'dead' only when THOTA applies, i.e., their organs/tissues are retrieved for the purpose of transplantation.[25] If not, they may not be legally dead, such as if the family opposes organ retrieval.[26]

This has led to fears amongst doctors of legal consequences or police investigations upon certification of BSD for organ/tissue retrieval.[27],[28] In Kerala, for example, although the state government has issued a wide-ranging order that reinterprets death under the RBDA to include BSD, [29] doctors in the state still report conflicts with police officials.[30]

Second, certifying BSD for organ/tissue retrieval has certain procedural shortcomings that need urgent resolution. For instance, while Form 10 of the THOTA Rules provides a standardised document for recording BSD, including the tests to be conducted, it does not account for special cases where the patient is a child or the suggested tests cannot be conducted.[31,32]

Third, even for potential donors who qualify for BSD certification, procedural delays can make organ retrieval impractical. For instance, certification is of limited use when an autopsy is needed, as the 24–48-hour delay limits what organs or tissues can be retrieved. Similarly, during fatal accidents, medico-legal investigations in many states lie under the police station with jurisdiction over the accident site. [33] This can cause long delays in rural areas where the accident site and the nearest capable hospital are far apart, hindering timely organ retrieval. [34]

Finally, the lack of specialists trained in certifying BSD, proper storage of records and associated litigation pose additional challenges that may discourage even those who are familiar with the process.[35,36]

Clarifying and Protecting Brain-Death Certification

The legal validity of BSD certification remains a stumbling block for certification and concomitant organ or tissue donation activity. Whether the concerns are real or perceived, a definitive resolution would only help. Through legislative changes to the definition of death in the THOTA, RBDA, or BNS, or through a clarificatory Central Government Order or a Supreme Court ruling, doctors certifying BSD must be insulated from unnecessary legal and police investigations. This should be proactively communicated to police authorities and courts across India.

Second, collaboration with police authorities is crucial to encourage BSD certification and organ retrieval. The Ministry of Health and Family Welfare (MoHFW) and National, Regional and State Organ and Tissue Transplant Organisations (NOTTO/ROTTOs/SOTTOs)[b] should also work with police stations (and higher police authorities) that have jurisdiction over Non-Transplant Organ Retrieval Centres (NTORCs)[c] and transplant centres, to provide appropriate training and sensitisation about BSD and the legal basis for this. SOTTOs should also work with State Governments to implement Tamil Nadu's policy of allowing the hospital's local police station to initiate medico-legal investigations in fatal accidents, instead of waiting for the police station with jurisdiction over the accident site, which can reduce long delays in rural areas.[37] Learning from Tamil Nadu, MoHFW should also make relevant legal changes and work with other states to allow for organ retrieval and autopsies to occur simultaneously.[38]

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[b] NOTTO is the apex body for organ and tissue transplants in India. It coordinates with subordinate bodies at the Regional (ROTTO) and State (SOTTO) levels.

[c] NTORCs are medical institutions that have the capacity and approval to *retrieve* organs/tissues from donors but cannot carry out transplant surgeries.

Third, death certification procedures should be streamlined and digitalised urgently. All deaths in a medical institution, whether cardio-circulatory or brainstem, should be recorded online via a single form (with varied sections/options based on what the physician selects) and Aadhaar-linked sign-offs from relevant clinical staff for accountability. This should be mandatorily reported to SOTTOs and NOTTO so that local transplant coordinators can assess the deceased for organ donation potential. This will also improve the quality of India's births and deaths data. Moreover, clinical committees should be set up by NOTTO to list appropriate alternatives for the current tests – and specialised tests for children. These committees should aim to provide many accepted medical alternatives and finalise changes for implementation within six months.

To ensure standards are met, digital certifications should be scrutinised by online systems capable of detecting abnormal patterns and fake data. Moreover, a dedicated group of clinicians at the Central level should assess suspect certifications and a statistically significant sample of non-suspect certifications in a 'blinded' fashion for quality control and fraud/malpractice detection.

Finally, BSD certification should become a core part of the medical and nursing syllabus at all stages (in an appropriately graded fashion), assessed in institutional and national exams such as NEET-UG/-PG/-SS[d] and the INI-CET/-SS.[e] Testing should be more rigorous for those specialising in ICU care or relevant specialities such as nephrology or hepato-biliary medicine. This will facilitate organ and tissue donation in NTORCs, as doctors must understand both the medical facts and the broader medico-legal and regulatory context in which they operate. It should also be provided as a special certification conducted at select reputed medical institutes for existing professionals to upskill.

Underused Donors: Cardiac Death and Beyond

In Spain, 45 percent of transplantation activity comes from donations after circulatory/cardiac death (DCD).[f,39] In India, despite there being no legal bar, DCD activity largely remains in single digits annually, with only a few institutes such as the Post-Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, and the Institute of Kidney Diseases and Research Centre, Ahmedabad, conducting these.[40] Complicating

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[d] The National Eligibility and Entrance Tests (NEET) are a series of pan-India medical entrance examinations. The NEET-Undergraduate (NEET-UG) is the sole entrance examination for studying Medicine at Indian universities. For postgraduate medical specialisation training, the NEET-Postgraduate (NEET-PG) followed by the NEET-Superspeciality (NEET-SS) are available for admission into institutions other than those covered by the INI-CET or INI-SS.

[e] The Institute of National Importance (INI) examinations govern admissions to postgraduate medical specialty training programmes at designated leading institutions. The INI-Combined Entrance Test (INI-CET) governs admissions to postgraduate training (equivalent to Junior Residency) at these institutions; the INI-Superspeciality (INI-SS) is for admissions to higher postgraduate training (equivalent to Senior Residency programmes).

[f] There are 2 broad categories of organ donation after death: Donation after Cardiac/Circulatory Death (DCD) and Donation after Brain Stem Death (DBD). The Maastricht classification recognises 5 types of DCD. Types I, II, IV and V are classified as Uncontrolled DCD while Type III is considered Controlled DCD.
Type I: Patient is dead on arrival at hospital.
Type II: Cardiac death with unsuccessful resuscitation.
Type IV: Cardiac death that occurs during or just after BSD certification, but before organ retrieval procedures were initiated.
Type V: Cardiac death in a hospital patient.
Type III: Cardiac death after withdrawal of life-sustaining care (often anticipated) without patient being classified as BSD e.g. for hospice or palliative care patients.

matters, many public releases and annual reports by MoHFW,[41] NOTTO,[42] and state health authorities[43] misleadingly imply that organs cannot be donated upon cardiac death and/or that only tissues can be donated. This confuses clinicians and is exacerbated by the complete absence of formal clinical guidelines for DCDs in India.

The situation is similar for Expanded Donor Criteria (ECD)[g] donors, which form a key part of organ donation policies in Spain and the United States (US), comprising 21-23 percent of the deceased donor pool in the US.[44] In India, the publicly available Standard Operating Procedures (SOPs) produced by NOTTO only document ECD criteria for the Kidneys.[45] The lack of clear guidance on using other ECD organs is significantly limiting the organ pool, since these comprise 51 percent of livers and 24 percent of lung transplants in Spain.[46] It is also likely that most medical institutions in India, including the INIs, lack the equipment and trained specialists to enable donations from DCD and ECD donors.

Unlocking New Donor Pathways Through Clear Guidelines

For both DCD and ECD, sufficient high-quality research[47] and overseas guidelines exist to enable India to develop appropriate national guidelines within a 12-month period. A high-level committee constituted by NOTTO should review this evidence and produce clinical guidelines and SOPs for each of the five Maastricht DCD categories (or a modified version suited to the Indian context) for the kidneys, liver, heart and lungs.[48] This should proceed irrespective of current transplant capacity, as the aim is to remove regulatory bottlenecks to spur implementation. Similarly, ECD guidelines and SOPs can be finalised within a year by technical committees and should cover all organs, with special effort to formulate guidelines for those over 80 or with abnormal biomarkers or findings, including non-standard-risk donors (such as those with HCV infection).

It is well acknowledged that ECD organs (or even DCD organs in certain cases) have poorer graft survival than those from other donors. To deal with this, appropriate organ-prioritisation policies must be developed. For example, the old-for-old policy implemented in Spain and the Eurotransplant programme,[h] provides older kidneys to older recipients to minimise the medical and ethical consequences from their shorter survival.[49] Similar strategies can be formalised in India by allocating ECD and non-standard risk organs to higher-risk patients, such as those with a history of non-compliance or lifestyle choices that will lead to poor graft survival.

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[g] The Expanded Criteria were created to increase organ availability for transplant. These donors are those who may be outside traditional age criteria, have a history of chronic disease(s) or comorbidities or have other biochemical test abnormalities that would have normally exclude them from donating their organs. The criteria generally differ from organ to organ. The allocation of such organs mostly follows a 'like-to-like' system, e.g., organs from a donor above age 60 will be preferably given to a recipient above age 60.

[h] The Eurotransplant programme covers eight Northern and Central European nations: Austria, Belgium, Croatia, Germany, Hungary, Luxembourg, the Netherlands, and Slovenia. There is close coordination and data sharing between these countries to enable the best allocation of organs and greater efficiency.

Constrained Capacity: The Infrastructure and Human Resource Gap

Even the most carefully designed legal framework and data systems cannot compensate for a health system lacking the physical and human resources needed to support donation and transplantation. India's transplant infrastructure remains heavily urban, dominated by the private sector and unevenly distributed, leaving large parts of the country without retrieval or transplant capability. Serious gaps persist in intensive care units, surgical equipment, machine perfusion technology, quality control systems, and trained personnel. Such insufficiencies not only inhibit organ transplant activity but also foster inequalities, as the possibility of receiving a life-saving transplant depends on location and financial status. The following paragraphs explore how human and physical capacity constraints can become structural barriers in the development of an efficient donation system.

Infrastructure Bottlenecks

Government data shows that in 2015, only 240 Transplant Centres were actually performing transplants, and only ~48 of these regularly conducted non-kidney transplants.[50] This was mirrored across other transplants, with "above 600" registered corneal transplant facilities meeting only 1/4th of national demand.[51] While this had improved by 2021 to 529 active Transplant Centres and NTORCs out of a total 690 registered,[52] this still points to a huge shortfall for a country with a population exceeding 1.4 billion, with uneven distributions between regions (Figure 3).[i]

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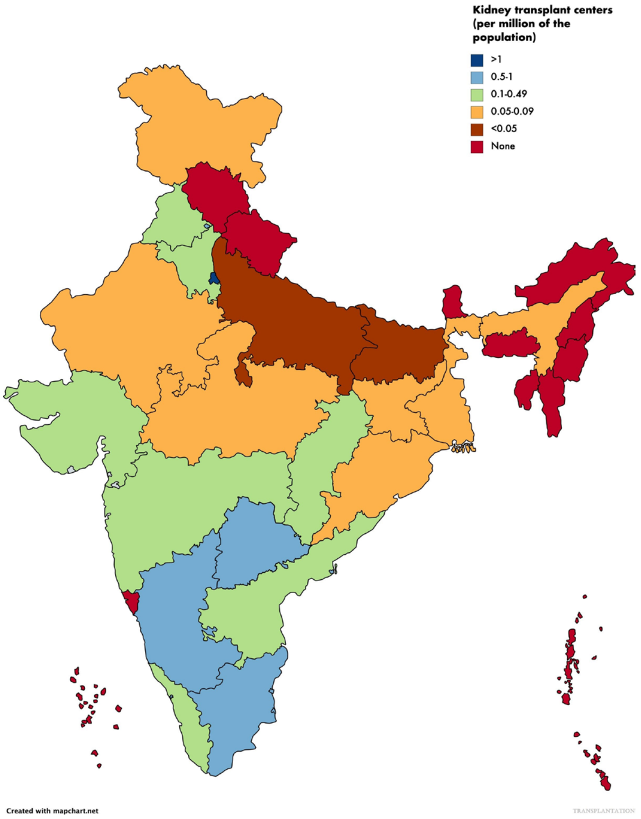
[i] The reasons for this have been discussed in ORFs previous special report on organ transplants. See: https://www.orfonline.org/research/inequities-data-deficiencies-and-capacity-constraints-the-challenges-to-organ-and-tissue-donation-in-india

Figure 3: Kidney Transplant Centres by State/UT (PMP)



Source: Divyaveer et al., 2021[53]

Note: PMP = Per million population. This is the most common unit of measurement in organ/tissue transplantation data.

This creates equity issues, with the National Academy of Medical Sciences (NAMS) Task Force reporting that "80 percent of kidney and liver transplants and 95 percent of heart, lung and pancreas transplant services are in private hospitals where the cost is prohibitive for the common man."[54] Besides the cost of the transplant, recipients are required to take expensive lifelong immunosuppressant drugs to prevent organ rejection. However, subsidies are limited, forcing many to become non-compliant and leading to poor transplant outcomes. These access barriers contribute to health inequality, as estimated transplant costs range between US$2,150-60,000—often well out of reach for the lower- and middle-income populations.[55]

Even at existing transplant facilities, there is a shortage of gold-standard facilities. Machine perfusion equipment—important for DCD and ECD transplants—is largely absent, even in prestigious institutions.[56] Similarly, advanced laboratory work such as donor-specific antibody screens, molecular/advanced diagnostics and advanced pathology workups are also limited to a handful of institutions.[57] This limits both organ/tissue transplantation and pre-/post-transplant care.

India's organ and tissue donation ecosystem is also inverted. Ideally, the ecosystem should operate on a hub-and-spoke model in which numerous NTORCs (spokes) retrieve organs and supply them to larger hospitals (hubs) that have the equipment, specialists and patient volume to perform transplants. However, India has only 140 registered NTORCs for 618 registered transplant facilities, sharply reducing the catchment area for potential donors.[58] There are varied reasons for this, including complex regulatory requirements, with the NTORC licence having a full 49 fields.[59] Moreover, the existence of principal-agent problems[j] is not conducive to the growth of organ/tissue transplants. For instance, private hospitals that receive deceased organs/tissues from public hospitals pay only a nominal fee, which does not incentivise the expensive process of deceased donor organ preservation by NTORCs nor the removal of market inefficiencies.[60]

Infrastructure shortages are compounded by funding issues. NOTTO documents reveal that only INR 1 lakh per annum is independently allocated for quality control.[61] The budgetary allocations for registration and inspections are combined with administrative expenses—including office equipment and court fees—totalling INR 6.3 lakh per annum,[62] which is likely insufficient. Additionally, while the government provides funds/subsidies for staff training and facility setup, there are shortfalls. For example, NOTTO provides INR 1 lakh to NTORCs/Transplant centres for each successful deceased donor to encourage cadaver preservation, but support is limited to only five cadavers per year and is offered only if at least one organ from the donor is successfully transplanted at a government hospital.[63,64] These restrictions do not incentivise rapid expansion of these activities.

Building a Functional Hub-and-Spoke Network

The government has undertaken good steps to adopt global best practices, including signing a memorandum of understanding (MoU) with the *Organización Nacional de Trasplantes* (ONT), which coordinates Spain's transplant system,[65,66] and providing financial assistance for establishing new organ retrieval and transplant centres. However, longstanding structural issues remain. Three broad areas of reform are needed to build capacity: creating the right financial incentives, institution building and strengthening quality control.

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[j] Principal-agent problems occur when one party (the principal) pays another party (the agent) to fulfil a need e.g., provide a service or otherwise act on their behalf. However, due to factors like information asymmetry and the compensation structure, the interests of the principal and the agent often become misaligned. Reducing the extent of misalignment is complex and requires careful analysis and appropriate compensation schemes.

Creating the Right Financial Incentives

First, principal-agent problems must be addressed. As in the US, private hospitals should pay public hospitals a standardised fixed fee when accessing their deceased organs/tissues which adequately covers the preservation costs incurred.[67] Although different parts of India will have different storage costs, accounting for this may unduly increase the regulatory burden. Similarly, while budgetary restrictions exist, cadaver-preservation subsidies should not be capped so low but linked to performance indicators (whether the organ/tissue is acceptable for transplant). However, the burden of additional subsidisation need not fall solely on the government. In return for removing the existing restriction that at least one organ must undergo transplantation at a government hospital, private hospitals could be asked to cover some or all of the subsidy when using organs/tissues retrieved from government hospitals. This would provide strong financial incentives for government hospitals (which face funding challenges) to increase organ retrieval activity, while allowing private hospitals to increase (profitable) transplant surgeries.

Second, access barriers such as the high cost of immunosuppressants and post-transplant medications impose costs on both the government and vulnerable patients. MoHFW must consider working with the successful and skilled domestic pharmaceutical industry to indigenise these crucial drugs, which could lower costs by magnitudes, as seen for CAR-T (Chimeric Antigen Receptor T-cell therapy) recently.[68] This could then be targeted for exports to developed markets, given their rising concern over medical costs. Joint (bulk) purchases, as for the National Cancer Grid, and dynamic stockpiling, as proposed by the author in a previous work, could help bring down costs further.[69,70]

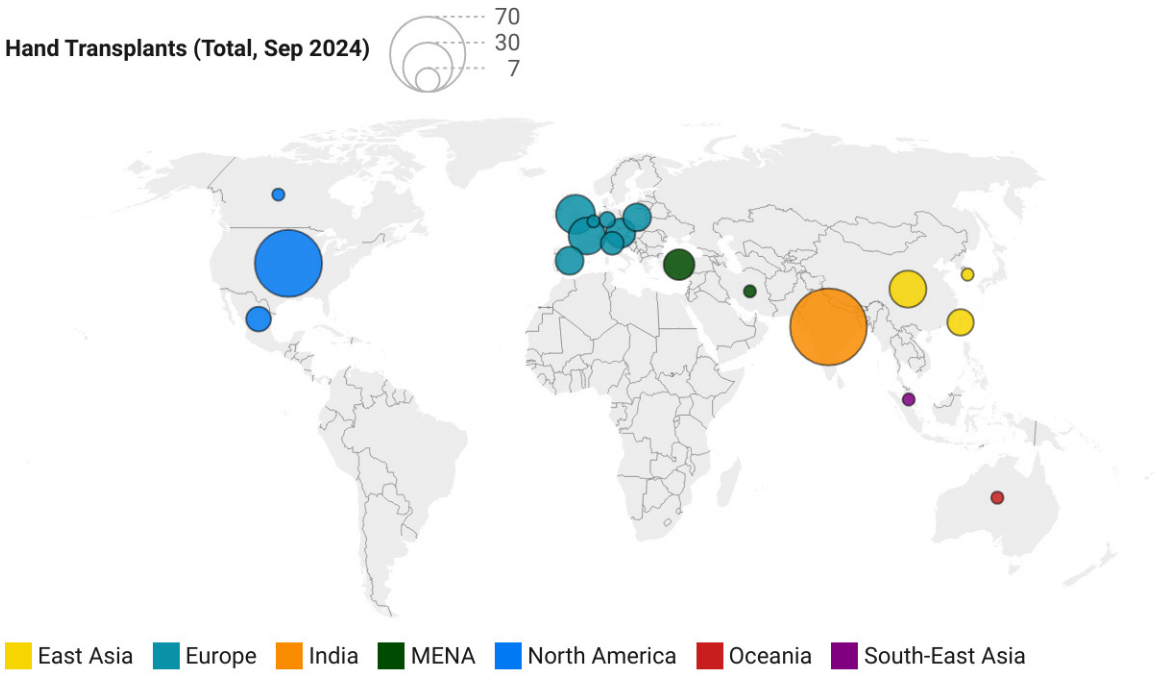
Institution Building

Institution building can be targeted at three levels: quaternary 'Institutions of Excellence' with trickle-down effects, expansion of biomaterial centres, and targeted cross-institution collaboration. First, sustained support should be offered to develop a few notified 'Institutions of Excellence (IOE)' for different organ and tissue transplants. These would act as quaternary healthcare centres, offering the critical mass required to introduce new technologies, refine techniques and disseminate research. They should be aligned to regional transplant needs, similar to how the Assam Cancer Grid has been set up to deal with higher rates of cancer in that region.[71]

For organs/tissues with greater transplant activity, such as the cornea, heart valves, kidney, and liver, there will be appropriately more notified IOEs across India, while for rarer transplants such as the pancreas or small bowel, this can be restricted to a few key institutes such as the All India Institute of Medical Sciences (AIIMS) New Delhi and PGIMER Chandigarh. IOEs should get extensive government assistance, financial and otherwise, to acquire new equipment (such as machine perfusion tools and gold-standard cryotherapy for tissues), build functional teams for complex transplants (DCD, ECD) and rarer transplants (pancreas, small bowel, hand, amnion, and pancreatic islets), and establish high-grade laboratory facilities. Funding can also be used to upgrade non-transplant areas of the hospital. MoHFW should not distinguish between public or private hospitals when selecting IOEs in the first phase, since the goal is to build physical hubs that can assist the entire ecosystem.

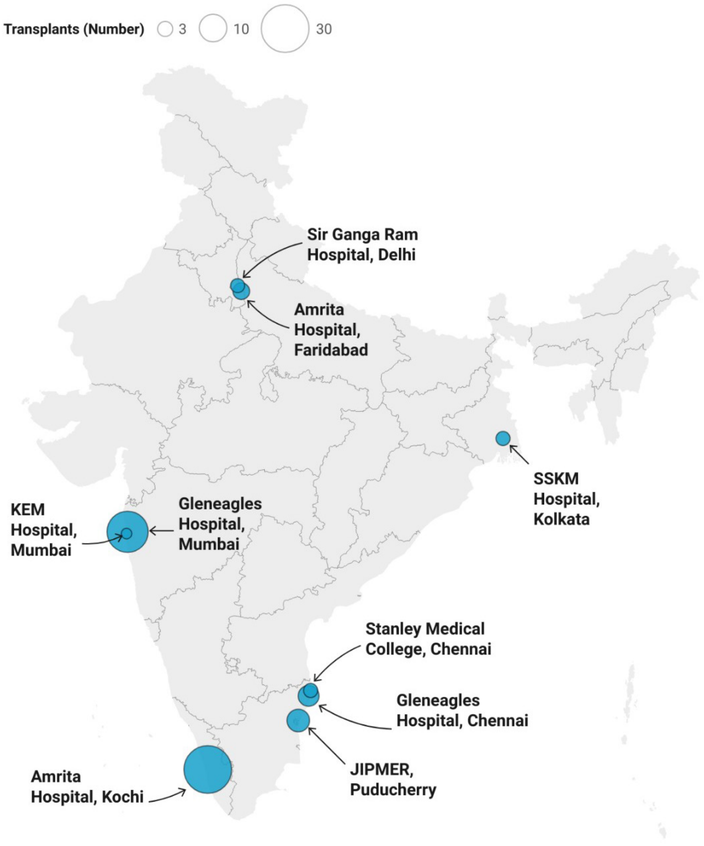
However, in return for this assistance, IOEs must commit to a rigorous charter requiring them to train the human capacity needed across India, as elaborated in a later section of this report. Trickle-down effects can be achieved even when Indian medical institutions are already operating at the cutting edge of transplantation—such as in hand transplants (Figures 4 and 5), by expanding activity and human capital to underserved areas.[72,73] As in Tamil Nadu, the government can nudge and facilitate tie-ups between IOEs and other institutions, particularly those in underserved areas.[74]

Figure 4: Hand Transplants (Global, up to September 2024)



Source: Authors' own; Data–Kadam, 2024; Software–Datawrapper

Figure 5: Hand Transplant Centres (India, up to September 2024)



Source: Authors' own; Data–Kadam, 2024; Software–Datawrapper

Second, the programme for establishing the National Biomaterial Centre at Safdarjung Hospital, along with Regional and State Biomaterial Centres in Tamil Nadu and Maharashtra, should be expanded.[75,76] So far, only bone products, skin grafts, heart valves, vessels and corneas are stored, but expansion to tendons, cartilage, muscle and amnion should be considered.[77] Moreover, while biomaterial centres aim to properly store retrieved tissues and distribute them for transplantation, many high-volume tissue procedures will require hospitals to maintain local storage. To ensure quality control, SOTTOs and ROTTOs can work with hospitals to release standard-format tenders inviting bidders that meet prescribed financial and experience norms to run hospital-based facilities across a state/region.

Third, complementary cross-institutional collaborations can be facilitated. The amnion, usually discarded with the placenta after delivery, has valuable wound-healing properties. Thus, NOTTO could facilitate tie-ups between Obstetrics and Gynaecology wards/institutions, Biomaterial Centres, and surgical practices (e.g., ophthalmological surgery, dermatological surgery, burns surgery) to obtain consent and retrieve amnions from new mothers for use in these surgeries. This can help normalise organ/tissue donation (and possibly opt-out donation) to the layperson more easily, as there would be no fear of physical desecration or monetary loss.

Finally, a time-bound committee of clinicians, bureaucrats and legal experts should simplify forms and regulations, similar to recent efforts in Income Tax reform.[78] This would reduce unnecessary administrative barriers including those hindering NTORC accreditation.

Quality Control Enhancements

Efforts to improve quality control must be strengthened and treated as a priority alongside expanding facilities, since negative publicity or fraud can damage organ donation efforts, as seen in Germany.[79,80] This can be done through international inspections and facility rankings, with Central government funding made conditional on healthcare reforms.

Similar to the MoU with the ONT, NOTTO should consider an MoU with the United Network for Organ Sharing (UNOS) in the US to gain additional perspective into developing a comprehensive transplant ecosystem in a large, federal and diverse country. These MoUs should include cooperation on regular quality-control checks and inspections. External experts from Spain, the US and other countries with high organ donation rates, along with top Indian doctors/medical experts, should physically assess all transplant facilities and NTORCs in a double-blind manner (with unblinding occurring as late as possible). These should ideally inspect facilities every year or two and produce public reports on the positive innovations and deficiencies observed. Appropriate multi-disciplinary norms should also be laid out that provide basic expectations of facilities based on equipment availability/functionality, hygiene, availability of trained personnel, and graft outcomes. Performance on these parameters should underpin publicly available facility rankings to avoid them aiming for minimum standards. The public nature of the reports and rankings should introduce healthy competition and spur improvements.

Additionally, MoHFW must use appropriate carrots-and-sticks to improve the state of healthcare facilities, including transplant facilities. The recent move to make National Health Mission funding conditional on public healthcare facilities meeting National Quality Assurance Standards certification requirements is a welcome move.[81] Similar to how the government allows states to access enhanced borrowings and special assistance loans conditional on various reforms, e.g., power sector reforms, it should implement the same model for a broad-based package of health reforms with increased funding, quality checks, hygiene, trained personnel and functional equipment at NTORCs and transplant facilities being a key part.[82] As part of this, the government should aim for “One District, One NTORC” to operationalise the hub-and-spoke model.

Staffing Challenges Across the System

Even with appropriate physical capacity, transplant accessibility is hindered by human-capacity constraints, with the NAMS Task Force Report noting that most stakeholders agree that there is a serious shortage of transplant staff at all levels (Table 1).[83] Currently, no formal assessment has been made regarding the extent to which personnel gaps exist in the transplant ecosystem nor the marginal impact of the current shortages. Human capacity shortages may be greater in rural areas and in public hospitals.

Table 1: Transplant Staff and Roles

Personnel Type	Role
Surgeons	• Transplantation of organs/tissues, especially for thoracic organs • Organ/Tissue retrieval at NTORCs • Machine perfusion
Physicians including ICU doctors and Intensivists	• Pre- and post-transplant care and management • Machine perfusion • BSD Assessment • Organ/Tissue Donation Assessment for Critically-Ill patients
Psychologists/Psychiatrists	• Assessment and evaluation of donors and recipients for fraud, coercion and informed consent
Specialist Nurses	• Management of critically-ill transplant candidates in the ICU • Machine perfusion and organ/tissue preservation • Pre- and post-transplant care & Perioperative nurses
Paramedics	• Paramedics trained in management of recorded deceased donors or critically-ill transplant candidates
Transplant Coordinators	• Management of the entire transplant process including donor-recipient interrogation, counselling, medical and legal work-up, administrative liaising
Tissue Bank and Laboratory Staff	• Appropriate management of organs/tissues, particularly tissue biobanks

Source: Authors' own.

Moreover, there are few dedicated certification pathways for transplantation. The NEET-SS offers only "Organ Transplant Anaesthesia & Critical Care", with other relevant skills subsumed into broader training programmes such as "Hand Surgery" and "Cardiovascular & Thoracic Surgery".[84] The INI-SS offers a few more options, including the Master of Chirurgiae (MCh)[k] in Renal Transplant at PGIMER, Chandigarh, and the Doctorate of Medicine (DM)[l] in Cardiac Surgical Intensive Care.[85] Similarly, for tissue transplants, there are no national certifications, although institutions such as the Aravind Eye Centre offer programmes like the "Fellowship in Cornea", which includes specialised transplant training.[86]

These issues are unlikely to be solved by increasing posts or medical seats or by reducing qualifying cut-offs, as similar measures have failed for other superspeciality courses and newer AIIMS institutions, which continue to face severe manpower shortages.[87] Reasons include low remuneration in medical and surgical training, lack of monetary incentive for more challenging training and employment in transplants (including for nurses and paramedics), work-life balance, and a preference for certain prestigious institutions such as AIIMS New Delhi.[88] Similarly, while the NAMS Task Force recommends that all medical colleges should be set up as NTORCs, this is unlikely to succeed due to the aforementioned manpower challenges.[89]

Investing in People to Power the Transplant System

First, NOTTO should work with interested organisations, private-sector researchers and international experts to quantify the degree of personnel gaps across India. The data should be granular to devise appropriate strategies at the national and state level, with district-level data being ideal, given the vast size of many Indian states and significant social, economic and demographic differences within them.

Second, there is a need to incentivise organ retrieval surgeons, physicians, and allied healthcare staff at NTORCs to undertake such activity in their institutions. Given existing concerns around remuneration, this could be incentivised by working with states to institute permanent salary increases for those who gain relevant certifications (e.g., BSD, organ retrieval surgery) and apply it regularly in their practice. This would encourage upskilling and increase interest in NTORC activity.

Third, as mentioned in the previous section, IOEs should set up dedicated superspeciality training programmes for different types of organ and tissue transplants, especially the common ones. For rarer transplants (e.g., small bowel transplants), these need not be standalone programmes but can be offered as focused training to ensure greater exposure. After gaining experience at IOEs, trainees can be channelled

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[k] The MCh. is an advanced super-speciality degree in surgery.

[l] The DM is an advanced super-speciality degree in medicine.

to regional AIIMS and leading state institutions where transplant caseloads may be lower, for permanent positions. These programmes should also train allied health staff, including in transplant-related work and death certification. Where private institutions receive government assistance for physical capacity, they should offer affordable, subsidised programmes for trainees from less well-off backgrounds.

India’s Transplant Ethics Dilemma

Beyond regulation, data, and capacity shortfalls, India’s transplant system is strained by serious ethical and equity challenges. Gendered and monetary coercion cannot always be identified by overworked and understaffed Transplant Coordinators. Moreover, the fragmentation and opacities in organ transplant systems also lead to inefficient allocations that harm patients. This lowers public trust, reducing compliance and the willingness to donate. The next section describes the issues of coercion in living donors and the need for a unified national registry.

Gender and Power in Living Donation

Gendered and monetary coercion remain serious challenges in India.[90] Psychological and/or psychiatric assessments are not being conducted frequently enough to assess whether donors are being coerced or whether both parties understand the process of organ transplantation and the subsequent impact on their lives. Under the law, qualified Transplant Coordinators (TCs) are supposed to manage grief counselling, consent garnering, fraud detection and psychological assessments for all donors and recipients.[91] However, they are often overwhelmed by the degree of work, and many medical institutions flout this requirement.[92] Counselling and evaluation are further hindered by shortages of trained personnel and the absence of private spaces for sensitive discussions.[93]

Safeguarding Consent Through Stronger Oversight

Transplant Programme Accreditation should mandate dedicated soundproof rooms available 24/7 for counselling and evaluations, graded by bed capacity and urbanisation. Mental health counselling for deceased donor families and psychological or psychiatric evaluations for living donors and recipients should also be made mandatory under law, as in Singapore.[94] To combat the shortage of personnel, especially in rural areas or where staff might face threats to safety for blocking coercive transplants, MoHFW should initiate a programme to train and hire counsellors, psychologists, and psychiatrists for organ transplant activity that can conduct tele-assessments and tele-counselling from larger urban centres and hospitals.

All NTORCs and transplant hospitals should be required to conduct counselling and evaluations for all donors and recipients. Institutions must either hire trained personnel or use the tele-assessment facility. Evaluations and counselling must include assessments of mental state and coercion, and assessors should be empowered to block a transplant when concerns arise. The clinical notes from these conversations should also be uploaded onto a single portal run by NOTTO to ensure that counselling/assessments are occurring and are sufficiently detailed. These records can then be analysed centrally, including via Artificial Intelligence tools, to identify fraud patterns.

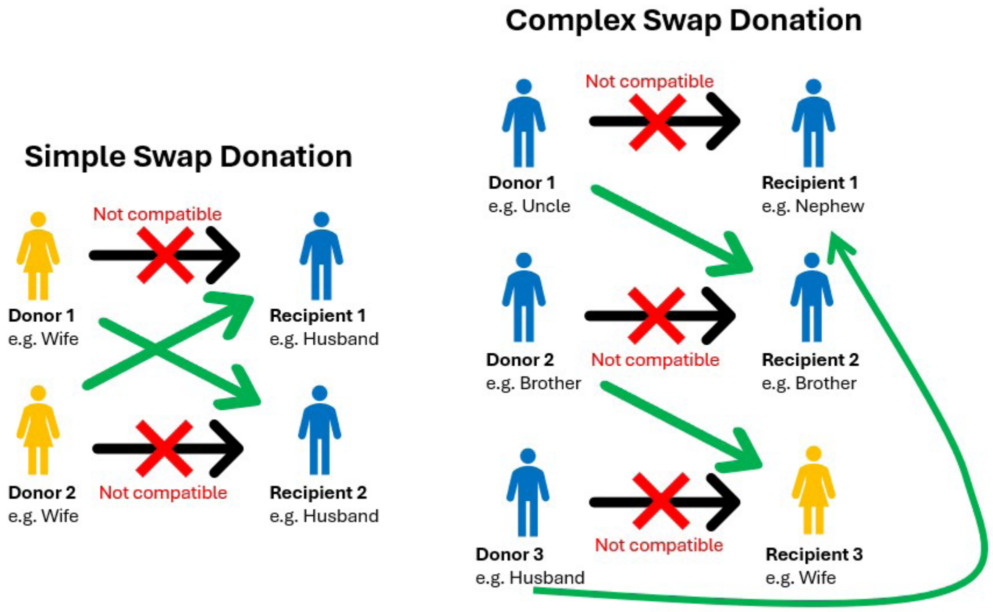
Matching and Allocation Opacities and Inefficiencies

India's organ and tissue transplant system is fragmented and inadequately digitised. The problems are manifold: registries are fragmented across states, allocation criteria for organ transplants vary between States and allocations are often manual,[95] and waiting lists are not clear for patients and practitioners.[96,97]

This has two effects. First, inefficiencies in matching and allocation have direct human costs: recipients can miss out on life-saving transplants due to inadequate information or poor matching within and between States and UTs. Second, ethical challenges arise because a patient's likelihood of receiving a transplant can depend on their State,[98] which could encourage arbitraging behaviour. More broadly, transparency is crucial for trust in the fairness and safety of transplants, and these opacities exacerbate long-standing mistrust in India's donation system,[99] discouraging potential donors.

The lack of a unified national system also impinges on swap donations,[100] which are a special type of organ matching where unrelated potential donor-recipient pairs can work out a mutually beneficial swap (Figure 6). Although swaps may seemingly rely on pure chance, a large digital registry of donor–recipient pairs increases the probability of successful matches. Estimates suggest that a national swap system could see a 35-percent increase in Living Donor Kidney Transplants, with global studies reporting 25-35 percent increases for this transplant.[101]

Figure 6: Swap Donation Examples



Source: Authors' own

One Nation, One System: Consensus-Building needed for a Real-time, Uniform and Efficient National Transplant System

NOTTO's 2025 Chintan Shivir Report reiterates key reforms, such as a national digital registry with donor/recipient waiting lists,[102] which has remained unrealised despite its inclusion in the National Guidelines of 2015 and 2021.[103,104] Some positive steps, including searchable information on transplant facilities and staff on the NOTTO website, have been implemented.[105] These are necessary steps—although greater speed of reform is needed. Further necessary improvements need consensus-building with all States/UTs given India's federal structure.

A new registry system must be comprehensive rather than piecemeal, serving as the single portal governing all transplant activities across India. Such a 'One Nation, One System' model would include:

- Storage and logging of consent from all relevant parties, including donors, recipients and family members. This should preferably be electronic, with relevant parties able to verifiably give and revoke consent through accessible options, such as Aadhaar-linked systems (e.g., Aadhaar fingerprinting, website-based consent). Consent options should be available in multiple languages to ensure informed decisions and provide a safeguard for doctors.

- A common national organ allocation algorithm developed through consultation with States and UTs, as no single allocation model is universally optimal.

- Standardised administrative documents for all stages of transplantation, including forms, licences, and transplant coordinator assessments.

Pathways to Reform

India can expand ethical and equitable donation only by aligning law, data, capacity and accountability. Legal harmonisation is the first step. Definitions of death should allow clinicians to certify brainstem death without fear of investigation. A single, digitised death-certification workflow for cardiac and brainstem deaths should feed automatically to SOTTO and NOTTO, use Aadhaar-linked sign-offs, and include paediatric and exceptional-case protocols. In parallel, national clinical guidance is needed to operationalise donation after circulatory death and the use of expanded criteria donors, ensuring potential donors translate into actual transplants.

Capacity must follow clarity. A functional hub-and-spoke network should be built around One District, One NTORC, with retrieval centres linked to regional transplant hubs with ICU capability, machine perfusion, laboratory diagnostics and trained teams. Government support should designate a small set of Institutions of Excellence to anchor complex and low-volume procedures, paired with time-bound quality upgrades and public rankings of centres. Principal–agent frictions can be reduced through cost-covering fees paid by private hospitals to public retrieval centres and by removing arbitrary caps on cadaver-preservation support, substituting performance-linked subsidies instead. Affordability requires a domestic strategy for immunosuppressants and key post-transplant medicines, complemented by pooled procurement.

A simple regulatory clean-up can cut gratuitous form fields and modernise licencing, while a national transplant audit system performs blinded reviews of a sample of certifications, allocation decisions and outcomes to identify error or fraud.

Ethics and consent need active safeguards. Mandatory psychological assessment of all living donors and routine grief counselling for families should be enforced, with secure, auditable notes uploaded to a national portal and capacity for tele-assessment from urban hubs. Minimum infrastructure standards for private counselling rooms should be built into accreditation. Data must become the backbone of governance. NOTTO should publish timely, anonymised, state-wise and centre-wise organ and tissue data, including waitlists, retrievals, allocations and outcomes.

Finally, collaboration should be systematic, not episodic. India can deepen technical partnerships with Spain's ONT and the United States' UNOS to co-develop DCD and ECD protocols, retrieval logistics, audit methods and public reporting templates, and to run joint quality inspections of Indian centres. Together, these moves create a coherent operating model: clear law, digitised BSD and DCD pathways, reliable NTORCs, skilled teams, transparent data and enforceable ethics.

Conclusion: Towards a System That Can Say Yes

India has the science, clinical talent and growing public sympathy for donation; what it lacks is a system that converts intent into action. Legal ambiguity over death, fragmented reporting and limited capacity at retrieval and transplant centres routinely stall the path from potential donor to actual transplant. Consent falters when clinicians fear investigation, when coordinators are overextended, and when families must decide in hospitals that cannot reliably certify brainstem death or retrieve and preserve organs in time. Until these structural obstacles are removed, incremental awareness drives will continue to yield incremental results.

A credible route to scale is now clear: harmonise the law on death and digitise certification; publish timely, centre-wise data and institute routine audits; build a genuine hub-and-spoke network anchored by NTORCs and a small group of institutions of excellence; invest in human capital, counselling spaces and tele-assessment; and anchor reforms in partnerships with high-performing international programmes. Once legal clarity, ethical safeguards and operational readiness match public willingness, India can move beyond aspirational goals to a transplant system that says yes more often, and does so fairly, safely, and at national scale.

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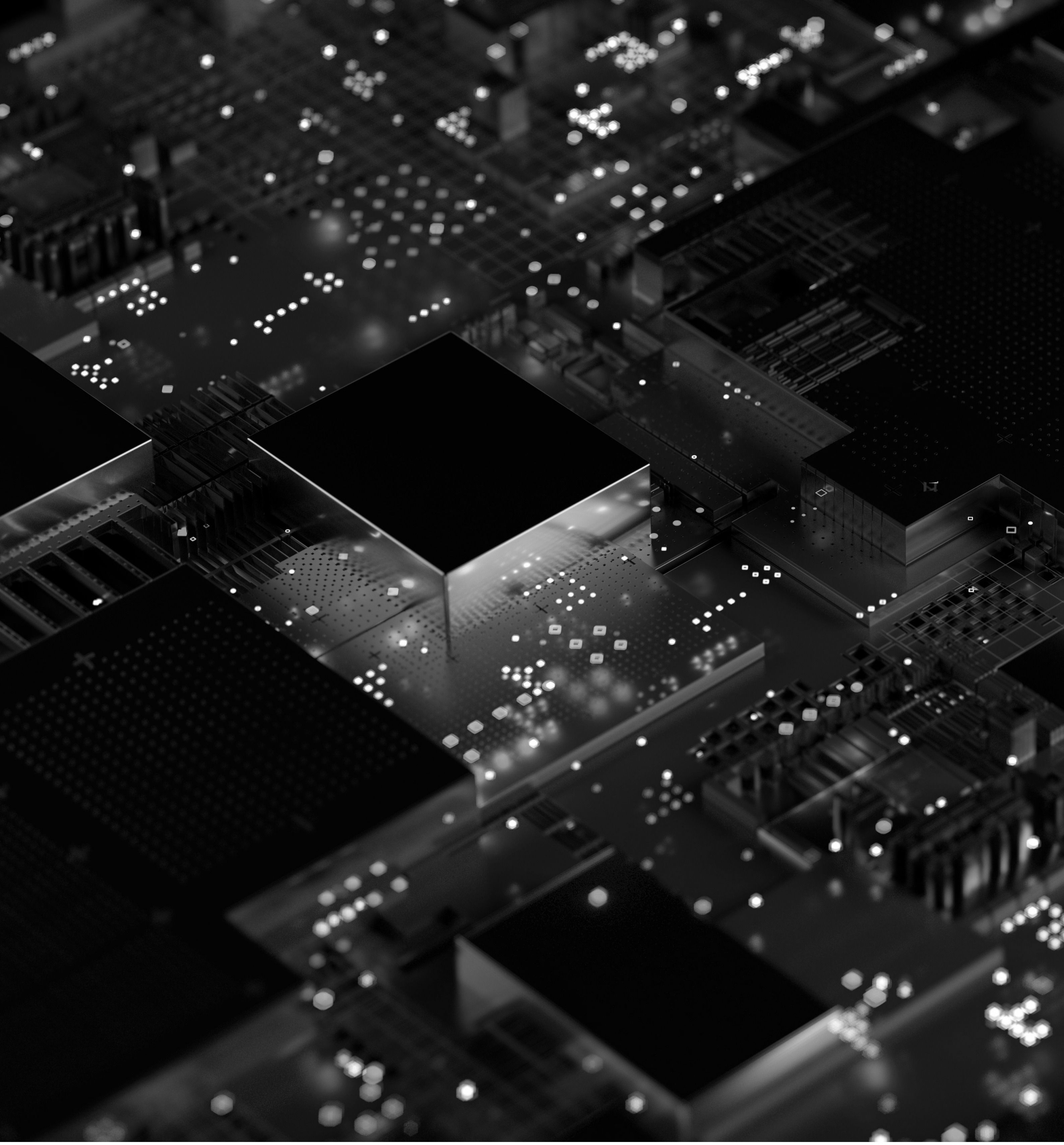

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