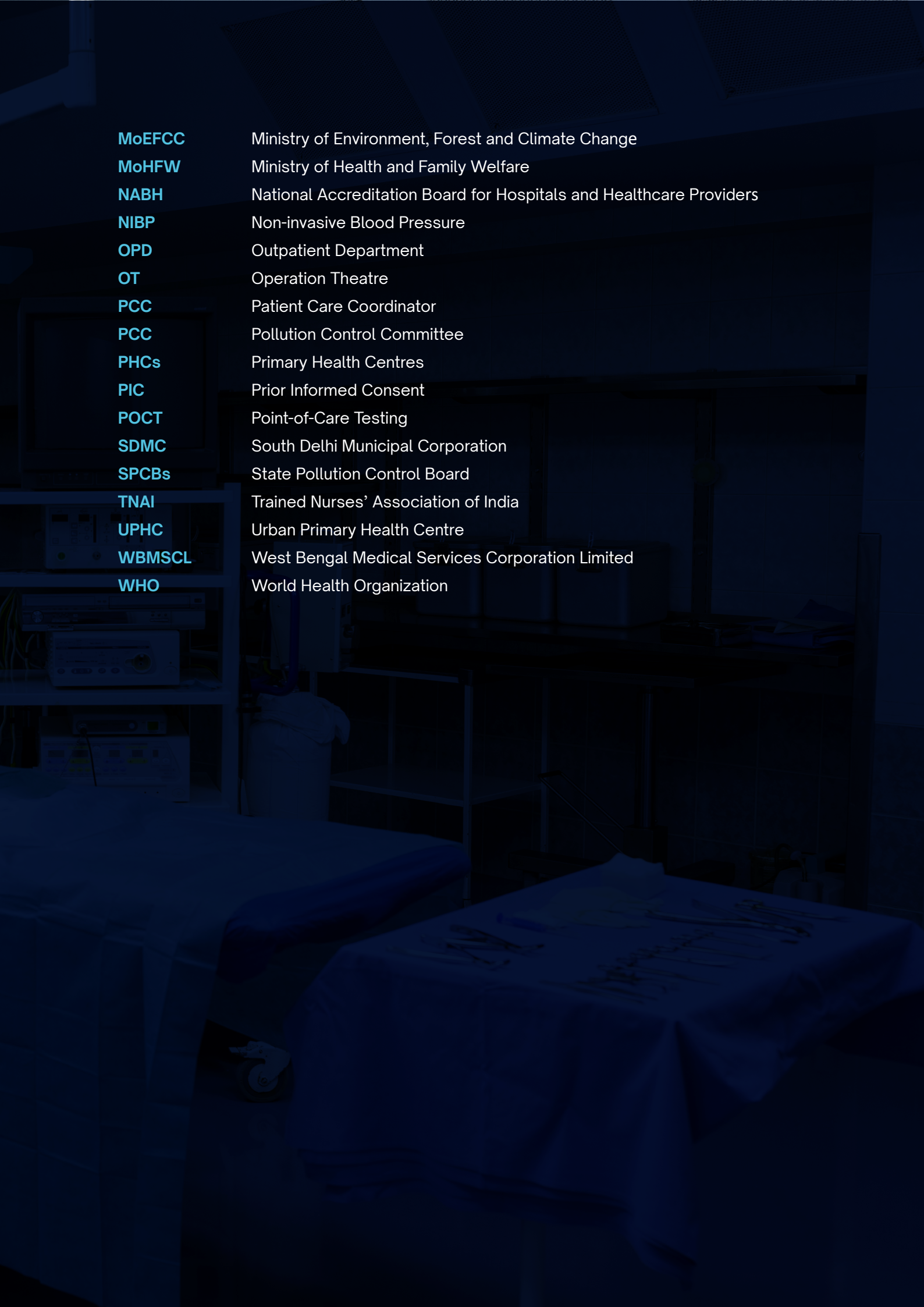
Toxics Link
for a toxics-free world

SUMMARY REPORT

DOCUMENTING MERCURY- FREE MODEL HEALTHCARE FACILITIES IN THE COUNTRY

Abbreviations

AAMI	Association for Advancement of Medical Instrumentation
AMC	Annual Maintenance Contract
BEMMP	Biomedical Equipment Management & Maintenance
BIS	Bureau of Indian Standards
BME	Bio-medical Engineering
BMSICL	Bihar Medical Services and Infrastructure Corporation Limited
BP	Blood Pressure
CDSCO	Central Drugs Standard Control Organisation
CHCs	Community Health Centers
CHWTSDF	Common Hazardous Waste Treatment, Storage, and Disposal Facility
CME	Continuous Medical Education
CMS	Centers for Medicare & Medicaid Services
CPA	Central Procurement Agency
CPCB	Central Pollution Control Board
DGHS	Directorate General of Health Services
DH	District Hospital
DHS	Directorate of Health Services
DoHFW	Department of Health and Family Welfare
DRS	District Reserve Store
ESH	European Society of Hypertension
GeM	Government e-Marketplace
GFR	General Financial Rules
GNCTD	Government of National Capital Territory of Delhi
GoB	Government of Bihar
GPCB	Goa Pollution Control Board
GWMC	Goa Waste Management Corporation
ISO	International Organization for Standardization
JCI	Joint Commission International Accreditation
LCD	Liquid Crystal Display
MCD	Municipal Corporation Delhi



MoEFCC	Ministry of Environment, Forest and Climate Change
MoHFW	Ministry of Health and Family Welfare
NABH	National Accreditation Board for Hospitals and Healthcare Providers
NIBP	Non-invasive Blood Pressure
OPD	Outpatient Department
OT	Operation Theatre
PCC	Patient Care Coordinator
PCC	Pollution Control Committee
PHCs	Primary Health Centres
PIC	Prior Informed Consent
POCT	Point-of-Care Testing
SDMC	South Delhi Municipal Corporation
SPCBs	State Pollution Control Board
TNAI	Trained Nurses' Association of India
UPHC	Urban Primary Health Centre
WBMSCL	West Bengal Medical Services Corporation Limited
WHO	World Health Organization

01 Introduction

1.1. Mercury and the Minamata Convention

Mercury, also known as quicksilver, is a naturally occurring substance recognised as a chemical of global concern following the Minamata disaster. This heavy, silvery-white metal remains liquid at room temperature and evaporates easily. Once released, mercury persists in the environment, travelling long distances and circulating through air, water, soil and living organisms. It concentrates as it moves up the food chain, reaching its highest levels in predator fish, which poses serious health risks when consumed by humans. Exposure also impacts ecosystems, including reproductive effects on birds and predatory mammals.

Recognising this threat, the world adopted the Minamata Convention on Mercury in 2013, a legally binding treaty designed to protect human health and the environment. The Convention entered into force on August 16, 2017[1]. Major highlights of the Convention include banning new mercury mines, phasing out existing mines, restricting mercury use in products and processes[2] controlling emissions, and regulating artisanal and small-scale gold mining.

1.2. Minamata Convention and India

India ratified the Minamata Convention, becoming a Party on September 16, 2018.[3] The Convention mandates the phase-out of mercury-added products listed in Annex A. India strengthened its trade regulation (export and import) under the Prior Informed Consent (PIC) procedure. Concerning Annex A products (thermometers and sphygmomanometers) and the manufacturing process for Acetaldehyde, India has registered exemptions, extending the phase-out date by five years until 2034 and 2023, respectively, from the initial 2020 and 2018 timelines[4].

1.3. Study Objectives and Rationale

The present study, conducted by Toxics Link on selection by the World Health Organization (WHO), documents the mercury phase-out process in Indian healthcare facilities. The focus is specifically on the status of usage and phase-out of mercury-added thermometers and sphygmomanometers. The goal is to understand the challenges faced, the strategies adopted, and finally to learn lessons which can facilitate a smoother transition in other healthcare facilities across the country. The document aims to provide clarity on the stepwise process of transition for the wider healthcare community.

1 https://minamataconvention.org/en/documents/minamata-convention-mercury-text-and-annexes
2 Annex A and B of the Minamata Convention
3 https://minamataconvention.org/sites/default/files/documents/national_report/Report_IND_2019.pdf
4 https://chemicals.gov.in/minamata-convention

1.4. Scope and Methodology

The study followed two types of approach- a thorough and detailed assessment of government and private healthcare facilities and clinics in Delhi and Goa, and the other, a rapid assessment of government and private healthcare facilities in the eastern states of Bihar and West Bengal.

Delhi, the capital city of India was selected because it was the first state in India to initiate the phase-out process as early as in 2007 with phase out order issued by the Delhi Pollution Control Committee (DPCC) after a meeting under the Health Secretary of Delhi. The office order in regard to that, from the Delhi Pollution Control Committee is referenced[5]. Goa was selected as a model state, initiating its transition much later (2018–2019) but demonstrating strong institutional commitment and governance. Both Delhi and Goa have achieved complete mercury phase-out in their public healthcare facilities.

A combination of primary and secondary research was followed. A representative sample of 15 healthcare facilities combined in Delhi and Goa, including both public and private entities, was surveyed using a comprehensive questionnaire and visits. For rapid assessments, the states of Bihar and West Bengal were selected based on Toxics Link's prior experience in those regions. The entire focus of the study was to understand the transition status and associated challenges.

The documentation analysed the transition process based on four key drivers identified as instrumental in the process –

- State/Institutional Policy
- Staff Training and Education
- Procurement
- Quality Control
- Calibration

5 https://toxicslink.org/wp-content/uploads/2022/08/Mercury-phase-out-order.pdf

02 Study Finding in Delhi

Delhi was the first city to initiate mercury phase-out from the healthcare sector, preceding India's ratification of the Minamata Convention.

2.1. Evolution of Mercury Phase-out in Delhi

The sustained efforts of Toxics Link through advocacy and research expedited the progress in mercury management in Delhi, starting in 2004 with a report documenting mercury releases from the healthcare sector. Five premier Delhi hospitals voluntarily moved away from mercury in 2005, and their success was documented. These documents were presented to the health secretary of Delhi, which led to the issuance of the first phase-out order. The formal phase-out began in 2007 when the DPCC, under the Government of National Capital Territory of Delhi (GNCTD), directed all hospitals in Delhi to phase-out mercury use by December 2007.[6] This phased shift started with replacing mercury Blood Pressure instruments and thermometers in the Outpatient Department (OPD) with non-mercury alternatives, like portable Non-invasive Blood Pressure (NIBP) monitors and digital thermometers. A Central Government directive followed in March 2010 from the Ministry of Health and Family Welfare (MoHFW), advising Central Government hospitals to develop a phase-out plan. The Central Pollution Control Board (CPCB) also issued guidelines in 2012 for the environmentally sound management of mercury waste generated from healthcare facilities.[7]

2.1.1. Internal Policy

As observed, Internal policies in surveyed hospitals acted as the necessary backbone for structural change, ensuring a uniform and enforceable directive for all stakeholders (doctors, nurses, procurement teams, etc.). During the documentation process, the policy facilitated systematic planning, like setting up of timelines, staff training, calibration procedures, and safe disposal mechanisms for mercury waste.

All surveyed government facilities had initially drafted and circulated written policies during the transition period, incorporating mercury-free alternative in their in-house policies. However, these documents are no longer maintained actively by the healthcare facilities, as they have already achieved a mercury-free status. **A systematic inclusion of mercury-free alternative instruments in their procurement policy is they key driver for change.**

> **"The posture of patients plays a crucial role while taking BP readings. Thermometers are handed over to patients only after providing them with a proper demonstration of their use."**
>
> - Head Infection control, Sir Ganga Ram Hospital

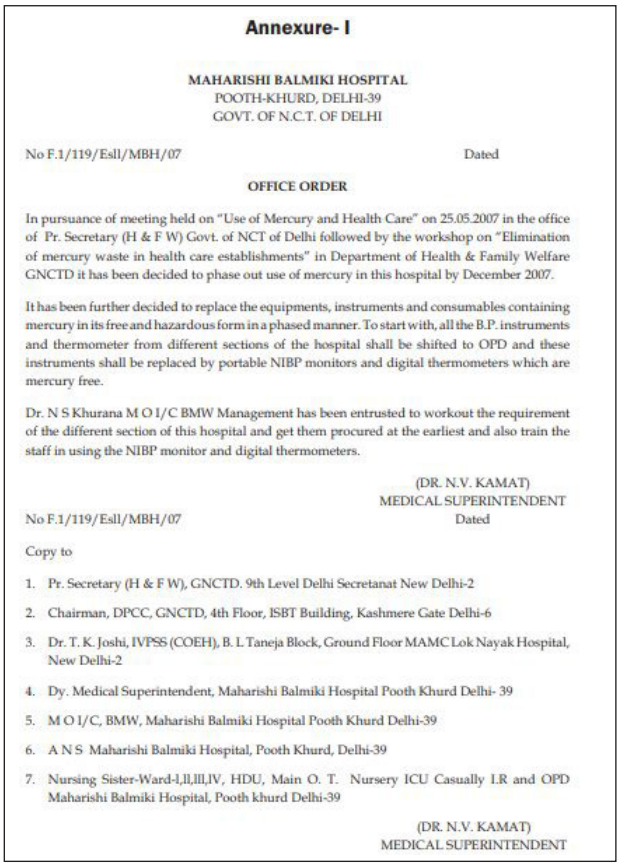
6 https://toxicslink.org/wp-content/uploads/2022/08/Mercury-phase-out-order.pdf
7 https://cpcb.nic.in/uploads/Projects/Bio-Medical-Waste/Guidelines_for_ESM_MercuryW_fromHCFs.pdf

In government facilities, the Infection Control Committee or Senior Medical Administration officers monitored the overall phase-out. Private hospitals accredited by National Accreditation Board for Hospitals (NABH), such as Max Healthcare and Sir Ganga Ram Hospital, proactively adopted mercury-free instruments and chief medical officer (CMO) and medical suprintendent monitored phase-out policy.

2.2.2. Staff Training and Education

Effective training and educational programs are essential to ensure staff proficiency with mercury-free devices, especially given the historical perception of mercury as the "gold standard." Training promotes behavioural change and ensures a smooth, sustainable transition without compromising patient care.

- **Government Hospitals:** In 2010, the Department of Health and Family Welfare (DoHFW) and GNCTD mandated hospitals to manage mercury breakages through defined procedures and provide appropriate spill management training (see image below). To date, more than 10,000 healthcare personnel in Delhi have been trained.[8] Furthermore, senior nurse training initiatives were held in partnership with the Trained Nurses' Association of India (TNAI), which had focused on the need to shift from mercury-based instruments. The focus of this kind of training was two-fold: (i) to give hand-hold support on mercury spill management, and (ii) the need for transition to mercury-free instruments. As a result, this invariably played a significant role in changing the perception among the nurses, towards mercury. Institutions like Lady Hardinge Hospital, owing to their integrated medical and nursing colleges, incorporated mercury-free instrument usage into their formal curriculum. In contrast, some smaller facilities, like Urban Primary Health Centre (UPHC) Mehrauli and South Delhi Municipal Corporation (SDMC) Lajpat Nagar Hospital, rely on informal on-the-job guidance from senior nurses.



Annexure- I

MAHARISHI BALMIKI HOSPITAL
POOTH-KHURD, DELHI-39
GOVT. OF N.C.T. OF DELHI

No F.1/119/Estl/MBH/07 Dated

OFFICE ORDER

In pursuance of meeting held on "Use of Mercury and Health Care" on 25.05.2007 in the office of Pr. Secretary (H & F W) Govt. of NCT of Delhi followed by the workshop on "Elimination of mercury waste in health care establishments" in Department of Health & Family Welfare GNCTD it has been decided to phase out use of mercury in this hospital by December 2007.

It has been further decided to replace the equipments, instruments and consumables containing mercury in its free and hazardous form in a phased manner. To start with, all the B.P. instruments and thermometer from different sections of the hospital shall be shifted to OPD and these instruments shall be replaced by portable NIBP monitors and digital thermometers which are mercury free.

Dr. N S Khurana M O I/C BMW Management has been entrusted to workout the requirement of the different section of this hospital and get them procured at the earliest and also train the staff in using the NIBP monitor and digital thermometers.

(DR. N.V. KAMAT)
MEDICAL SUPERINTENDENT

No F.1/119/Estl/MBH/07 Dated

Copy to

1. Pr. Secretary (H & F W), GNCTD. 9th Level Delhi Secretanat New Delhi-2
2. Chairman, DPCC, GNCTD, 4th Floor, ISBT Building, Kashmere Gate Delhi-6
3. Dr. T. K. Joshi, IVPSS (COEH), B. L Taneja Block, Ground Floor MAMC Lok Nayak Hospital, New Delhi-2
4. Dy. Medical Superintendent, Maharishi Balmiki Hospital Pooth Khurd Delhi- 39
5. M O I/C, BMW, Maharishi Balmiki Hospital Pooth Khurd Delhi-39
6. A N S Maharishi Balmiki Hospital, Pooth Khurd, Delhi-39
7. Nursing Sister-Ward-I,II,III,IV, HDU, Main O. T. Nursery ICU Casually I.R and OPD Maharishi Balmiki Hospital, Pooth khurd Delhi-39

(DR. N.V. KAMAT)
MEDICAL SUPERINTENDENT

- **Private Hospitals:** In case of private healthcare facilities, situation was a little different. The NABH and Joint Commission International accreditation requirements, in general, mandate timely staff training. Training focuses on accuracy verification, spill prevention, and operational proficiency of mercury-free instruments. As observed during the survey, private hospitals used mixed approaches to train their staff, including hands-on sessions, integrated orientation and continuous medical education programmes, in-house policy communication, and ongoing staff evaluation. Some of the surveyed hospitals preferred mandatory induction training for new employees (e.g., 15–30 days structured programs at Sir Ganga Ram and Max Hospitals), whereas some of them followed Continuous Medical Education (CME) sessions (e.g. Dharamshila Narayana super-specialty hospital) for their nursing staff to enhance competency and address accuracy and other complaints.

8 https://toxicslink.org/wp-content/uploads/2022/08/Mercury_Movement_Report.pdf

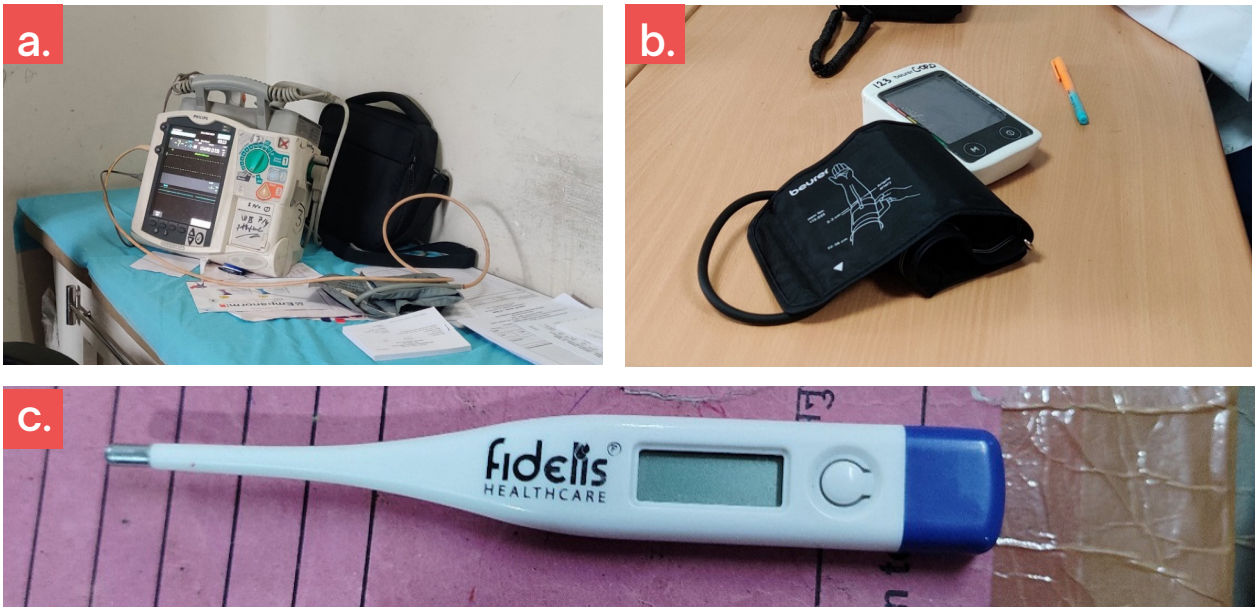
2.2.3. Procurement and Cost

In the initial days, Delhi hospitals faced challenges, including a lack of reliable non-mercury brands and difficulty in selection. Over the years, this situation evolved, and alternatives standardised by Association for Advancement of Medical Instrumentation (AAMI) and the European Society of Hypertension (ESH) started becoming widely available (e.g., Omron, Welch Allyn), addressing the accuracy issues.

- **Government Procurement:** The shift, which began nearly two decades ago with individual government hospitals, has now culminated in the government's decision to integrate mercury-free alternative instruments into its centralised procurement policies.

Government healthcare facilities rely on central procurement through tendering, which follows the General Financial Rules (GFR) 2017. In order to do so, the hospitals check for relevant Bureau of Indian Standards (BIS) and Central Drugs Standard Control Organisation (CDSCO) registration and performance/validation standards (WHO / AAMI / ESH / International Organization for Standardization (ISO) guidance). While doing so, the government hospitals are now solely focusing on mercury-free instruments and their performance evaluation.

- Central Government Hospitals procure mercury-free devices based on consolidated demands by the central procurement agency, following the bids for technical compliance and cost.
- State Government Hospitals procure mercury-free devices through state e-procurement portals or the Government e-Marketplace (GeM), prioritising Indian-made devices.
- A major directive issued on June 4, 2025, requires all state-run hospitals [including Municipal Corporation of Delhi (MCD) hospitals] to procure medical devices (including mercury-free thermometers and BP apparatus) exclusively through the Central Procurement Agency (CPA), strictly prohibiting direct GeM purchases. This order has been introduced so that prices remain standardised, hospitals do not face variations in product quality or cost, and the purchasing process becomes more transparent and easier to audit and monitor.[9]



Mercury free instruments in Safdarjang Hospital- (a) Multiparameter BP monitor; (b) Beurer digital BP apparatus; (c) Fidelis healthcare digital thermometer

9 https://economictimes.indiatimes.com/news/india/delhi-govt-bans-direct-hospital-purchases-mandates-all-procurement-through-central-agency-to-curb-inflated-prices/articleshow/121656978.cms?from=mdr

- **Private Procurement:** Private hospitals predominantly follow a centralised procurement system, especially large hospital chains, like Apollo Hospital and Max Hospital. Standalone hospitals, like Sir Ganga Ram Hospital select mercury-free instruments based on initial ward level trial run and user (mainly nurses) reviews, focusing on brand reputation and instrument accuracy.

2.2.4. Quality Check and Calibration

Quality checks ensure devices function properly within an acceptable range, while calibration configures an instrument to align with a traceable reference standard.

In the initial days, the accuracy of mercury-free devices was questioned. However, years of operation and product evolution for both mercury free thermometer and BP apparatus have helped in changing mindsets and developing trust in these alternatives. While surveying the facilities, it was found that, doctors and nursing staff were confident about use of mercury-free instruments. Most respondents also expressed the need for regular and timely calibration of these instruments and suggested half-yearly or quarterly calibration.

- **Government Hospitals:** Calibration is typically carried out twice a year by state-contracted third-party agencies, with no separate cost borne by the hospitals. Urgent needs are handled through a dedicated toll-free helpline number.

It was noted, in a few exceptional cases, that some hospitals experienced occasional accuracy concerns with digital BP instruments. However, staff clarified that such instruments were sent out for rectification by the engineering department.

- **Private Hospitals:** They prefer to maintain an Annual Maintenance Contract (AMC) with suppliers. In-house Biomedical Engineering (BME) Departments are present in the majority of the surveyed private hospitals to oversee calibration and quality assurance. Calibration is performed by the BME department biannually or as needed. Private facilities also do cross-verification like multiple readings, comparing digital readings with manual BP machines etc. but much less frequently if compared with the government hospitals. Thermometers generally do not undergo any calibration; if they become non-fuctional, they are transferred to the condemnation unit.

Delhi State	Internal Policy	Staff Training & Education	Procurement	Quality Check & Calibration
Lady Hardinge Hospital	Formal policy existed during the transition	Own medical college, therefore eliminating additional training	Tender and Central Procurement	Third-party calibration
Urban Primary Health Centre (UPHC)	Information not available	No Information	Central medical store and local purchase	Third-party calibration
Safdarjung Hospital	Formal policy existed during the transition	Central nursing training and education	Central Procurement Agency	Manufacturers if under warranty; AMC after the warranty period
SDMC Lajpat Nagar Colony Hospital	Information not available	No information	Through MCD store	Third party agency

Delhi State	Internal Policy	Staff Training & Education	Procurement	Quality Check & Calibration
Sir Ganga Ram Hospital	Formal policy existed during the transition	Preceptor training programme	Central Procurement system	In-house by BME and by manufacturers if under warranty
Indraprastha Apollo Hospital	Formal policy existed during the transition	Training and education programme	Central Procurement System	BME department when out of warranty; Manufacturer when out of warranty
Apollo Spectra Hospital	Formal policy existed during the transition	No information	Central Procurement System	In house by BME department
Dharamshila Narayana Superspeciality Hospital	Formal policy existed during the transition	In house training and CME involvement	Central Procurement System	In-House calibration and repair; AMC & CMC for big instruments
Max Hospital	Formal policy existed during the transition	Induction programme followed by an exam	Central procurement system	Third party calibration
Moolchand Hospital	Formal policy existed during the transition	No information	Bulk tendering procurement	BME department
Yupiter Hospital	Information not available	Training on monthly basis	Bulk tendering procurement	No information

03 Study Finding in Goa

Goa, a small coastal State with excellent health indicators, initiated its mercury transition journey almost a decade after Delhi, starting in 2018–2019.

3.1. Evolution and Current Status of Mercury Phase-out

Goa was selected as a model state due to its strong institutional commitment, supported by state-level directives, procurement reforms, and capacity-building initiatives. The complete elimination of mercury-based devices has been achieved across all government healthcare institutions, aligning with MoHFW guidelines from May 2010[10].

The transition commenced in 2016, with systematic replacement occurring between 2018 and 2019. Challenges included concerns over the accuracy of alternatives, resistance from users (who consider mercury instruments as the gold standard), and disposal issues.

- **Exceptions to Complete Phase-out:** Mercury-based instruments are still used for cross-verification at Sub-District Hospital (SDH) Chicalim and exclusively in the oncology ward at Goa Medical College, citing concerns over the accuracy of digital alternatives.
- **Private Sector Status:** Large corporate hospitals (e.g., Manipal Hospital, Apollo Hospital) have completely phased out mercury instruments, driven by corporate policy and centralised procurement.

  Smaller private hospitals and clinics, however, show variability, sometimes retaining older mercury-based instruments due to the belief among veteran practitioners that they represent the "gold standard," as well as the absence of strict regulations from the Goa Pollution Control Board (GPCB).

3.2.1. Internal Policy

At the state level, the Directorate of Health Services (DHS) mandated public facilities to become mercury-free.

Current mercury-free government hospitals generally do not have internal policies, though they did during the initial transition. In the private sector, NABH accreditation serves as the external driver for mercury phase-out, replacing the need for bespoke internal policy frameworks. Nobel Maternity Hospital, for example, successfully transitioned to mercury-free status from its inception in 2018 based solely on doctors' awareness of mercury toxicity, even without formal internal policies or NABH accreditation.

3.2.2. Staff Training and Education

Goa generally lacks structured training systems in most government hospitals; senior nurses provide informal, hands-on training

10 https://main.mohfw.gov.in/

to newly recruited nurses. As observed, initial resistance, particularly from nursing staff, was noted when new instruments were introduced. During the transition, targeted awareness programs were organised. Private hospitals follow structured induction programs (covering safety protocols, biomedical waste management and hands-on training) followed by examinations. New clinical staff undergo a supervised clinical practicum (2–3 months) mentored by senior staff.

3.2.3. Procurement and Cost

- **Government Hospitals:** Procurement of mercury-free instruments is centralised through the DHS and the Medical Stores Depot (MSD). Hospitals submit requirements to the DHS, which consolidates the demand for procurement via tenders (lowest bid norms) or rate contracts. The DHS is responsible for monitoring the quality, and ease of usage; however, there is currently no system in place to collect feedback on quality and accuracy of the instruments from the users. Diamond BP apparatus is currently the brand of sphygmomanometers approved to be procured by the state as most economical and categorised as L1. Local purchases are permitted only in emergencies or contingencies, requiring prior No Objection Certificate (NOC) from DHS.

- **Private Hospitals:**

    - **Centralised:** Large chains (e.g. Manipal) use a dedicated Hospital Procurement Committee to ensure standardisation, cost-effectiveness, and quality service support through bulk purchasing and negotiation.

    - **Decentralised:** Smaller facilities (Nobel Hospital, Vatsalya Hospital) use a more agile, need-based model heavily influenced by the practicing doctors' brand familiarity. Locally purchased instruments favoured brands like Diamond Liquid Crystal Display (LCD) monitor and Diamond manual BP apparatus, considered accurate and economical.

3.2.4. Quality Check and Calibration

Goa government hospitals outsource calibration to a third-party agency named Mediciti, which tests blood pressure apparatus every six months or as required. Mediciti operates under a government contract for Biomedical Equipment Management & Maintenance (BEMMP), providing preventive and corrective maintenance. Thermometers are not calibrated, once damaged such units are replaced. Nursing staff frequently express concerns over inaccuracies with digital BP apparatus. To ensure accuracy, hospitals rely on repetitive readings and cross-verification with other instruments. Selective facilities like District Hospital Hospicio and PHC Aldona maintain error reporting logbooks. This practice is significant because it helps both hospital staff and third-party monitoring agencies systematically track inaccuracies, identify recurring patterns, and take corrective measures. This system can be extremely helpful in providing feedback on quality assessment to concerned authorities when required. Other visited facilities do not have such logbook for error reporting and documentation.

Private hospitals use periodic calibration (biannually or annually). This is handled either in-house by the BME department for routine instruments (quick, cost-effective) or outsourced to certified agencies or OEMs for complex equipment. Cross-verification (using multi-para monitors or even mercury-based instruments, exceptionally) is followed to verify accuracy, for example, Manipal Hospital uses a robust "point-of-care testing (POCT)" system to cross-check readings weekly.

3.2.5. Disposal of Mercury-based Instruments

The safe disposal of phased-out mercury-based instruments remains a significant

challenge. Most government hospitals store mercury waste in storerooms due to a lack of clear state-oriented guidelines and limited awareness about proper disposal methods for mercury-based instruments. However, Community Health Centre (CHC) Bicholim takes a more responsible approach by sending its mercury-containing instruments to the Common Hazardous Waste Treatment, Storage, and Disposal Facility (CHWTSDF) in Pissurlem, Goa. The government covers the cost of collection, ensuring that the facility does not face any financial burden for safely disposing of these mercury instruments. Private hospitals also store damaged or unused mercury products securely, often unaware of recommended disposal protocols.

Goa state	Internal Policy	Staff Training & Education	Procurement	Quality Check & Calibration
Primary Healthcare Centre Loutulim	Mandate from DHS; no as such policy	Training given by Senior staff	Procurement from DHS; Local purchase in some cases	Third party calibration
Hospicio Hospital	Mandate from DHS; no such policy	Training given by Senior staff	Procurement from DHS	BME department for repairing and third-party agency for calibration
Primary Healthcare Centre Aldona	Mandate from DHS; no such policy	Training given by Senior staff	Procurement from DHS; Local purchase in some cases	Third-party calibration
Urban Health Centre Panaji	Mandate from DHS; no such policy	Training given by Senior staff	Procurement from DHS	Third-party calibration
Sub District Hospital Chicalim,	Mandate from DHS; no such policy	Training given by Senior staff	Procurement from DHS; Local purchase in some cases	Third-party calibration
CHC Bicholim	Mandate from DHS; no such policy	Training given by Senior staff	Procurement from DHS; Local purchase in some cases	Third-party calibration
CHC Sanquelim	Mandate from DHS; no such policy	Training given by Senior staff	Procurement from DHS; Local purchase in some cases	Third-party calibration and repair

Goa state	Internal Policy	Staff Training & Education	Procurement	Quality Check & Calibration
Vaatsalya Hospital	Mercury-free policy driven entirely by the doctors' own initiative	Induction programme for nursing staff	Local purchase	Outsourced calibration and repair
Manipal Hospital	Formal policy existed during the transition	3 months of induction programme followed by evaluation	Centralised procurement	In-house calibration and repair by BME
Healthway Hospital	No policy	No information	Centralised procurement	Outsourced calibration; In-house repair
Adhar Hospital	No policy	Training given by senior staff	Local purchase	Outsourced repair
Noble Hospital	Mercury free policy driven entirely by the doctors' own initiative	Training given by senior staff	Local purchase	Nursing staff calibrating manual instruments, e.g. BP apparatus
Victor Apollo Hospital	No policy	On job training for a month given to nursing staff	Centralised procurement system	In house repair by BME; Outsourced calibration by third party
SMRC's VM Salgaocar	No policy	Training given to nursing staff regularly	Centralised procurement system	In house repairing by BME; Calibration by third party
Mardolkar Hospital	No policy	Training given by senior staff	Local purchase	No information

04 Rapid Assessment Bihar

Bihar was assessed to understand the persistence of mercury devices despite national guidelines. Bihar Medical Services and Infrastructure Corporation Limited (BMSICL) is the sole procurement and distribution agency for drugs and equipment for the public health system.

Policy: Bihar Medical Services & Infrastructure Corporation Limited (BMSICL) stopped procuring mercury thermometers and sphygmomanometers in 2016, following a government notification banning their use[11]. The phase-out was gradual, replacing devices only when they became non-functional rather than through an immediate recall. Surveyed private hospitals went mercury free which was guided largely by NABH standards and their own will. Moreover, they do not have formal written policies but still voluntarily adhere to mercury-free practices.

Staff Training: Staff training is inconsistent, as experienced during the discussion at Bihar hospitals. Informal experience-based learning from senior nurses is a common practice. However, larger facilities like LNJP Hospital, Patna, demonstrated better awareness and use of mercury spill management kits.

Procurement: Procurement is centralised through BMSICL, which distributes only mercury-free equipment (Diamond and Omron BP machines). Private hospitals procure independently, relying on brands like Diamond, Helix, and Beurer.

Quality Assurance and Disposal: Calibration is typically conducted biannually or annually, depending on the type of equipment and its usage. District Hospital Chapra outsources calibration services to Mediciti. However, due to concerns regarding the accuracy and battery life of alternative devices, some hospitals continue to cross-verify readings using old mercury instruments. Disposal practices represent a major gap in the surveyed hospitals. In major government hospitals surveyed, including CHC Garkha (Saran) and CHC Bidupur, damaged or broken mercury thermometers and sphygmomanometers are stored in designated storage areas, often without adherence to a standardized disposal protocol. In one government hospital, staff reported that spilled mercury is sometimes collected using cotton and subsequently disposed of in general waste bins, indicating significant gaps in awareness and compliance with the CPCB (2012) and MoHFW (2010) guidelines.

Bihar facilities scored well in terms of transition to mercury-free alternatives, partly because the shift eliminated the challenge of spill management. State procurement departments authorised the procurement of non-mercury instruments.

11 Ministry of Health and Family Welfare (MoHFW). *Guidelines for Phasing Out Mercury in the Healthcare Sector*, 2010.

05 Rapid Assessment Kolkata, West Bengal

Kolkata was assessed to document the phase-out process within its multi-tiered healthcare network.

Policy: Both government and private hospitals lack specific in-house policies on mercury phasing out, as the transition took place long ago. Non-mercury-based instruments are very much within the hospital's centralised procurement system. The State Health and Family Welfare Department of West Bengal has now mandated procurement of the mercury-free instruments in their centralised procurement system.

Staff Training and Education: The visited private hospitals were mercury free from the beginning, which curtailed the need for any formal training for nurses on thermometer and BP instrument handling. However, as part of the initial induction of nurses, practical hands-on training on patients is mandatory, and the same is applicable not just for BP machine handling, but also for overall patient care and quality of nursing.

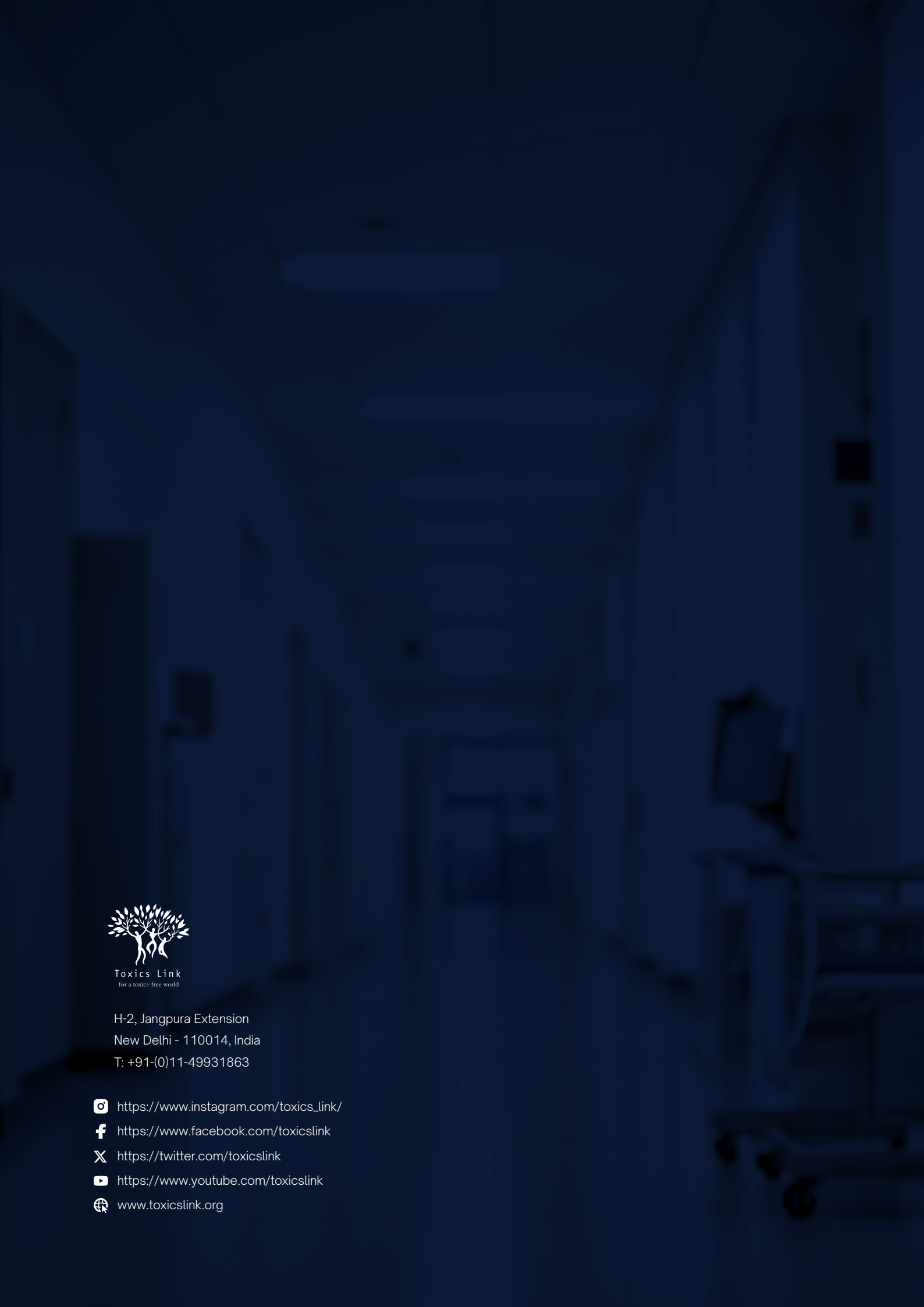
Procurement: Government hospitals rely on a central procurement system through the State Health Department's Centre for Medicare & Medicaid Services (CMS). Prices and authorised brands are fixed at the CMS level. The West Bengal Medical Services Corporation Limited (WBMSCL) manages tenders for medical equipment, which takes place through the Government e Marketplace (GeM). Sub-divisional hospitals procure through the District Reserve Store (DRS). Private hospitals (e.g., Manipal) use centralised procurement from corporate headquarters or pre-decided local vendors.

Quality Assurance and Calibration: Private hospitals have in-house BME departments that carry out monthly calibration and minor repairs. Staff nurses reported satisfaction with non-mercury instruments. According to them, perceived errors often stem from mental perception rather than device quality. Some government facilities, like a New Town UPHC, maintain one mercury-based BP instrument as a backup for cross-checking readings for critical patients. Most government facilities reported no in-house calibration or error reporting systems, as they receive few complaints.

States like West Bengal and Bihar has authorized non-mercury instruments for procurement, and corporate hospitals have transitioned.

06 Conclusion

Delhi and Goa's transition to mercury-free healthcare demonstrates the success of combining policy, staff training, and administrative support. Delhi transitioned earlier, driven by knowledge of mercury's toxicity, while Goa benefited from a more mature market of mercury-free equipment. A two-decade-old journey and associated struggle have finally secured a place for mercury-free instruments in the centralised authorised procurement system of the State Health Department of the concerned States. These success stories, along with features from Bihar and West Bengal, highlight improved product availability, systemic thinking and significant mindset change among the medical practitioners, nurses and hospital administrators towards mercury-free instruments. Though the challenges of waste disposal is still a concern to worry about, these models can still offer a blueprint for other states to shift away from mercury, protecting healthcare workers, patients, and the overall environment and public health.



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