

Lead Poisoning

A Review of the Indian Legal Framework
and International Frameworks



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Preface

Lead poisoning remains a critical and highly overlooked public health issue in India, particularly affecting our youngest and most vulnerable citizens. Despite strides made globally in reducing exposure to Lead, India faces unique challenges that necessitate a comprehensive review of our existing legal frameworks.

This report, “Lead Poisoning: A Review of Indian Legal Framework and International Frameworks,” offers a thorough examination of the current state of laws and regulations in India, and how they measure up against international standards and best practices. The report seeks to highlight the areas where Indian legal structures can be strengthened and to provide a clear path forward for policymakers and stakeholders dedicated to eradicating Lead poisoning in our country.

Through meticulous research and analysis, this study not only evaluates the effectiveness of the current legal mechanisms in place but also proposes design principles for future legislative actions. These recommendations are intended to enhance the robustness of our legal frameworks and ensure they are aligned with both national priorities and international commitments.

To address the multifaceted challenge of Lead poisoning, the report outlines several important recommendations. It proposes enhancing regulatory oversight by conducting periodic reviews and updates of legal provisions to align with the evolving understanding of Lead toxicity and its sources. Strengthening enforcement mechanisms is crucial, which includes improving surveillance, monitoring, and imposing stringent punitive measures to deter violations and promote compliance across industries. The report advocates for the adoption and adaptation of international best practices, tailored to the unique context of India, to enhance the effectiveness of our legal framework and ensure alignment with global standards.

The findings and recommendations presented in this report are timely and relevant, especially as India continues to grapple with the health and developmental impacts of Lead exposure. By learning from international experiences, we can significantly reduce the incidence of Lead poisoning and protect the health of our citizens, particularly our children.

Finally, I would like to express my deep appreciation to Ankeeta Maheshwari who has worked tirelessly to bring this report to fruition. I am profoundly grateful to Vidhi Centre for Legal Policy for their invaluable contributions and support in preparing this report. Their insights and expertise have been invaluable in crafting a document that we hope will serve as a crucial resource for those committed to making India a safer and healthier place for all.

- **Indu Bhushan**

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**Executive
Summary**

Recognizing the law's critical role in addressing the issue of Lead (Pb) toxicity, this first-of-its kind study consolidates Indian laws, rules, regulations and directives related to Lead. We also evaluate the legal framework's effectiveness using design principles for legislative intervention.

The study reviews international legal frameworks to propose recommendations for India to combat Lead poisoning and protect its demographic dividend. By thoroughly examining India's legal landscape and incorporating global insights, this study aims to equip policymakers, stakeholders, and advocacy groups with actionable strategies to mitigate Lead poisoning and promote a healthier, sustainable future.

Although India completely phased out Leaded petrol by 2000,¹ there is no dedicated legislative framework specifically targeting Lead toxicity at present. Various laws and regulations do, however, address the issue, either directly or indirectly.

No law can be considered ideal, as various legal theories offer different foundations. To evaluate the effectiveness of the Indian legal framework in preventing Lead poisoning, we developed our own standard - a set of design principles for a law that successfully prevents and mitigates Lead toxicity.

Drawing from various legal theories and the UNEP Lead Paint Model Law², these design principles balance general legal robustness with sector-specific needs. These principles have been used to assess the adequacy of India's legal framework in preventing Lead poisoning, identifying both strengths and areas for improvement.

The legal frameworks of countries like Japan, the United Kingdom, South Africa, United States, Australia, and the European Union have been reviewed to provide valuable insights that could be used to strengthen our own legal framework. These countries were selected because they either have successfully achieved low levels of Lead poisoning in their populations or have implemented distinctive laws that set them apart.

Our recommendations, based on the results of the testing of India's legal framework against the design principles and international legal frameworks, are intended to offer crucial inputs for policymaking in the area of mitigating Lead toxicity. These recommendations vary from potentially transformative actions to more targeted suggestions addressing specific issues, yet each one is significant in its own right.

Given the adverse impacts of Lead poisoning especially on children and other vulnerable groups, we strongly believe that tackling Lead poisoning should be among the government's top public health priorities to ensure a healthier future for the nation.

1. MoPNG, Gasoline (Leaded Petrol) Amendment Order, 1998, [https://mopng.gov.in/files/marketing/distribution/GSR772\(E\)28.12.1998\(MainOrder\).pdf](https://mopng.gov.in/files/marketing/distribution/GSR772(E)28.12.1998(MainOrder).pdf)

2. UNEP and Global Alliance to Eliminate Lead Paint, (2017), Model Law and Guidance for Regulating Lead Paint, https://wedocs.unep.org/bitstream/handle/20.500.11822/22417/Model_Law_Guidance_%20Lead_Paint.pdf?sequence=7



01

Introduction

Heightened awareness and scientific research have shed light on the detrimental effects of Lead (Pb) exposure on human beings. Notwithstanding the increased awareness, Lead poisoning in India remains an under-reported and underfunded public health issue posing a significant threat to the population and environment³.

According to a 2020 report by UNICEF and Pure Earth, half of India's children are reported to have elevated blood Lead levels. The report indicates that as many as 275 million children surpass the WHO threshold for intervention set at 5 µg/dL for blood Lead levels, with 64.3 million of them exceeding 10 µg/dL. Subsequently, in 2022, CSIR-NEERI published a report titled 'Assessment of Lead Impact on Human and India's Response,'⁴ confirming the UNICEF data and offering suggestions for reducing Lead exposure among the Indian population. WHO, the CSIR-NEERI study and the UNICEF report highlight a significant public health concern in India stemming from Lead poisoning, particularly among children.

Recognizing the law as a pivotal tool for change, this first-of-its-kind study consolidates Indian laws, rules, regulations and directives concerning Lead. It also evaluates the country's legal-regulatory framework by testing it against design principles developed for legislative intervention aimed at regulating Lead poisoning. These design principles are intended to assess whether the current legal framework is adequately robust to prevent and mitigate Lead poisoning.

Additionally, this study reviews legal frameworks of a few countries with either low levels of Lead poisoning or distinctive laws that set them apart from others. By synthesising insights from international legal frameworks, we put forth recommendations suggesting the next steps for India to combat Lead poisoning and prevent the potential degradation of our demographic dividend. In the process of examining the current legal framework governing Lead toxicity in India, and juxtaposing it with global perspectives, the study aims to offer a nuanced understanding of the challenges and opportunities in addressing Lead poisoning on the domestic front while drawing lessons from international successes.

In essence, through a comprehensive examination of primary and subordinate Indian legislations supplemented by international perspectives, this paper is an endeavour to provide policymakers, stakeholders and advocacy specialists with actionable insights to help mitigate the impact of Lead poisoning and pave the way for a healthier, more sustainable future.

3. Taran Deol, (2023, Jan 12), Element of mystery: Lead poisoning is a huge public health concern for India; here's why, 2023, <https://www.downtoearth.org.in/health/element-of-mystery-Lead-poisoning-is-a-huge-public-health-concern-for-india-here-s-why-87098>

4. CSIR-NITI Aayog - Assessment Of Lead Impact On Human And India's Response, 2022



02 Current Indian Legal Framework

India faces significant challenges regarding Lead poisoning. WHO states that no amount of Lead exposure is known to be harmless⁵. There is no established safe blood Lead level (BLL). Even levels as low as 3.5 µg/dL may be linked to reduced intelligence, behavioural issues, and learning difficulties in children⁶. In such a scenario, it becomes even more important to have a robust legal framework on the basis of which testing, mitigation, prevention and awareness campaigns for prevention and mitigation of Lead poisoning can be built. While India phased out Leaded petrol completely by 2000⁷, currently no specific comprehensive legislative framework is dedicated to combating Lead poisoning, though several laws and regulations contribute to addressing this issue directly or indirectly. These include but are not limited to the following:

Primary Legislation

- ▶ The Bureau of Indian Standards Act, 2016
- ▶ The Food Safety and Standards Act, 2007
- ▶ The Environment Protection Act, 1986
- ▶ The Consumer Protection Act, 1986
- ▶ The Child Labour Act, 1986
- ▶ The Insecticides Act, 1968
- ▶ The Code of Practice for Water Supply in Buildings, 1957
- ▶ The Factories Act, 1948
- ▶ The Drugs and Cosmetics Act, 1940

Subordinate Legislation

- ▶ The Batteries Waste Management Rules, 2022 (part of Environment Protection Act 1986)
- ▶ The Lead Stabiliser in Polyvinyl Chloride (PVC) Pipes and Fittings Rules, 2021
- ▶ The Drugs and Cosmetics Rules, 2020
- ▶ The Consumer Protection, Rules 2019
- ▶ The Child Labour Amendment Rules, 2017 (a part of The Child Labour Act, 1986)
- ▶ The Regulation of Lead Contents in Household and Decorative Paints Rules, 2016 (a part of Environment Protection Act, 1986)
- ▶ The Hazardous Waste Management Rules, 2016 (a part of Environment Protection Act, 1986)
- ▶ The Food Safety and Standards Regulations, 2011 (a part of Food Safety and Standards Act, 2007)
- ▶ The Environment Protection Rules, 1986 (a part of Environment Protection Act, 1986)

The Environment Protection Act and The Environment Protection Rules, 1986

This legislation establishes the framework for regulating activities that affect the environment, including those contributing to Lead pollution. It authorises the central government to implement measures for protecting and enhancing environmental quality and provides permissible limits on Lead content in 25+ effluents and pollutants.⁸

Implementation authority



The Central Pollution Control Board is the nodal agency for implementation of these rules.

The Factories Act, 1948

In India, the Factories Act, 1948⁹, contains several indirect provisions to ensure worker's health and safety, which can help mitigate Lead poisoning in factories where Lead is used. Chapter III of this Act focuses on the health of factory workers. It encompasses provisions to ensure the worker's safety, welfare and hygiene of workers within factory premises.

5. WHO, (2023), Lead Poisoning, <https://www.who.int/news-room/fact-sheets/detail/Lead-poisoning-and-health>

6. Ibid

7. MoPNG, Gasoline (Leaded Petrol) Amendment Order, 1998, [https://mopng.gov.in/files/marketing/distribution/GSR772\(E\)28.12.1998\(MainOrder\).pdf](https://mopng.gov.in/files/marketing/distribution/GSR772(E)28.12.1998(MainOrder).pdf)

8. (Environment Protection Rules, 1986)

9. (The Factories Act, 1948)

Implementation authority

The Chief Inspectors are responsible for the implementation of these rules.

The Code of Practice for Water Supply in Buildings, 1957 and Lead Stabiliser in Polyvinyl Chloride (PVC) Pipes and Fittings Rules, 2021

The Bureau of Indian Standards formulated this code and laid down the standard for the design, installation and maintenance of water supply systems in buildings¹⁰. It was last reviewed and revised in 1983¹¹. It covers various aspects relating to water supply. As far as Lead is concerned, the Code says the following:

- ▶ Lead piping shall not be used to convey domestic water supply as it is liable to cause Lead poisoning.
- ▶ Lead piping may, however, be used for flushing and overflow pipes.
- ▶ As Lead pipes are liable to corrosion on contact with fresh cement mortar or concrete, they shall be protected by wrapping with a protective material that permits movement due to expansion and contraction.
- ▶ Lead-lined tanks shall not be used¹².

The permissible limit of Lead in water bodies is 10 µg/L according to the Bureau of Indian Standards¹³.

The Lead Stabiliser in Polyvinyl Chloride (PVC) Pipes and Fittings Rules, 2021¹⁴, prohibits using Lead-based stabilisers in PVC pipes and fittings to safeguard human health and the environment. Manufacturers must transition to safer alternatives within a specified timeline and ensure their products meet set standards. Certification and regular testing are required to demonstrate compliance, with penalties for non-compliance. The rules emphasise awareness and education about the dangers of Lead and the benefits of Lead-free alternatives, while government agencies are responsible for monitoring and enforcing these regulations. These Rules were further amended in 2022¹⁵. In the amendment, manufacturers of unlicensed PVC pipes and fittings without a Bureau of Indian Standards mark must submit a water quality test report. They must adhere to Indian standard specifications and Lead detection limits of 10 µg/L for the first extraction and 5 µg/L for the third extraction as specified in the Schedule to the amended rules.

Implementation authority

State Pollution Control Board (SPCB) and Pollution Control Committee (PCC) are the nodal agencies responsible for the implementation of these laws and rules.

The Insecticides Act, 1968

The Insecticides Act, 1968 regulates the import, manufacture, sale, transport, distribution, and use of insecticides to ensure their safety and efficacy. It includes provisions for the testing and registering of insecticides, which may contain chemicals harmful to human health, including Lead compounds. Schedule 2 of the Act which lists all insecticides lists Lead Arsenate as an insecticide.

Implementation authority

Insecticide Inspectors are responsible for the implementation of these rules.

The Food Safety and Standards Act, 2006 (FSSA) and Regulations, 2011

This Act besides establishing the Food Safety and Standards Authority of India, empowers it to lay down standards for food and food articles. Its primary objective is to guarantee the accessibility of safe and

10. "Indian Standard Details." IS Details, www.services.bis.gov.in/php/BIS_2.0/bisconnect/standard_review/Standard_review/Isdetails?ID=Mjg3NQ. Accessed 22 Apr. 2024.

11. Ibid

12. (Code of Practice for Water Supply in Buildings, 1957)

13. Published Standards: (WRD)

14. (Lead Stabilizer in Polyvinyl Chloride (PVC) Pipes and Fittings Rules, 2021)

15. (Parliamentary Debates, 2022)

nutritious food for human consumption, along with addressing related concerns and issues¹⁶. Regarding Lead specifically, the FSSA, 2006, and its associated regulations, particularly the Food Safety and Standards (Contaminants, Toxins, and Residues) Regulations, 2011, address the permissible limits of contaminants in food, including Lead.

These regulations set maximum permissible limits for various contaminants, including heavy metals like Lead, in different food products (some of which are listed in the table below). The limits are based on scientific evidence and international standards¹⁷.

Table I

Product	Lead limit (ppm)
Turmeric whole and powder	10
Leafy vegetable	0.3
Vegetable oil	0.1
Pulses	0.2
Sugar	5.0
Infant milk substitute and infant food	0.2
Fish	0.3
Cattle meat	0.1

While the maximum permissible limit for Lead in drinking water is 0.01mg/l and this limit has been set by Bureau of Indian Standards¹⁸. It's noteworthy that FSSAI has issued guidelines to prevent the use of Lead Chromate¹⁹, the most common adulterant used to improve colour and weight in spices due to its ill-effects²⁰.

Implementation authority



Food Safety and Standards Authority of India (FSSAI) is the nodal agency.

The Hazardous Waste Management Rules, 2016 (a part of Environment Protection Act) and The Batteries Waste Management Rules, 2022. The 2016 Rules provide rules for hazardous substances including Lead²¹

The rules first of all classify Lead-containing wastes generated from various sources. These also provide for the safe storage and handling of hazardous wastes, including measures to prevent leakage, spillage, or unauthorised access. Treatment methods of such wastes aim to reduce the waste's toxicity or volume of the waste. At the same time, disposal options depend on the nature of the waste and its potential environmental impacts.

Facilities involved in generating, handling, treating, or disposing of hazardous wastes, including those containing Lead, must obtain authorization from the State Pollution Control Boards or Pollution Control Committees, as per the rules. They must also comply with specific regulatory requirements and standards to ensure the safe and environmentally sound management of hazardous wastes. Producers, too, are required to implement measures to minimise waste generation, segregate hazardous wastes and ensure their safe handling and disposal.

Implementation authority



The Ministry of Environment, Forest and Climate Change will serve as the nodal agency for managing the transboundary movement of hazardous and other wastes, in compliance with the provisions of these rules.

16. (Food Safety and Standards Act, 2006)

17. Contaminants_regulations, www.fssai.gov.in/upload/uploadfiles/files/Contaminants_Regulations.pdf. Accessed 23 Apr. 2024. 18. (Bureau of Indian Standards, 2024)

19. Lead chromate is a toxic chemical that poses serious health risks when inhaled, ingested, or absorbed through the skin. Prolonged exposure to Lead chromate can result in kidney and liver damage, reproductive issues, and neurological harm. Additionally, it can cause skin irritation and respiratory problems.

20. Toxics Link, Lead Chromate, Nov 2023

21. (Hazardous and other Waste Management Rules, 2016)

Batteries Waste Management Rules, 2022 states the following relating to recycling of batteries including Lead-acid batteries²²

These rules apply to producers, dealers, consumers, and entities involved in various stages of waste battery management. However, batteries used in specific security-related equipment or those designed for space exploration are excluded.

The highlight of these rules is “extended producers’ responsibility”. This approach holds manufacturers responsible for the environmental impact of their products, even after the products have reached the end of their useful life. Thus, they must ensure that the batteries they introduce into the market are either recycled or refurbished. Additionally, producers must incorporate a minimum amount of domestically recycled materials into new battery production. However, this provision does not transfer the obligation, the Extended Producer Responsibility (EPR) targets shall remain with the producer.

The consumers, too, are tasked with responsibly discarding waste batteries. Public waste management authorities have been given the ultimate responsibility for transferring collected waste batteries to producers or designated agencies for refurbishment or recycling. Recovery targets have also been set. Compulsory registration of recyclers and refurbishers with State Pollution Control Boards is also one of the provisions. Additionally, based on the polluter’s pay principle, the producers shall be liable to pay compensation in case of violations, such as operating without registration, providing false information, or mishandling waste batteries. However, payment of environmental compensation does not absolve producers of their EPR obligations.

Implementation authority



The Central Pollution Control Board, which comes under the ambit of the Ministry of Environment, Forests and Climate Change, is supposed to establish an Implementation Committee in accordance with Rule 15 to ensure the effective enforcement of these rules and to provide recommendations for strengthening the process.

The Regulation of Lead Contents in Household and Decorative Paints Rules, 2016 (a part of the Environment Protection Act)

According to these rules,²³

- ▶ No one can make, sell, import, or export paints with more than 90 ppm of Lead for homes or decorations.
- ▶ Paints made or imported before these rules started can still be sold for two years from the start date of the rules.
- ▶ Manufacturers or importers must test their paints yearly to ensure they meet the Lead limit before selling them. They must get the testing done by authorised agencies only listed in Rule 6.

Additionally, the Central Pollution Control Board has a procedure for measuring Lead in these paints, which it notified in 2017.

Implementation authority



The Central Pollution Control Board is the nodal agency here.

The Drugs and Cosmetics Act, 1940 and Cosmetics Rules, 2020

As per the Cosmetics Rules, 2020²⁴, the maximum permissible limit for Lead in cosmetics is set at 20 parts per million (ppm). Manufacturers and importers must comply with these regulations and ensure that their cosmetic products do not exceed the specified limit of Lead content. Additionally, they must properly label their products with ingredient information and adhere to other labelling requirements outlined in the Cosmetics Rules.

22. (Batteries Waste Management Rules, 2022)

23. (Regulation on Lead contents in Household and Decorative Paints Rules, 2016)

24. (The Cosmetics Rules, 2020)

25. (Consumer Protection Act, 1986 and Rules 2022)

26. (Bureau of Indian Standards, 2024)

Implementation authority

Central Licensing Authority (for licensing and import) and Controlling Officers and Inspectors (for inspection of the products) are the nodal agencies. All these agencies come under the ambit of the Central Drugs Standard Control Organization (CDSCO).

The Consumer Protection Act and Rules, 1986 and Rules 2019

The Consumer Protection Act (CPA)²⁵, aims to protect the interests of consumers ensuring product safety and standards, safety from misleading advertising and labelling, providing for consumer awareness and education along with redressal of consumer complaints, and establishing consumer councils and other authorities to settle consumer disputes.

Implementation authority

Central Consumer Protection Authority established under this Act is the nodal agency.

The Child Labour Act, 1986, Amendment Rules, 2016 and Amendment Rules, 2017

The Prohibition of Child Labour Act of 1986 in itself might not directly mitigate Lead poisoning. Yet, it plays a crucial role in safeguarding children from hazardous work environments where they might be exposed to Lead, especially in informal sectors or small-scale industries.

As per the amendment of 2016, the Indian government will impose harsher penalties on employers found guilty of breaching the Act. The amendment of 2017 ensures the prevention, prohibition, rescue, and rehabilitation of both child and adolescent labourers. It also establishes clear duties and responsibilities for law enforcement bodies to guarantee the Act's effective enforcement and adherence.

Implementation authority

The District Magistrate is the one responsible for the implementation of these Rules.

The Bureau of Indian Standards Act, 2016

The Bureau of Indian Standards is the National Standards Body of India, established under the Bureau of Indian Standards Act, 2016. Its purpose is to facilitate the harmonious development of standardisation, marking, and quality certification of goods, as well as related matters²⁶. The permissible limits of Lead in kitchenware that comes in contact with food are given in the table below.²⁷

Table 2

Product	Lead limit
Cooking ware	0.5 mg/dm ²
Flatware	0.8 mg/dm ²
Cups and mugs	0.5 mg/l
Small hollow ware	2.0 mg/l
Large hollow ware	1.0 mg/l
Storage hollow ware	0.5 mg/l

Implementation authority

The Bureau of Indian Standards is the nodal agency here.

27. (Methods of Test for and Permissible Limits of Toxic Materials Released from Ceramic Ware, Vitreous Enamelware, Glassware and Glass-Ceramic Ware in contact with Food (First Revision), 2001)



03 Design Principles

There is no such thing as an ideal law. Various theories of law, such as Natural Law Theory, Positive Law Theory, Marxist Law Theory, and Realist Theory of Law, offer different foundations, yet none provide a perfect set of design principles to ensure a law's robustness. To create a benchmark for assessing the effectiveness of laws in preventing and mitigating Lead poisoning, we devised our own standard.

We started by understanding the problem, then discussed the characteristics needed in a law to address Lead poisoning. These features included addressing all sources of Lead, fostering cooperation among relevant authorities, being proactive and preventive, and having the flexibility to evolve with market needs.

Combining insights from different legal theories, we brainstormed additional features and ultimately developed a set of design principles aimed at crafting a robust law to prevent and mitigate Lead poisoning. We also took inspiration from "UNEP Lead Paint Model Law"²⁸.

The design principles outlined below illustrate what a robust law for regulating Lead poisoning would look like. They take into account both:

- ▶ General, sector-agnostic principles for a robust law (e.g. alignment with international law, legislative competence etc.)
- ▶ Sector-specific issues pertaining to the current state of play of regulation of Lead toxicity (e.g., the need for coordination between multiple agencies and the need to avoid a disproportionate impact on the ease of doing business).

The aforementioned Indian legal framework will be evaluated against these design principles testing their robustness for preventing and mitigating Lead poisoning. According to our research, while most of the primary and subordinate legislations align with the Design Principles in order to prevent and mitigate Lead poisoning, certain ones mentioned in the analysis part of the Design Principles do not. These discrepancies have been analysed under the relevant principles. It is noteworthy that most primary and subordinate legislations are adequate; any necessary changes are clearly specified.

Table depicting the primary and subordinate legislations aligning and not aligning with the Design Principles

Table 3

Laws	Design Principle 1	Design Principle 2	Design Principle 3	Design Principle 4	Design Principle 5	Design Principle 6	Design Principle 7	Design Principle 8	Design Principle 9
Primary Legislations									
The Bureau of Indian Standards Act, 2016	✓	✓	✓	✓	✓	✓	✓	✓	
The Food Safety and Standards Act, 2007	✓	✓	✓	✓	✓			✓	
The Environment Protection Act, 1986				✓	✓		✓	✓	
The Consumer Protection Act, 1986	✓	✓	✓	✓	✓	✓	✓	✓	
The Child Labour Act, 1986	✓	✓	✓	✓	✓	✓	✓	✓	
The Insecticides Act, 1968	✓	✓	✓	✓	✓	✓	✓	✓	
The Code of Practice for Water Supply in Buildings, 1957	✓	✓	✓	✓		✓	✓	✓	

28. UNEP and Global Alliance to Eliminate Lead Paint, (2017), Model Law and Guidance for Regulating Lead Paint, https://wedocs.unep.org/bitstream/handle/20.500.11822/22417/Model_Law_Guidance_%20Lead_Paint.pdf?sequence=7

Laws	Design Principle 1	Design Principle 2	Design Principle 3	Design Principle 4	Design Principle 5	Design Principle 6	Design Principle 7	Design Principle 8	Design Principle 9
The Factories Act, 1948	✓	✓	✓	✓	✓		✓	✓	
The Drugs and Cosmetics Act, 1940	✓	✓	✓		✓	✓	✓	✓	
Secondary Legislations									
The Batteries Waste Management Rules, 2022 (part of Environment Protection Act 1986).	✓	✓	✓	✓	✓	✓		✓	
The Lead Stabiliser in Polyvinyl Chloride (PVC) Pipes and Fittings Rules, 2021	✓	✓	✓	✓	✓	✓	✓	✓	
The Drugs and Cosmetics Rules, 2020	✓	✓	✓		✓	✓	✓	✓	
The Consumer Protection, Rules 2019	✓	✓	✓	✓	✓	✓	✓	✓	
The Child Labour Amendment Rules, 2017 (a part of The Child Labour Act, 1986)	✓	✓	✓	✓	✓	✓	✓	✓	
The Regulation of Lead Contents in Household and Decorative Paints Rules, 2016 (a part of Environment Protection Act, 1986)	✓	✓	✓	✓	✓	✓		✓	
The Hazardous Waste Management Rules, 2016 (a part of Environment Protection Act, 1986)	✓	✓	✓	✓	✓	✓	✓	✓	
The Food Safety and Standards Regulations, 2011 (a part of Food Safety and Standards Act, 2007)	✓	✓	✓	✓	✓			✓	
The Environment Protection Rules, 1986 (a part of Environment Protection Act, 1986)	✓	✓	✓	✓	✓	✓	✓	✓	

Rationale of all Design Principles and analysis of the primary and subordinate legislations not in alignment with the Design Principles to prevent and mitigate Lead poisoning

DESIGN PRINCIPLE 1

The law should ensure coordination among all relevant regulators

Rationale

From a preliminary analysis, there are a total of 9 pieces of primary legislation (Acts) as well as 9 pieces of subordinate legislation (rules, regulations, orders, notifications etc.) which directly or indirectly pertain to and/or regulate Lead toxicity. Each of these primary and secondary instruments are administered and enforced by a wide range of regulators such as the Ministries and Departments of the Central and State Governments as well as statutory agencies - both at the central as well as the state level.

It is worth noting that by itself, this is not a shortcoming. By its very nature, Lead toxicity is a cross-sectoral problem - it is a public health and an environmental issue, but it is equally a labour and a consumer issue. As such, the participation of multiple regulators is inevitable. What the law must prevent, however, is the functioning of these regulators in silos. A whole-of-government approach is necessary.

A legal framework which establishes a coordination forum for all relevant regulators to meet on a periodic basis to keep each other apprised of developments in their relevant sectors, to clearly delineate their scope of powers so as to prevent overlaps and conflicts in regulation, and to take joint action where necessary is needed. It is worth noting that this forum should only function as a platform for regulatory coordination, and not as a new regulatory agency in and of itself.

Analysis

As seen from the aforementioned table, all 18 primary and subordinate legislations may not require to be the coordination forum, these two legislations definitely need to be, given that they are the apex legislations:

- ▶ The Environmental Protection Act and Rules, 1986 bestows the Central government with various powers. However, there is no mention of coordination between different government departments to prevent and mitigate Lead poisoning, even though coordination between the Central Pollution Control Board (CPCB) and the State Pollution Control Board (SPCB) has been mentioned.
- ▶ The Factories Act allows for appointing Inspectors with the authority to enforce the Act's provisions. While it emphasises internal coordination, its alignment with other relevant environmental and health regulators isn't explicitly mandated.

DESIGN PRINCIPLE 2

The law should have a strong signalling effect

Rationale

Lead toxicity is a critical issue with ramifications across various sectors - environmental regulation, public health, labour laws, consumer rights etc. In addition to the immediate harms, such as the loss of life and the strain on the public health system, the long-term socio-economic losses which a country sustains due to Lead exposure make this a pressing item on the regulatory agenda. By its very nature, subordinate legislation, such as rules and regulations, is far less prominent than primary legislation. A dedicated chapter to tackle Lead toxicity in a statute will have a strong signalling effect across three classes: potential victims of Lead toxicity; second, businesses whose operations may contribute to Lead toxicity; and third, regulatory agencies who are responsible for curbing Lead toxicity.

However, it has become clear that despite sustained attempts at regulating Lead toxicity - e.g. legally binding controls on the level of Lead in paint - the issue has not received sufficient prominence. This is evident from the low efficacy and sub-optimal enforcement of instruments such as the Regulation of Lead Contents in Household & Decorative Paints Rules, 2016 and the Lead Stabilizer in Polyvinyl Chloride (PVC) Pipes and Fittings Rules, 2021.

Analysis

As seen from the aforementioned table, out of the 18 primary and subordinate legislations these four legislations are not in alignment with Design Principle 2:

- ▶ While the Environmental Protection Rules, 1986 mentions Lead and its permissible limits, the Act itself doesn't acknowledge Lead poisoning separately. Instituting Rules on Lead poisoning may give a stronger signalling effect.

- ▶ The Factories Act, 1948 signals a strong commitment to worker health and safety by setting standards for working conditions, including exposure to hazardous substances like Lead. However, there are no provisions directly addressing Lead poisoning.
- ▶ While “Lead Arsenate” falls under the category of “Pesticides Refused Registration”, the Insecticides Act, 1986, however, still lists it as an insecticide, thereby sending a very weak signalling effect²⁹.
- ▶ Batteries Waste Management Rules, 2022 has banned the non-licensed smelters/recyclers but current/ongoing research states that nearly 90 percent of ULABs end up in the informal recycling sector³⁰.

DESIGN PRINCIPLE 3

The law should provide for regulatory impact assessment

Rationale

Regulatory impact assessment is a hallmark of modern regulatory design. It refers to studying the potential or actual impact of a legal framework by, among other things, benchmarking them against their stated objectives. Regulatory impact assessment can be undertaken at two stages - before the proposed framework is introduced (ex-ante) and after the framework has been enforced for a particular period (ex-post). The former enables the regulator to seek inputs from all relevant stakeholders to ensure that the framework is well-informed and evidence-based, while the latter ensures that the efficacy of the framework can be tested at periodic stages and appropriately modified to better achieve the objectives. Regulatory impact assessment will be a useful addition to the current regulatory landscape on Lead toxicity.

Analysis

As seen from the aforementioned table, the following three legislations need to have greater regulatory impact assessment:

- ▶ There is no visible regulatory impact assessment in Environmental Protection Act and Rules, 1986.
- ▶ The Factories Act, 1948 itself does not mandate a formal regulatory impact assessment.
- ▶ Regulation of Lead Contents in Household and Decorative Paints Rules, 2016 (a part of the Environment Protection Act) mandates periodic reviews and assessments to evaluate its effectiveness. However, specific details on how these assessments are conducted and their frequency are not explicitly stated, which might indicate a need for a more structured impact assessment framework.

DESIGN PRINCIPLE 4

The law should align with India’s obligations under international law

Rationale

Every domestic legislation must be consistent with treaties and agreements that India has committed to internationally, ensuring compliance with global standards and norms. At the same time, the law should be crafted to support and enhance India’s position in the global market, fostering an environment that encourages trade, attracts foreign investment, and promotes economic growth. By balancing these considerations, India can strengthen its international relationships and economic standing while upholding its commitments and fostering sustainable development.

When it comes to permissible limits of Lead in drinking water³¹, turmeric³², fish³³, and cookware³⁴ (including flatware, cups & mugs, small hollow ware, large hollow ware, storage hollow ware), India is in sync with the international standards as mentioned by WHO, Food and Agriculture Organisation (FAO) and US Food and

29. (List Of Pesticides Which Are Banned, Refused Registration And Restricted In Use, 2019)

30. Toxics Link, Loaded Leaded Batteries Mapping The Toxic Waste Trail, 2019

31. FAO and WHO, (2021), Code Of Practice For The Prevention And Reduction Of Lead Contamination In Foods, https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252Fstandards%252FCXC%2B56-2004%252FCXC_056e.pdf

32. Angelon-Gaetz KA & others, (2018, Nov 24), Lead in Spices, Herbal Remedies, and Ceremonial Powders Sampled from Home Investigations for Children with Elevated Blood Lead Levels — North Carolina, Weekly, <https://www.cdc.gov/mmwr/volumes/67/wr/mm6746a2.htm#suggestedcitation>

33. FDA, (2022), Fish and Fishery Products Hazards and Controls Guidance, <https://www.fda.gov/media/80637/download>

34. (FDA Food Code, 2022)

Drug Administration (FDA). While permissible Lead limits are not available for most of the Indian food items, given the cultural difference, India is in sync with the international standards on most of them. On the other hand, Lead limit in cosmetics in India is 20 ppm³⁵ while WHO permits only 10 ppm³⁶. As far as pipes and paints are concerned, the laws relating to them came into being because of India's international obligations.

Analysis

As seen from the aforementioned table, the following three legislations out of 18, need to conform with international standards:

- ▶ India is a signatory to nearly all major international conventions, including the Stockholm Convention, Basel Convention, the Convention on Biological Diversity and The Rotterdam Convention, thereby affirming her obligations towards protecting the environment. However, even then the Factories Act, 1948 does not provide for something similar as Occupational Safety and Health Administration (OSHA) standards.
- ▶ Although India is not a formal partner of the Global Alliance to Eliminate Lead Paint³⁷ (a voluntary collaborative unit under the aegis of the UNEP and WHO, four non-governmental organisations and one university from India have joined the Alliance as collaborators. Twenty-one countries have formally joined the Alliance as partners. This Alliance serves as a platform for a wide range of stakeholders from multiple jurisdictions to collaborate and coordinate - enabling, inter alia, the exchange of information and best practices, as well as collective action. To ensure that it takes a coordinated and well-informed approach to tackling the issue of Lead paints, India may consider joining this Alliance. Even while India remains formally outside the fold of the Alliance and while regulating Lead toxicity beyond the ambit of Lead paints, it should ensure that the legal framework in question is in furtherance of India's international obligations in areas such as child rights, labour rights, the rights of pregnant women etc. as well as being compatible with the relevant Sustainable Development Goals.
- ▶ Lead limit in cosmetics in India is 20 ppm³⁸ while WHO permits only 10 ppm³⁹. Thus, a change needs to be made in Drugs and Cosmetics Rules, 2020.

DESIGN PRINCIPLE 5

The law should effectively deal with non-compliance

Rationale

Each legal instrument that regulates Lead toxicity should have an entity that assesses compliance, and investigates and penalises instances of infraction. Where necessary, an appellate mechanism should be put in place to ensure that the regulated entities have an adequate opportunity of being heard. Instead of criminal punishments (fine and/or imprisonment), the law should first seek to impose civil penalties (such as monetary penalties which may be recovered as arrears of land revenue or income tax dues), as well as alternative punishments such as compliance notices, suspension/cancellation of licences/certificates as these have proved to be more effective tools while regulating corporate conduct. It should also follow a system of staggered penalties - i.e. more onerous penalties are imposed for repeat or continuing offences.

Analysis

The 18 primary and subordinate legislations mention some sort of action (most are criminal or monetary and not alternative punishments as suggested) against non-compliance except for this one:

- ▶ The Code of Practice for Water Supply in Buildings, 1957 does not address non-compliance at all.

35. (The Cosmetics Rules, 2020)

36. Alam, M.F., Akhter, M., Mazumder, B. et al. (2019). Assessment of some heavy metals in selected cosmetics commonly used in Bangladesh and human health risk. *J Anal Sci Technol* 10, 2 (2019). <https://doi.org/10.1186/s40543-018-0162-0>

37. <https://www.unep.org/topics/chemicals-and-pollution-action/pollution-and-health/heavy-metals/global-alliance-eliminate>

38. (The Cosmetics Rules, 2020)

39. Alam, M.F., Akhter, M., Mazumder, B. et al. (2019). Assessment of some heavy metals in selected cosmetics commonly used in Bangladesh and human health risk. *J Anal Sci Technol* 10, 2 (2019). <https://doi.org/10.1186/s40543-018-0162-0>

DESIGN PRINCIPLE 6

The law should provide for self-regulation or surrogate regulation (regulation through market mechanisms) wherever feasible

 **Rationale**

In modern regulatory design theory, agencies often shift the regulatory burden onto the market - relying on market forces to promote compliance. This can be achieved in a variety of ways. Self-regulation can be achieved by providing a set of benefits (in the form of subsidies, access to credit etc.) to incentivise compliance. Regulation by the market can be achieved by shifting a portion of the burden further down the value chain. For example, if in addition to placing limits on manufacturers of paint, the legal framework may consider placing an obligation on retailers/exporters to ensure that the paint that they acquire on a wholesale basis complies with the permissible levels of Lead. This will nudge these entities to test samples to ensure compliance and terminate contracts when a manufacturer habitually fails to adhere to the permissible limits. Furthermore, this will foster healthy competition among all stakeholders, ensuring mutual checks and balances.

 **Analysis**

Batteries Waste Management Rules, 2022 place the ultimate responsibility on the producers, known as EPR. However, it also places responsibilities on everyone involved in the supply chain. While regulation through market mechanism is more or less mentioned in primary and secondary legislations mentioned in the table, the below mentioned ones need to mention it even more:

- ▶ While the Environmental Protection Act, 1986 provides for surrogate rules and regulations, there's no regulation through market mechanisms that will shift the burden on different stakeholders in the value chain.
- ▶ The Factories Act, 1948 primarily relies on government inspectors for enforcement rather than self-regulation or market-based mechanisms, holding the value chain accountable.
- ▶ The Food Safety and Standards Act of 2007 and the Regulations of 2011 do not address loose packet food (informal sector) sold in the market without FSSAI approval, even when the market is flooded with them.
- ▶ An association to ensure self-regulation can be formed and SROs (Self-Regulatory Officers) can also support the association in doing so.

DESIGN PRINCIPLE 7

The law should not have a disproportionate impact on the ease of doing business

 **Rationale**

An effective legal framework to tackle Lead poisoning will necessarily involve stringent controls, a robust inspection system, and high penalties which either internalise the social harm caused by the offending conduct or completely deter it. These may require businesses to institute very fundamental changes to their day-to-day operations. As such, regulated entities should be given a timeline to comply with the requirements - e.g. establishing a legal framework but deferring its enforcement by a specified period.

This will enable the regulated entities to prepare by familiarising themselves with the requirements and introducing the necessary changes before the compliance requirements come into force. It is also worth noting that the deferment of enforcement may not be necessary as a blanket measure.

The legal framework may be immediately enforced for certain kinds of paint (e.g. decorative paints used in a house) which have a direct bearing on the health and well-being of children, pregnant women etc. whereas a timeline for compliance may be ideal for industrial paints - for which India has no extant legislation - which will require companies to alter their processes and business practices.

Overall, reducing the possibility of Lead exposure can enhance the ease of doing business for companies. As more and more countries enact stricter regulations on controlling the use of Lead across a variety of sectors, it will become easier for Indian businesses to engage in trade with these countries if they are already in compliance with the limits on Lead set by that country's domestic laws.

Analysis

As seen from the aforementioned Table I, out of the 18 primary and secondary legislations, the following two legislations affect the ease of doing business the most:

- ▶ Regulation of Lead Contents in Household and Decorative Paints Rules, 2016 provides a reasonable timeframe for manufacturers to comply with the new standards, which helps mitigate any immediate negative impact on business operations. However, there may be concerns from smaller manufacturers regarding the costs of reformulating their products.
- ▶ As mentioned above, FSSAI limits Lead content to 10 ppm in Turmeric, however, Compendium Food Additive Regulations bans use of Lead Chromate in Turmeric and Turmeric powder⁴⁰. This may Lead to confusion for the manufacturers of Turmeric.
- ▶ Batteries Waste Management Rules, 2022 by not considering the 90% informal sector, affects the business of the formal sector. The maximum purchase of Lead happens from unlicensed units (backyard smelters) because the secondary Lead from these unauthorised smelters is cheaper⁴¹.

DESIGN PRINCIPLE 8

The law should not encroach on the legislative competence of State Legislatures

Rationale

The regulation of Lead toxicity relates to areas such as public health, environment, working conditions in factories, labour rights etc. - all of which pertain to entries in List II or List III of the Seventh Schedule of the Constitution of India. As the entries in these Lists fall within the exclusive competence of the State Legislatures or within the joint competence of Parliament and State Legislatures (as the case may be), Parliament as well as central agencies/statutory bodies should exercise reasonable caution while legislating to tackle Lead toxicity.

This will not only ensure adherence with a basic constitutional precept - i.e. neither Legislature should encroach, as far as possible, into the other's exclusive domain - but also prevent the possibility of regulatory overlaps. According to our research, we did not find any primary or secondary legislation that is not in alignment with this design principle.

DESIGN PRINCIPLE 9

The law should provide for advocacy of the issue of Lead poisoning

Rationale

The law should mandate robust advocacy mechanisms to address Lead poisoning, ensuring comprehensive public awareness and popularise prevention strategies. For instance, S.49 of The Competition Act, 2007, highlights anti-monopoly advocacy in favour of healthy competition⁴². A similar approach could be implemented for Lead poisoning advocacy. The lack of specific mention of Lead poisoning in the Indian legal framework discussed above is a testament to the fact that there is little or no awareness about Lead poisoning. Thus, an advocacy provision in the law itself will ensure awareness about Lead poisoning.

Analysis

- ▶ None of the aforementioned primary and subordinate legislations include a provision for advocacy.

40. (Compendium Food Additives Regulations, 2020), https://www.fssai.gov.in/upload/uploadfiles/files/Compendium_Food_Additives_Regulations_08_09_2020-compressed.pdf

41. Prajapati, S. (2016). Lead acid battery recycling in India. IOSR J. Electr. Electron. Eng, 11, 2278-1676.

42. (Section 49, The Competition Act, 2002), <https://www.cci.gov.in/images/legalframeworkact/en/the-competition-act-20021652103427.pdf>



International Legal Frameworks

The laws, rules, and regulations listed below have been reviewed. According to our secondary research, these are practical and can potentially serve as models for India in her efforts to prevent Lead poisoning. Additionally, the countries selected have either achieved low levels of Lead poisoning in their population or have distinctive laws that set them apart.



Japan

It's noteworthy that Japan boasts the world's lowest levels of Lead poisoning in children. Surprisingly, the majority of laws do not directly reference Lead, nor is there an Act specifically addressing Lead-free paints⁴³. Yet, it is able to maintain low levels of Lead with the following laws:

The Law Concerning Special Measures for Total Emission Reduction of Nitrogen Oxides from Automobiles in Specified Areas

This law is commonly referred to as the "NOx Law."⁴⁴ This law, enacted in 1970, aimed to reduce air pollution, including Lead emissions, by regulating vehicle emissions. It is interesting to note that Japan was the first country in the world to phase out Leaded petrol⁴⁵.

Industrial Safety and Health Act

This act governs occupational safety and health standards in Japan⁴⁶. It includes regulations related to Lead exposure limits in workplaces where Lead is used or handled. The act sets permissible exposure limits for Lead and mandates employers to implement measures to protect workers from Lead exposure.

Air Pollution Control Act

The act imposes emission standards and pollution control measures on industries and vehicles to minimise Lead emissions and mitigate environmental contamination. This is the only Act that directly mentions Lead.



United Kingdom

The Control of Lead at Work Regulations, 2002

The comprehensive legislation is specifically designed to protect workers from the health hazards associated with exposure to Lead⁴⁷. It includes industries such as manufacturing, construction, and demolition where Lead-based materials or processes are used.

The Water Supply (Water Quality) Regulations, 2016

These regulations set standards for the quality of water supplied by water companies in England and Wales⁴⁸. They include limits on the concentration of Lead in drinking water, ensuring it remains below levels that could pose a risk to public health. A unique provision in this law states that if a supplier gets a notice from a property owner who wants to replace their part of a water pipe and asks the supplier to replace the rest because they suspect there's too much Lead in the water, the supplier has to do it. This rule applies to pipes mainly made of Lead that get water pressure from a main supply and are partly owned by the supplier and partly by the property owner.

Housing Health and Safety Rating System (HHSRS), 2006

The primary goal of the HHSRS is to ensure that residential properties meet minimum health and safety standards⁴⁹, thereby protecting the health and well-being of occupants. The HHSRS applies to all residential properties. The system operates by conducting a comprehensive risk assessment of a property to identify potential hazards that could affect the health and safety of occupants. This Act recognises Lead as one of the hazards and mentions that exposure to Lead poses significant health risks.

43. IPEN, Global Lead Paint Elimination Report, 2020, <https://ipen.org/documents/global-lead-paint-elimination-report-2020>

44. (The Law Concerning Special Measures for Total Emission Reduction of Nitrogen Oxides from Automobiles in Specified Areas, 1970)

45. (Ritchie, 2022)

46. (Industrial Safety and Health Act, 1972.)

47. (The Control of Lead at Work Regulations, 2002)

48. (The Water Supply (Water Quality) Regulations, 2016)

49. (Housing Health and Safety Rating System, 2006)



South Africa

The Mine Health and Safety Act (MHSA) 29 of 1996

This legislation is designed to ensure the health and safety of workers in the mining industry⁵⁰. It encompasses regulations, guidelines and procedures aimed at preventing accidents, injuries, and occupational health hazards in mines. The MHSA typically addresses various aspects of workplace safety, including ventilation, equipment standards, emergency preparedness, training requirements, and health monitoring. This Act mentions the permissible limits of Lead in potable water as 100 ug/l, which are much higher than the permissible limits.

Lead Regulations, 2001

These primarily focus on controlling and managing Lead exposure to safeguard human health and the environment⁵¹. These regulations are applicable to each employer and individual who is self-employed in a setting where Lead is manufactured, processed, utilised, managed, or stored in a manner that allows for inhalation, ingestion, or absorption by anyone present in that environment. The regulations state that employers or self-employed individuals are prohibited from mandating or allowing anyone to work in an environment where they would face Lead exposure surpassing the permissible occupational exposure thresholds.

Additionally, the regulations outline responsibilities for industry, government and individuals in preventing Lead contamination and enforcing compliance with the set standards. It also imposes a duty on the employee to obey the instructions of the employer when exposed to Lead poisoning.

These regulations also focus on Lead waste management including recycling and disposal. It has been stated that an employer or a self-employed individual is required, to the extent reasonably practicable, to manage Lead waste effectively in the workplace. This entails recycling all Lead waste, ensuring it does not enter non-Lead production processes and storing it in containers that prevent exposure during handling. The highlight of the Act are its annexures that mention the maximum intervals between blood Lead measurements (which start as low as 0.00002 ug/l), removal levels and levels required to return for work.



USA

Clean Air Act (CAA), 1963

This Act is a landmark piece of legislation in the United States aimed at addressing air pollution⁵². Lead in the air is governed by the CAA through two distinct avenues:

- ▶ It is included among the six common pollutants subject to national ambient air quality standards (NAAQS) set by the Environmental Protection Agency (EPA).
- ▶ It is categorised as a toxic air pollutant (alternatively termed hazardous air pollutant), thereby subjecting emissions from industrial facilities to regulation.

Clean Water Act (CWA), 1972

This is a comprehensive law aimed at regulating and improving the quality of the nation's waterways⁵³. It establishes guidelines for controlling pollution discharges into surface waters and sets standards for wastewater treatment by industries and municipalities. The act also includes provisions for protecting wetlands and maintaining water quality standards, with the Environmental Protection Agency (EPA) overseeing its enforcement and implementation in collaboration with state agencies.

The CWA prohibits the discharge of pollutants, including Lead, into U.S. waters from a point source without a National Pollutant Discharge Elimination System (NPDES) permit. These permits outline discharge limits, monitoring, reporting requirements and other provisions to safeguard water quality and public health.

50. (The Mine Health and Safety Act (MHSA) 29, 1996)

51. (Lead Regulations, 2001)

52. (Clean Air Act, 1963)

53. (Clean Water Act, 1972)

Safe Drinking Water Act (SDWA), 1974

The Safe Drinking Water Act (SDWA) was instituted to safeguard the quality of drinking water across the United States,⁵⁴ focusing on both surface and underground water sources designated or potentially intended for drinking purposes.

Under this Act, in 1991, the EPA introduced a regulation aimed at managing Lead and copper levels in drinking water, commonly referred to as the Lead and Copper Rule (LCR). Under the treatment technique outlined in the rule, water systems are required to monitor drinking water quality at customer taps. If Lead concentrations surpass an action level of 15 ppb or copper concentrations exceed an action level of 1.3 ppm in more than 10% of customer taps sampled, the system must implement additional measures to control corrosion.

Toxic Substances Control Act (TSCA), 1976

There are certain provisions that directly address the issue of Lead exposure such as, to mitigate the risk of Lead exposure during renovation and remodelling of target housing, public buildings built before 1978, and commercial buildings. The Administrator must, within 18 months of this section's enactment, establish guidelines for conducting such activities that may pose a risk of exposure to hazardous levels of Lead. These guidelines must be distributed to individuals involved in renovation and remodelling through hardware and paint stores, employee organisations, trade associations, state and local agencies, and other suitable channels. Additionally, these renovations must be conducted by a Lead-certified expert, with certification issued by the Environmental Protection Agency (EPA).

Comprehensive Environmental Response, Compensation, and Liability Act, 1980 (CERCLA)

This legislation established a levy on the chemical and petroleum sectors, granting expansive Federal power to directly address instances or potential occurrences of hazardous substance releases endangering public health or the environment⁵⁵. Over a span of five years, \$1.6 billion was amassed through this tax, allocated to a fund designated for the cleanup of abandoned or unregulated hazardous waste sites. The statute permits two types of response measures:

- ▶ Immediate interventions, allowing for swift actions to mitigate releases or potential releases necessitating urgent attention.
- ▶ Persistent remedial responses aimed at permanently and substantially mitigating the risks posed by serious hazardous substance releases or threats thereof, though not immediately life-threatening. These interventions are exclusively carried out at sites identified on the EPA's National Priorities List.

Residential Lead-Based Paint Hazard Reduction Act, 1992

This is the law that directly talks about the measures that can be taken to abate the after-effects by using the Lead-based paints⁵⁶. This Act requires disclosure by the sellers and lessors of residential properties built before 1978 about any known Lead-based paint hazards to buyers or tenants. Moreover, buyers and tenants must receive information pamphlets about Lead-based paint hazards before signing contracts or leases for pre-1978 residential properties. Further, contractors performing renovation, repair, or painting work on pre-1978 residential properties must be certified and follow specific Lead-safe work practices to minimise Lead exposure.

Occupational Safety and Health Administration (OSHA)

OSHA is a part of the United States Department of Labour. OSHA's mission is to ensure safe and healthy working conditions for America's workers, free from unlawful retaliation. To achieve this, OSHA has taken many steps. Amongst this, setting of sets and standards is one.

54. (Safe Drinking Water Act, 1974)

55. (Comprehensive Environmental Response, Compensation and Liability Act, 1980)

56. (Residential Lead-Based Paint Hazard Reduction Act, 1992)

It states the following about Lead:

- ▶ Employee exposure to airborne Lead concentrations of 30 µg/m³ averaged over an 8-hour period must be assessed without considering the use of respirators.
- ▶ Employers must ensure that no employee is exposed to Lead concentrations exceeding 50 µg/m³ averaged over an 8-hour period.

It also goes on to explain the measures in case of exposure⁵⁷.



Australia

Occupational Health and Safety Regulations, 2017

These regulations feature a dedicated section addressing Lead-related matters. It begins by defining the concept of Lead processing, outlining its involvement in business operations.⁵⁸ Subsequently, it covers medical examinations and biological monitoring aimed at identifying changes in an individual's health resulting from occupational exposure to Lead. Additionally, the regulations detail the responsibilities of employers, risk management concerning Lead processing, the periodic review of control measures, cleaning protocols, facilities for changing and washing, disposal procedures for protective equipment, and health monitoring before and after Lead-related activities. Of utmost importance, these regulations specify permissible limits for Lead exposure.



European Union's Regulations and Directives

REACH Regulation (Registration, Evaluation, Authorisation and Restriction of Chemicals)

REACH is a comprehensive regulation that covers the registration, evaluation, authorization, and restriction of chemicals.⁵⁹ Under REACH, certain hazardous substances, including Lead compounds, are subject to restrictions or authorization for their use in products, including paints and coatings.

Directive 2008/98/EC (the Waste Framework Directive)

This directive establishes a legal framework for the management of waste, including hazardous waste such as Lead-containing paints.⁶⁰ It sets out requirements for waste prevention, recycling, and disposal, which can indirectly impact the use and handling of Lead-based paints.

Directive 2009/48/EC (Toy Safety Directive)

This directive aims to ensure the safety of toys distributed within the EU market. The directive outlines requirements related to various aspects of toy safety, including chemical composition, physical properties and potential hazards such as choking or suffocation risks. Lead permissible limits are also mentioned. Manufacturers, importers and distributors are obligated to comply with these standards, ensuring that only toys meeting the specified safety criteria are made available to consumers. Additionally, the directive includes provisions for marking, labelling and documentation to facilitate traceability and enforcement of safety measures.

Directive 2011/65/EU (RoHS Directive)

The primary objective of this regulation is to restrict the use of certain hazardous substances in electrical and electronic equipment (EEE) to safeguard human health and the environment. Specifically, the directive aims to limit the presence of Lead and other hazardous substances in EEE. It establishes strict concentration limits for these hazardous substances in EEE, ensuring that products placed on the EU market comply with these restrictions

57. (Occupational Safety and Health Administration Standard, 1970)

58. (Occupational Health and Safety Regulations, 2017)

59. (Regulation (EC) No 1907/2006 of the European Parliament and of The Council, European Union)

60. (Directive 2008/98/EC Of The European Parliament And Of The Council, European Union)

Directive 2020/2184/EU (Drinking Water Directive)

This directive establishes regulations aimed at safeguarding human health by ensuring that water intended for human consumption remains pure and untainted. It also seeks to enhance access to such water for all individuals within the Union. Exemptions from this directive include natural mineral waters recognized as such by the responsible authority and waters classified as medicinal products. Concerning Lead, the WHO suggested maintaining the current parameter value while emphasising that concentrations should be minimised to the greatest extent feasible. Hence, it is proposed to uphold the current value of 10 ug/l for a duration of 15 years following the implementation of this Directive. By the conclusion of this transition period, the parameter value for Lead should not exceed 5 ug/l. Nevertheless, for all novel materials intended for contact with water meant for human consumption, regardless of their application in supply or domestic distribution networks, adherence to the 5 ug/l standard should be mandatory at the point of use.

Conclusion

In India, the use of Leaded petrol was banned starting from April 1, 2000, under the “Gasoline (Leaded Petrol) Amendment Order, 1998” issued by the Ministry of Petroleum and Natural Gas. Since then, all petrol sold in India has been unLeaded. This was the first big measure by the Government of India towards mitigation of Lead toxicity. Despite efforts through primary and subordinate legislation mentioned in Chapter II, these measures have had limited impact. In summation, it can be said that India’s legal framework addressing Lead poisoning is operating in silos, necessitating greater cohesion. While enhancing robustness is crucial, raising awareness about Lead exposure and fostering inter-ministerial coordination are paramount.

The Design Principles in the present study have been prepared by keeping in mind the urgency to mitigate Lead poisoning. These principles provide a framework for a robust law focused on preventing and mitigating Lead poisoning. The analysis following each principle identifies which Act, law, regulation, or rule that is not in sync with the principle, thereby assisting the government in understanding how to strengthen laws to combat Lead poisoning. Moreover, by implementing the below-mentioned recommendations, India can develop a comprehensive and effective strategy to combat Lead poisoning, safeguarding public health and ensuring a safer environment for all.

It is important to factor-in for Indian policymakers the overview of international frameworks that have successfully maintained lower blood Lead levels (BLLs) in various countries. While these frameworks cannot be directly applied to the Indian context, they offer valuable insights and inspiration. They can guide efforts to strengthen India’s legal framework regarding Lead poisoning and assist various government agencies in raising awareness and addressing the issue of Lead poisoning effectively.

The recommendations derived from our extensive secondary research aim to contribute critical inputs to policymaking in the sphere of Lead toxicity. The recommendations range from potentially transformative measures to more modest suggestions that address finer details. Nonetheless, each recommendation holds significance from our perspective.

Lastly, considering the significant impact of Lead toxicity from diverse sources on children, we believe addressing Lead poisoning should be among the government’s top public health priorities to ensure a healthier future for the nation.

Recommendations

Based on the established design principles, the assessment of the Indian legal framework, and the examination of international legal frameworks, the following recommendations are proposed:

- ▶ A separate set of Rules can be prepared under the Environment Protection Act, 1986 pertaining to Lead poisoning. These rules may be based on the framework mentioned in this report, thereby making it inclusive and robust. Inspiration can also be drawn from the Lead regulations, 2001 of South Africa.
- ▶ As mentioned in the introduction, Lead poisoning poses significant health risks, especially to children, causing developmental issues, neurological damage, and other serious health problems. Currently, the existing legal framework does not comprehensively cover all aspects of Lead contamination and its mitigation. The fact that there is no established safe blood Lead level (BLL) highlights the urgency to have a dedicated set of Rules, better protection of public health can be ensured, stricter enforcement of Lead-related standards, and increased accountability among industries and stakeholders.
- ▶ It is suggested to establish clear working standards for workers with occupational exposure to Lead, similar to America's OSHA and the UK's The Control of Lead at Work Regulations, 2002.
- ▶ It is suggested to remove Lead Arsenate from the category of insecticides and the Insecticides Act, 1986 can then be amended accordingly. As mentioned earlier, Lead Arsenate falls under "List of Pesticides Which Are Banned, Refused Registration And Restricted in Use, 2019", however, the Insecticides Act, 1986 still lists it as an insecticide. Thus, it is important to remove Lead Arsenate from the category of permissible insecticides.
- ▶ A provision to incentivise informal recyclers to formalise their operations can be included in The Batteries Waste Management Rules, 2022.
- ▶ The issue of non-compliance regarding Lead pipes must be addressed with some penalties under Code of Practice for Water Supply in Buildings, 1957 and Lead Stabiliser in Polyvinyl Chloride (PVC) Pipes and Fittings Rules, 2021. Additionally, clear guidelines should be established regarding the responsibility for replacing Lead pipes upon the request of consumers.
- ▶ The FSSAI should include provisions to bring products manufactured in the informal sector under its mandate and ensure safer products reach consumers.
- ▶ The Compendium Food Additives Regulations, 2020 bans use of Lead Chromate in Turmeric, however, FSSAI limits Lead content to 10 ppm in Turmeric, which seems like a conflict/ loophole which could be taken advantage of.
- ▶ The Lead Contents in Household and Decorative Paints Rules, 2016, prohibit paints containing Lead above 90 ppm but do not address houses already painted with Lead or procedures for renovation.
- ▶ India could consider adopting Rules under the Environment Protection Act, 1986, similar to that of the EU's Toy Safety Directive (2009/98/EC) to prioritise children's safety and ensure responsible toy manufacturing.
- ▶ Regulatory impact assessments are crucial, and each ministry and government wing involved should implement a robust assessment process.
- ▶ Those trade practices and market mechanisms should be promoted that regularise, mitigate, and prevent Lead poisoning.

Resources

Articles

- ▶ Prajapati, S. (2016). Lead acid battery recycling in India. IOSR J. Electr. Electron. Eng, 11, 2278-1676.
- ▶ Taran Deol, (2023, Jan 12), Element of mystery: Lead poisoning is a huge public health concern for India; here's why, 2023.
- ▶ Alam, M.F., Akhter, M., Mazumder, B. et al. (2019) Assessment of some heavy metals in selected cosmetics commonly used in Bangladesh and human health risk. J Anal Sci Technol 10, 2 (2019).

Reports

- ▶ Toxics Link, Loaded Leaded Batteries Mapping the Toxic Waste Trail, 2019
- ▶ CSIR-NITI Aayog - Assessment of Lead Impact On Human And India's Response, 2022
- ▶ Toxics Link, Lead Chromate, Nov 2023

Laws, Codes, Rules, Regulations, Directives

- ▶ Air Pollution Control Act
- ▶ Batteries Waste Management Rules, 2022
- ▶ Clean Air Act (CAA), 1963
- ▶ Clean Water Act (CWA), 1972
- ▶ Comprehensive Environmental Response, Compensation, and Liability Act, 1980 (CERCLA)
- ▶ Directive 2008/98/EC (the Waste Framework Directive)
- ▶ Directive 2009/48/EC (Toy Safety Directive)
- ▶ Directive 2011/65/EU (RoHS Directive)
- ▶ Directive 2020/2184/EU (Drinking Water Directive)
- ▶ FDA Food Code, 2022
- ▶ Housing Health and Safety Rating System (HHSRS), 2006
- ▶ Industrial Safety and Health Act
- ▶ Lead Regulations, 2001
- ▶ Lead Stabiliser in Polyvinyl Chloride (PVC) Pipes and Fittings Rules, 2021
- ▶ Occupational Health and Safety Regulations, 2017
- ▶ Occupational Safety and Health Administration Standards, 1970 (OSHA)
- ▶ REACH Regulation (Registration, Evaluation, Authorisation and Restriction of Chemicals)
- ▶ Residential Lead-Based Paint Hazard Reduction Act, 1992
- ▶ Safe Drinking Water Act (SDWA), 1974
- ▶ The Child Labour Act, 1986, Amendment Rules, 2016 and Amendment Rules, 2017
- ▶ The Code of Practice for Water Supply in Buildings, 1957
- ▶ The Competition Act, 2002
- ▶ The Consumer Protection Act and Rules, 1986 and Rules 2019
- ▶ The Control of Lead at Work Regulations, 2002
- ▶ The Drugs and Cosmetics Act, 1940 and Cosmetics Rules, 2020
- ▶ The Environment Protection Act and The Environment Protection Rules, 1986
- ▶ The Factories Act, 1948
- ▶ The Food Safety and Standards Act, 2007 and Regulations, 2011
- ▶ The Hazardous Waste Management Rules, 2016

- ▶ The Insecticides Act, 1986
- ▶ The Law Concerning Special Measures for Total Emission Reduction of Nitrogen Oxides from Automobiles in Specified Areas
- ▶ The Mine Health and Safety Act (MHSA) 29 of 1996
- ▶ The Water Supply (Water Quality) Regulations, 2016
- ▶ Toxic Substances Control Act (TSCA), 1976



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