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# **PROTECTING CHILD HEALTH FROM LEAD EXPOSURE AND TOXICITY IN NEPAL: POLICY RESPONSE AND FUTURE DIRECTIONS**

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**POSITION PAPER-V**



**NEPAL PAEDIATRIC SOCIETY-2026**

Position Paper on **Protecting Child Health from Lead Exposure and Toxicity in Nepal: Policy Response and Future Directions.**  
Endorsed by Nepal Paediatric Society (NEPAS)

Maj. Gen. Dr. Arun Kumar Neopane (Retd.)  
President (2025-27)  
Nepal Paediatric Society

Prof Dr. Ramesh Adhikari  
Past President & Senior Advisor to the Executive  
Committee  
Nepal Paediatric Society

Dr. Ram Hari Chapagain  
Senior Paediatrician & Vice President,

Dr. Kulesh Thapa,  
Senior Advisor to the Executive Committee  
Nepal Paediatric Society

Dr. Prakash Joshi  
Senior Paediatrician & General Secretary,

Prof. Dr. Laxman Shrestha  
Past President & Senior Advisor to the Executive  
Committee  
Nepal Paediatric Society

Dr. Keyoor Gautam  
MD Pathology  
Samyak Diagnostic Pvt Ltd.

Dr. Krishna Prasad Bista.  
Senior Advisor to the Executive Committee  
Nepal Paediatric Society

Prof Dr. Ram Padarath Bichha  
Senior Advisor to the Executive Committee

Dr. Meghnath Dhimal (PhD)  
Environmental Health Scientist  
Nepal Health Research Council (NHRC)

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Address: Nepal Paediatric Society GPO Box; 2688 Lamatengin Marg, Baluwatar, Kathmandu, Nepal. E-Mail: [nepas2010@gmail.com](mailto:nepas2010@gmail.com), [office@nepas.org.np](mailto:office@nepas.org.np)

## **Position Paper on Protecting Child Health from Lead Exposure and Toxicity in Nepal: Policy Response and Future Directions.**

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### **Executive Summary**

Lead exposure remains one of the most preventable yet neglected environmental threats to child health globally. In Nepal, emerging evidence suggests that a substantial proportion of children are exposed to unsafe levels of lead through household paints, contaminated dust and soil, informal battery recycling, food adulteration, industrial emissions, and unsafe consumer products. As there is **no safe level of lead exposure in children**, even low levels may impair brain development, reduce intelligence, affect behaviour, and diminish lifelong educational and economic potential.

The Nepal Paediatric Society (NEPAS) recognizes lead toxicity as a major child rights, public health, developmental, and environmental justice issue. Children are uniquely vulnerable because they absorb more lead than adults and because their developing brains and nervous systems are highly sensitive to toxic injury. In many cases, exposure is silent and goes unrecognized until damage has already occurred.

Nepal has taken important steps, particularly through the **Lead Paint Standard (90 ppm) for import in the country**. However, broader prevention, surveillance, enforcement, clinical preparedness, and public awareness remain insufficient. This Position Paper calls for a coordinated national response involving households, communities, health professionals, educators, industries, municipalities, regulators, researchers, media, civil society, and all levels of government.

NEPAS recommends immediate actions including strengthened enforcement of lead regulations, national blood lead surveillance, screening of high-risk children, safer waste and battery recycling systems, food safety monitoring, healthcare worker training, parental awareness, school-based prevention, and development of a National Lead Poisoning Prevention and Control Strategy.

## 1. Introduction

Lead is a naturally occurring metal that has historically been used in paints, batteries, pigments, pipes, cosmetics, and various industrial products. Despite known toxicity, lead continues to be present in environments where children live, play, eat, and learn. In low- and middle-income countries, lead exposure often arises through informal economies, weak regulation, rapid urbanization, and poor waste management.

In Nepal, child environmental health has not traditionally focused on heavy metal exposure. Yet available studies and global estimates indicate that lead exposure may be widespread. This Position Paper has been developed by the Nepal Paediatric Society (NEPAS) to provide evidence-based guidance, advocate for child-centred policy, and outline guidelines and practical actions for all stakeholders.

## 3. Why Lead Matters in Children

Lead is particularly dangerous for foetuses, infants, and children. Once absorbed, it can affect multiple organs, especially the brain, nervous system, kidneys, blood, and bones. Even low-level chronic exposure may result in reduced Intelligence Quotient (IQ), poor attention span, language delay, learning difficulties, behavioural problems, and reduced school achievement. Higher levels can cause anaemia, abdominal pain, hearing impairment, poor growth, seizures, coma, and death. Lead stored in bones can persist for years and may be mobilized during pregnancy, exposing the foetus. Because many affected children show no obvious symptoms, lead poisoning is often missed.

The scientific consensus is clear: **there is no safe blood lead level in children.**

## 4. Current Situation in Nepal

Available evidence from Nepal and international estimates suggests a concerning burden of childhood lead exposure. Studies in Kathmandu Valley and urban settings have reported a high proportion of children with elevated blood lead levels. Informal observations and environmental reports also indicate risks related to paints, battery recycling, urban dust, contaminated spices, and poorly regulated industrial practices. The true national burden is likely underestimated because Nepal does not yet have routine nationwide blood lead surveillance, standardized reporting systems, or widespread diagnostic capacity. Rural areas may also face under-recognized exposure from imported products, e-waste, contaminated cookware, and cottage industries.

## **5. Major Sources of Lead Exposure in Nepal**

Lead exposure in Nepal likely occurs through multiple pathways. Lead-based paints remain a major concern, especially in older homes, schools, rental properties, toys, furniture, and repainting dust. Informal recycling of lead-acid batteries exposes workers, nearby families, and communities through fumes, dust, and contaminated soil.

Contaminated spices and food adulteration, especially the use of lead chromate in turmeric or pigments in food products, represent another important route. Urban dust, roadside soil, industrial emissions, metal workshops, ceramics, low-quality cosmetics, traditional remedies, and unsafe cookware may also contribute.

## **6. South Asian evidence on lead in turmeric**

South Asian evidence identifies turmeric as a critical source of lead exposure relevant to Nepal. A 2024 study by Forsyth et al. in *Science of the Total Environment* found 14% of 356 turmeric samples across the region contained elevated lead, with some exceeding 1000 µg/g and chemical ratios indicating deliberate adulteration with lead chromate. Studies from Bangladesh confirm this practice, linking such contamination directly to increased blood lead levels. Given Nepal's frequent daily use of turmeric and informal supply chains, even small exposures can lead to chronic toxicity in children and pregnant women, causing neurodevelopmental harm, reduced IQ, and long-term loss of human potential; turmeric contamination should therefore be treated as a major public health priority. Children in crowded settlements, near traffic corridors, near workshops, or in low-income communities often face cumulative exposures.

## **7. Vulnerable Groups**

Children under five years of age are at highest risk because of frequent hand-to-mouth behaviour, crawling on floors, and rapid brain development. Pregnant women are vulnerable because maternal exposure can harm the foetus. Children with iron deficiency, calcium deficiency, undernutrition, pica, or developmental disabilities may absorb more lead or experience greater consequences. Children of workers employed in battery, metal, paint, repair, recycling, or industrial sectors may be exposed through “take-home contamination” on clothing, shoes, tools, or skin.

## **8. Health, Educational and Economic Consequences**

Lead exposure is not only a medical issue; it is a national development issue. Reduced cognitive capacity lowers school performance and future productivity. Behavioural impacts may affect classroom learning and social outcomes. Families may face healthcare costs and lost income. At population level, widespread low-level lead exposure can reduce national

human capital and economic growth. For Nepal, investing in lead prevention is therefore both a health intervention and an economic strategy.

## **9. Existing Legal and Policy Context in Nepal**

Nepal's most specific legal measure is the **Lead Paint Standard**, which limits lead in paints to 90 ppm. This is an important achievement and should be commended. Broader environmental and public health protections are also present through the Environment Protection Act 2019, Public Health Service Act 2019, Food Act 1966 and Food Hygiene and Quality Act 2023, Labour Act 2017 and Solid Waste Management Act 2011, Consumer Protection Act 2017, Local Government Protection Act 2017. However, implementation remains fragmented. There is no dedicated national lead poisoning prevention program, no routine blood lead screening policy, no integrated child environmental surveillance system, and limited enforcement capacity across sectors.

## **10. Position of Nepal Paediatric Society**

The Nepal Paediatric Society (NEPAS) declares that lead exposure in children is unacceptable, preventable, and inconsistent with the right of every child to healthy growth and development. Preventing lead exposure must be prioritized over treatment because much of the neurological damage is irreversible. NEPAS supports a national, evidence-based, equity-focused, multi-sectoral response that places children at the centre of environmental policy.

## **11. Recommendations for Households & Common Public**

- i. Use only certified, lead-safe paints, toys, utensils, spices, and cosmetics from trusted sources.
- ii. Maintain household cleanliness through wet mopping and damp dusting rather than dry sweeping.
- iii. Ensure regular handwashing for children, especially before meals and after outdoor play.
- iv. Prevent children from playing near workshops, battery scrap areas, roadside dust, or contaminated soil.
- v. Provide balanced diets rich in iron, calcium, vitamin C, and protein to reduce lead absorption.
- vi. Seek medical evaluation for developmental delay, unexplained anaemia, behavioural changes, pica, or suspected exposure.

- vii. Report unsafe recycling, hazardous dumping, or suspected food adulteration to local authorities.

## **12. Recommendations for Schools and Educational Institutions**

- i. Inspect school buildings, furniture, toys, and painted surfaces for safety hazards.
- ii. Ensure child-safe renovation and maintenance practices that minimize paint dust exposure.
- iii. Strengthen handwashing, hygiene, and environmental cleanliness measures.
- iv. Include environmental health and toxic exposure awareness in school health education.
- v. Refer children with learning or behavioural concerns for medical assessment and counselling when appropriate.

## **13. Recommendations for Healthcare Professionals and Health Institutions**

- i. Maintain suspicion for lead exposure in high-risk children and communities.
- ii. Include environmental exposure history in paediatric assessments.
- iii. Screen and evaluate children with developmental delay, anaemia, abdominal pain, behavioural concerns, or pica suspecting lead contamination.
- iv. Advocate for access to blood lead testing and referral pathways.
- v. Integrate developmental surveillance and counselling into routine childcare.
- vi. Strengthening training in environmental paediatrics and toxicology.

## **14. Recommendations for Industry and Private Sector**

- i. Ensure full compliance with the national lead paint standard and all safety laws.
- ii. Eliminate lead from paints, toys, cookware, and consumer products.
- iii. Adopt safe, formal battery recycling systems with worker protection measures.
- iv. Prevent industrial emissions and environmental contamination.
- v. Ensure food supply chains are free from adulteration and toxic contaminants.
- vi. Conduct regular independent compliance audits and public reporting.

## **15. Recommendations for Local Governments**

- i. Identify and regulate informal battery recycling, scrap yards, and hazardous workshops in their respective municipalities.
- ii. Improve waste collection, hazardous waste disposal, and environmental sanitation.

- iii. Conduct inspections of schools, childcare centres, markets, and industrial areas.
- iv. Run local awareness campaigns on lead contamination and prevention through wards, schools, FM radio, social media and community groups.
- v. Integrate child environmental safety into urban planning and licensing systems.
- vi. Conduct random testing of turmeric and other high-risk spices for lead in local markets and remove contaminated products.

## **16. Recommendations for Provincial and Federal Government**

- i. Develop a National Lead Poisoning Prevention and Control Policy, Strategy and Guidelines.
- ii. Strengthen enforcement of the 90 ppm lead paint standard.
- iii. Establish blood lead surveillance and phased screening in high-risk areas.
- iv. Expand laboratory capacity for blood and environmental lead testing.
- v. Develop national clinical guidelines for screening, diagnosis, treatment, & follow-up.
- vi. Strengthen food safety monitoring for heavy metals, with focus on turmeric and spice supply chains.
- vii. Enforce strict prohibition of lead adulterants (e.g., lead chromate) and enable testing at borders and markets.
- viii. Formalize or prohibit unsafe informal battery recycling practices.
- ix. Prevent import and sale of unsafe lead-containing products.
- x. Allocate dedicated budget lines for prevention, monitoring, and remediation.
- xi. Establish inter-ministerial coordination with clear accountability.

## **17. Recommendations for Researchers, Universities, and Academia**

- i. Conduct national prevalence studies on childhood lead exposure.
- ii. Map environmental hotspots and identify exposure sources.
- iii. Study long-term developmental and economic impacts of lead exposure in Nepal.
- iv. Evaluate cost-effective prevention and screening models.
- v. Support evidence generation for policy and regulation.

## **18. Recommendations for Media and Civil Society**

- i. Raising public awareness on lead contamination, exposure and prevention measures.

- ii. Promote evidence-based reporting.
- iii. Monitor accountability of industries and regulators.
- iv. Support community reporting of unsafe practices.
- v. Advocate for child environmental rights and safer communities.

## **19. Priority Actions for the Next Three Years**

Nepal should immediately strengthen enforcement of the lead paint standard, initiate blood lead testing in selected high-risk urban districts, map informal battery recycling hotspots, launch national awareness campaigns, and create inter-ministerial coordination mechanisms. These early steps would create momentum toward a comprehensive long-term program.

## **20. Conclusion**

Lead exposure is a silent but preventable threat to Nepal's children and to the nation's future. No child should lose intelligence, health, or opportunity because of avoidable toxic exposure. Emerging South Asian evidence also identifies turmeric and other commonly consumed spices as potential sources of lead exposure through adulteration, making food safety surveillance essential. Nepal has the policy foundations to act, but implementation must now match the scale of the problem. The Nepal Paediatric Society (NEPAS) calls upon citizens, professionals, industries, civil society, and all levels of government to work together urgently to eliminate preventable lead exposure and protect every child's right to thrive.

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