

Lead in Solvent-Based Paints for Home Use in India *(Summary)*

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Toxics Link is an Indian environmental research and advocacy organization set up in 1996, engaged in disseminating information to help strengthen the campaign against toxics pollution, and to provide cleaner alternatives. Toxics Link work with other groups around the country as well as internationally in an understanding that this will help bring the experience of the ground to the fore, and lead to a more meaningful articulation of issues. Toxics Link engages in the emerging issues of highly hazardous pesticides (HHPs), Persistent Organic Pollutants (POPs), hazardous heavy metal contamination, pharmaceutical pollutants, etc. from the environment and public health point of view. Toxics Link also work on the ground in areas of municipal, hazardous, and medical waste management, and food safety among others. Toxics Link has successfully implemented various best practices and has brought in policy changes in the aforementioned areas apart from creating awareness among several stakeholder groups.

IPEN established in 1998 is currently comprised of over 600 Participating Organizations in over 125 countries, primarily developing and transition countries. IPEN brings together leading environmental and public health groups around the world to establish and implement safe chemicals policies and practices that protect human health and the environment. IPEN's mission is a toxics-free future for all.

IPEN is an international NGO network of health and environmental organizations from all regions of the world of which the Toxics Link is a member. IPEN helps build the capacity of its member organizations to implement on-the-ground activities, learn from each other's work, and work at the international level to set priorities and achieve new policies.



Preface and Acknowledgements

In 2007, Toxics Link initiated a study on lead in paint and found very high lead content among sampled paints sold in the Indian market. Later in 2008, NGOs in the IPEN network along with Toxics Link, an IPEN Participating Organization from India and the regional hub for IPEN South Asia, collected and analyzed decorative (home use) paints on the market in 11 developing countries, and in countries with economies in transition. In each of these countries, many of the paints contained exceedingly high lead levels. Subsequently the issue was accepted as an emerging policy subject in Strategic Approach to Chemical Management (SAICM) and the Global Alliance to Eliminate Lead Paint (GAELP) was mooted jointly by the World Health Organization (WHO) and the United Nations Environment Programme (UNEP) to focus and catalyze the efforts to achieve international goals to prevent children's exposure to paints containing lead and to minimize occupational exposures to lead paint. Since then, IPEN-affiliated NGOs and others have sampled and analyzed paints on the market in more than 50 low- and middle-income countries.

These and other studies suggest that lead paints, especially paints intended for decorative (home) use, continue to be widely produced, sold, and used in developing countries even though most highly industrial countries banned lead paints for household use more than 40 years ago.

This compliance monitoring report presents new data on the total lead content of solvent-based paints for home use available on the market in India. It also presents background information on why the use of lead paint is a source of serious concern, especially to children's health; a review of national policy frameworks that are in place to ban or restrict the manufacture, import, export, sale, and use of lead paint, and provides a strong justification to strengthen compliance monitoring and enforcement of lead paint regulatory controls in India. Finally, it proposes action steps by different stakeholders to protect children and others from lead paint.

We take this opportunity to thank all those who were instrumental in compiling and shaping this paint study.

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While this study was undertaken with funding assistance from the New York Community Trust (NYCT) and the Swedish Government, responsibility for the content lies entirely with IPEN and Toxics Link. The NYCT and the Swedish Government do not necessarily share the expressed views and interpretations.



Background

Lead is a toxic metal that causes adverse effects on both human health and the environment. While lead exposure is also harmful to adults, lead exposure harms children at much lower levels, and the health effects are generally irreversible and can have a lifelong impact.

The younger the child, the more harmful lead can be, and children with nutritional deficiencies absorb ingested lead at an increased rate. The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child.¹ Lead is also transferred through breast milk when lead is present in a nursing mother.²

Evidence of reduced intelligence caused by childhood exposure to lead has led the World Health Organization (WHO) to list “lead-caused mental retardation” as a recognized disease. WHO also lists it as one of the top ten diseases whose health burden among children is due to modifiable environmental factors.

Lead paint is a major source of childhood lead exposure. The term lead paint is used in this report to describe any paint to which one or more lead compounds have been added. The cut-off concentration for lead paint used in the report is 90 parts per million (ppm, dry weight of paint), the strictest legal limit enacted in the world today. All lead concentrations in the report are total lead levels, unless otherwise specified.

A study investigating the economic impact of childhood lead exposure on national economies in all low- and middle-income countries estimated a total cumulative cost burden of \$977 billion international dollars³ per year.⁴

Most highly industrial countries adopted laws or regulations to control the lead content of decorative paints—the paints used on the interiors and exteriors of homes, schools, and other

¹ Bellinger, D.C., Very low lead exposures and children's neurodevelopment. *Current Opinion in Pediatrics*, 2008. 20(2): p. 172-177.

² Bjorklund, K.L., et al., Metals and trace element concentrations in breast milk of first time healthy mothers: a biological monitoring study. *Environmental Health*, 2012. 11.

³ An international dollar is a currency unit used by economists and international organizations to compare the values of different currencies. It adjusts the value of the U.S. dollar to reflect currency exchange rates, purchasing power parity (PPP), and average commodity prices within each country. According to the World Bank, “An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States.” The international dollar values in this report were calculated from a World Bank table that lists GDP per capita by country based on purchasing power parity and expressed in international dollars.

⁴ Attina, T.M. and L. Trasande, Economic Costs of Childhood Lead Exposure in Low- and Middle-Income Countries. *Environmental Health Perspectives*, 2013. 121(9): p. 1097-1102.



child-occupied facilities—beginning in the 1970s and 1980s. In India, a “*Regulation of Lead Contents in Household and Decorative Paints Rules, 2016*” was adopted on the 1st of November 2016 and entered into force one year after, on the 1st of November 2017. This regulation prohibits the manufacture, trade, import, and export of household and decorative paints containing lead or lead compounds in excess of 90 ppm.

From February to May 2023, Toxics Link purchased a total of 51 cans of paints—46 enamel decorative paints and five enamel spray paints—intended for home use from stores in 10 cities across the country. The group also purchased paints from online sellers and e-platforms. The paints represented 40 different brands produced by 39 manufacturers, mostly from Indian micro- and small-sized manufacturing industries (MSMIs). All paints were analyzed by an accredited laboratory in the United States of America for their lead content, based on dry weight of the paint. The paint samples were analyzed using method EPA3050B/7000B, i.e., through acid digestion of the samples, followed by Flame Atomic Absorption Spectrometry, as recognized by the WHO as appropriate for the purpose.⁵ The laboratory participates in the Environmental Lead Proficiency Analytical Testing (ELPAT) program operated by the American Industrial Hygiene Association (AIHA), assuring the reliability of the analytical results.

⁵ World Health Organization, Brief guide to analytical methods for measuring lead in paint. 2011, WHO Library Cataloguing-in-Publication Data.



Results

Forty-six out of 51 analyzed solvent-based paints for home use (90 percent of paints) were lead paints, i.e., they contained lead concentrations above 90 parts per million (ppm, dry weight of paint). This is also the regulatory limit for lead in decorative paint in e.g., Nepal, Bangladesh, China, South Korea, the Philippines, Iraq, Jordan, Saudi Arabia, Ethiopia, Kenya, Cameroon, Tanzania, Colombia, and the United States of America. Moreover, 39 paints (76 percent of paints) contained extremely high lead concentrations at 10,000 ppm or more. The highest lead concentration detected was 250,000 ppm in a yellow enamel decorative paint sold for home use.

On the other hand, five out of 51 analyzed paints (10 percent of paints) did not contain intentionally added lead,⁶ suggesting that the technology to produce paint without lead ingredients exists in India.

Thirty-five out of 40 analyzed brands (88 percent of paint brands) sold at least one lead paint, i.e., a paint with lead concentration above 90 ppm. Also, 31 out of these 40 analyzed brands (78 percent of paint brands) sold at least one lead paint with extremely high lead concentrations at 10,000 ppm or more.

This study shows that yellow paints most frequently contained extremely high lead concentrations above 10,000 ppm. Of 34 yellow paints, 29 (85 percent of yellow paints) contained lead levels above 10,000 ppm, and of 16 red paints, 10 (62 percent of red paints) contained lead levels at 10,000 ppm or more.

The 11 solvent-based paints with the highest lead content are summarized in Table 1.

In general, paint can labels did not carry meaningful information about lead content or the hazards of lead paint. Only four out of 51 paints (8 percent of paints) provided information about lead on their labels, i.e., “lead free paints” and “lead content does not exceed 90 ppm.” Among these, two lead-containing enamel decorative paints from one brand were falsely marked as “lead free paints” despite containing 81,000 ppm and 26,000 ppm lead levels.

Most paints carried little information about any ingredients on can labels. Most paints were merely labeled as “solvents, pigments and resin,” with no further details on the type of solvents

⁶ There were five paints with lead concentrations reported as “less than 200 ppm” and “less than 100 ppm.” In this report, we say that these five paints did not contain “intentionally added lead.” Intentionally adding lead compounds to paint either as pigment or drier will yield concentrations of lead that are higher than 200 ppm. According to Module A-3 (Paint Basics) of UNEP’s *Toolkit for Establishing Laws to Eliminate Lead Paint*, “Lead-based pigments may contribute around 1,500 ppm to over 100,000 ppm” concentrations of lead in paint, while “lead-based driers may contribute around 1,200 ppm to 6,000 ppm” concentrations of lead in paint. (<https://wedocs.unep.org/bitstream/handle/20.500.11822/37030/PAINT.pdf?sequence=3&isAllowed=y>, p.14-15)

and pigments (organic or inorganic) provided on paint can labels. Warning symbols on most of the paint cans indicated the flammability of the paints, but no precautionary warnings on the effects of lead dust to children and pregnant women were provided.

Manufacturing dates were included on the labels of 49 out of 51 paints (96 percent of paints) included in this study. The batch numbers of 17 out of 51 paints (33 percent of paints) were provided on the labels.

Table 1. Top 11 Solvent-Based Paints with the Highest Lead Content.

Rank	Sample No.	Brand	Manufacturer	Color	Lead Content (ppm)
1	IND-437	Cosmo (enamel decorative)	Jaina Paints & Chemicals Industries	yellow	250,000
2	IND-421	Opel Paints (enamel decorative)	Opel Paints	yellow	120,000
3	IND-417	Sun Gold (enamel decorative)	Vasco Paints & Chemicals	yellow	81,000
4	IND-416	BANNA (spray paint)	Banna Aerosol	yellow	74,000
5	IND-441	Glaxci (enamel decorative)	Glaxci Paints Pvt. Ltd.	yellow	73,000
6	IND-439	BCC Paints (enamel decorative)	Carlo Paints & Chemicals Pvt. Ltd.	red	66,000
7	IND-440	BCC Paints (enamel decorative)	Carlo Paints & Chemicals Pvt. Ltd.	yellow	64,000
8	IND-411	Apnalike (enamel decorative)	Star Chemical Company	yellow	62,000
9	IND-423	Fine lac (enamel decorative)	Mercury Agency	yellow	56,000
10	IND-434	Spark (enamel decorative)	Kumar Paints India Pvt. Ltd.	yellow	53,000
11	IND-442	Pan (enamel decorative)	Rounak Paint Works	yellow	53,000

The results of the four studies conducted by Toxics Link and IPEN in 2015, 2018, 2020, and 2023 showed similar results—an astoundingly large number of lead paints continue to be sold in the market despite the adoption of a regulation on household and decorative paints in 2016. For example, the study conducted in 2015 prior to the issuance of the lead paint regulation showed that 95 percent of 101 analyzed paints had lead content above 90 ppm. The situation barely changed in the current study—90 percent of 51 analyzed paints still had lead content above 90 ppm. Moreover, the percentage of paints with lead levels above 10,000 ppm has worsened—from 46 percent of 101 paints in 2015 to 76 percent of 51 paints in 2023. It should be noted



though that the current study included locally produced paints from micro- and small-sized manufacturing industries (MSMIs) and paints that have not been tested yet by Toxics Link and IPEN. Paints from major brands which passed 90 ppm in previous studies were excluded in this study.

Six enamel decorative paints analyzed in previous studies were also analyzed in this study. All six paints remained non-compliant with the legal limit and still contains intentionally added lead in 2023.

Table 2. Comparison of Lead Concentrations in Some Solvent-Based Paints.

Sample No.	Brand Name	Color	2023 Lead Content (ppm)	2020 Lead Content (ppm)	2018 Lead Content (ppm)	2015 Lead Content (ppm)	Remarks
IND-417	Sun Gold (enamel decorative)	yellow	81,000	-	-	68,000	Still contains "intentionally added lead" (possibly lead pigment) similar to 2015
IND-434	Spark (enamel decorative)	yellow	53,000	118,417	-	-	Still contains "intentionally added lead" (possibly lead pigment) similar to 2020
IND-404	National (enamel decorative)	yellow	34,000	-	-	97,000	Still contains "intentionally added lead" (possibly lead pigment) similar to 2015
IND-452	Johnson (enamel decorative)	yellow	22,000	-	99,050	116,000	Still contains "intentionally added lead" (possibly lead pigment) similar to 2018 and 2015
IND-410	Parachute (enamel decorative)	red	3,700	36,829	-	-	Still contains "intentionally added lead" (possibly lead pigment or lead drier) similar to 2020
IND-425	York (enamel decorative)	yellow	1,900	-	85,427	52,000	Still contains "intentionally added lead" (possibly lead pigment or lead drier) similar to 2020 and 2018

Conclusions

This study demonstrates that paints for household and decorative uses with high concentrations of lead—most of which were locally produced by micro- and small-sized manufacturing industries (MSMIs)—are still sold in Indian markets despite the adoption of a regulation in November 2016, which entered into force one year after. However, the fact that major brands—many of which were excluded in this study—had lead levels below 90 ppm based on previous studies indicates that the technology to produce paints without lead additives exists in India. The study also indicates the high possibility of lead exposure in low socio-economic strata and that the health impact of lead will further add on the economic burden on them.

The current study results provide strong justification to strengthen compliance monitoring and enforcement mechanisms to ensure adherence to the national ban on the manufacture, import, export, distribution, sale, and use of household and decorative paints with total lead concentrations greater than 90 ppm.

Recommendations

In the interest of upholding the national ban on lead-containing household and decorative paints, thereby protecting the health of children and other vulnerable populations, Toxics Link and IPEN propose the following recommendations:

For Government and Government Agencies

In 2022 Niti Ayog, a government think-tank, has conducted studies on intensity of lead poisoning in India, particularly of children, and considered it as serious health crisis. It has recommended for a national mission to effectively and comprehensively tackle lead contamination in the country from multiple sources including paints and also suggested periodic monitoring to ensure proper compliance of the existing rules.

In this context, to ensure the safety of consumers' health and the environment, regulatory agencies need to work upon stricter implementation of the regulation on the lead content of household and decorative paints and conduct continuous monitoring schemes to ensure the paint industry's compliance with the exiting lead in paints rules 2016. They also need to ensure that companies must display sufficient information indicating harmful content on paint can labels such as lead, pigments, solvents etc. and provide a warning on possible lead dust hazards.



For the Paint Industry

In India major brands have shifted to lead free paints. There are also some paint micro- and small-sized manufacturing industries (MSMIs) that have shifted to lead free paints. However, the present study reflected that large number of MSMIs are still producing lead-containing paints. So, they should take efforts to follow the practices of other MSME and larger paint industries and expeditiously stop the use of leaded paint ingredients in their paint formulations. Paint companies that have shifted to non-lead paint production can get their products certified through independent, third-party verification procedures to increase the customer's ability to choose paints with no added lead.

For Individual, Household, and Institutional Consumers

Paint consumers should demand paints with no added lead from paint manufacturers and retailers, as well as full disclosure of a paint product's content. Institutional consumers should ask for, consciously buy, and apply only paints with no added lead in places frequently used by children such as homes, schools, day care centers, parks, and playgrounds.

For Organizations and Professional Groups

Public health groups, consumer organizations and other concerned entities should conduct awareness activities to inform the public and to protect children from lead exposure through lead paint, lead in dust and soil, and other sources of lead.

For All Stakeholders

Stakeholders from the government, business and industry, health care sector, academia, and the civil society should actively support policies and programs that will contribute to the reduction of children's, women's, and workers' exposures to lead from lead-containing paint, as well as from lead-contaminated dust and soil towards a lead-safe future for all.

