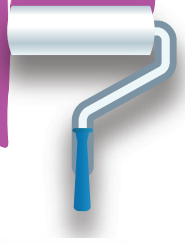
LEAD IN PAINTS IN INDIA

CONCERNS AND CHALLENGES

2018



A Study By

Toxics Link
for a toxics-free world

IPEN
a toxics-free future

About Toxics Link

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, provide cleaner alternatives and bring together groups and people affected by this problem. Toxics Link's Mission Statement - "Working together for environmental justice and freedom from toxics. We have taken upon ourselves to collect and share both information about the sources and the dangers of poisons in our environment and bodies, and information about clean and sustainable alternatives for India and the rest of the world." Toxics Link has a unique expertise in areas of hazardous, medical and municipal wastes, international waste trade, and the emerging issues of pesticides, Persistent Organic Pollutants (POPs), hazardous heavy metal contamination etc. from the environment and public health point of view. We have successfully implemented various best practices and have brought in policy changes in the aforementioned areas apart from creating awareness among several stakeholder groups.

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TABLE OF CONTENTS

List of Tables and Figures

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LIST OF ABBREVIATIONS

CPCB Central Pollution Control Board
CSO Civil Society Organisation
GAELP Global Alliance to Eliminate Lead Paint (GAELP)
ICCM International Conference on Chemicals Management (ICCM)
IPEN International POPs Elimination Network
SAICM Strategic Approach to International Chemicals Management
SME Small and Medium enterprises
UNEP United Nations Environment Programme
WHO World Health Organisation

UNITS OF CONCENTRATION

µg/dL Microgram per deciliter.

EXECUTIVE SUMMARY

Lead, a toxic heavy metal has been used in household and decorative paints for many years. Its wide usage has bought many human and environmental health hazards to notice. Being a cumulative toxicant, it causes Lead Poisoning in humans, thus accumulating in the body and targeting specially our neurological system, putting young children and pregnant women at a higher risk.

Considering the quantum of health impacts, the issue has been addressed globally and many countries have phased out lead from their paints. India decided to bring in the regulations very recently, i.e. in November, 2016 with maximum 90 ppm lead content in paints. However, even before the regulations were notified many leading brands voluntarily adopted 90ppm limit.

Even though the leading brands had shifted, the Small and Medium scale Enterprises (SMEs) are still a matter of concern for the country. Thus, this study was conducted to assess the compliance of lead in paints regulation by SMEs and to check the level of awareness among the consumers and the paint retailers.

To check the level of lead content in paints, locally manufactured paint samples were collected with the help of our NGO partners from nine states in the country (Andhra Pradesh, Delhi, Gujarat, Jharkhand, Kerala, Uttar Pradesh, Maharashtra, Manipur and Rajasthan) and were analyzed using CPSC-CH-E1003-09 (Inductively Coupled Plasma (ICP) spectroscopy method in a NABL accredited laboratory (SPECTRO analytical lab. Ltd., Okhla, New Delhi). The study targeted the samples in two categories- manufactured pre-regulations and manufactured post regulations. The results found very high concentration of lead even in the samples manufactured after the regulations. Highest concentration of lead viz. **1, 99,345 ppm** and **1,72,921 ppm** of lead was found in **Addison** (manufactures September 2017) and **Flora** (manufactured June, 2018) respectively. A few brands also had low lead content viz. **15 ppm in Indigo** (manufactured August 2017) and **28 ppm** in **Home case glossy** (manufactured September 2018).

In order to check the awareness levels, the study conducted two surveys- Consumers and Retailers. The surveys were conducted in eight states across the country (Andhra Pradesh, Delhi, Gujarat, Haryana, Jharkhand, Uttar Pradesh, Manipur and Rajasthan) with the help of our partner NGOs.

To understand the consumers' perspectives towards Lead in paints, 160 consumers were interviewed and the findings clearly pointed to critically low awareness amongst them with only 16% of the respondents being aware on the issue of lead in paints. The lack of awareness can be attributed to many reasons with the most prominent being negligible percolation of information from the retailers with only 1% respondents mentioning to be informed by the retailers about lead containing/lead free paints.

For the retailer study, 20 retailers were interviewed. The study found low level of awareness about the issues associated with Lead in paints as well the regulation. Only 32% retailers were aware about the presence of Lead in paints and 13% were aware about the national regulation on lead content in household paints. One of the major reasons for lack of awareness was minimal initiatives from the manufacturers end as only 17% respondents mentioned that the manufactures took any initiative to guide them on the issue. Since, the awareness is low; there is very little (7%) demand from the consumer end for lead free paints.

The study concluded that even though the regulations were notified back in 2016 and came into force in November, 2017, the country has a long way to go in order to reach the desired compliance levels. High concentration of lead content indicates poor compliance on the part of SMEs to adhere to the regulation and inadequate monitoring system in place to enforce the standards.

A number of recommendations are provided to improve the status of lead in paints in the country:

- **Government of India needs to take steps to improve compliance**
  - Strengthening monitoring system
  - Raising public awareness through media (digital, paper or social), radio or TV shows
  - Facilitate technical and/or financial assistance to the SMEs to shift to lead free technology
  - Develop a suitable plan for disposal of obsolete paints.
- **Paint industry can take the following steps**
  - Create and distribute information materials to aware vendor/retailers with an aim of increasing consumer awareness.
  - Organize periodic awareness programs for the retailers
  - Produce Lead safe paints as per the regulation
- **Consumers:**
  - Check the labels on paints to avoid purchasing lead containing paints.
  - Inquiring about lead safe paints, health hazards associated with lead paints from the vendors.

CHAPTER 1
INTRODUCTION

1.1 About Lead in paints

Lead is a heavy metal naturally found in the Earth's crust. It has many commercial uses, such as manufacturing of lead-acid batteries, addition in pigments and paints, solder, ammunition, ceramic glazes, jewellery, toys and also in some cosmetics and traditional medicines.

Lead has found to be commonly used in household paints since ages giving rise to **"Lead laden paints" or "Lead Paint"**. Lead paint is paint or a similar coating material to which one or more lead compounds have been added[1]. Lead compounds are generally intentionally added to paints to give it certain properties such as color, shine, durability and reduced corrosion on metal surfaces or faster drying time. For the same reasons, lead compounds may be present in other types of coatings, including varnishes, lacquers, enamels, glazes and primers. Lead additives are most commonly used in solvent-based paints due to their specific chemical properties; such solvent-based lead paints and coatings are still widely available and are being used in many countries. Water-based latex paint, on the other hand, rarely contains intentionally added lead compounds. The most commonly used lead pigments are lead chromates and lead molybdates which are bright yellow, orange or red in color[2].

1.2 Household paints and Lead poisoning

Lead poisoning occurs due to excessive exposure of lead to humans. The most common route of exposure is found to be ingestion. Lead is ingested mostly by young children by a common practice of licking the doors and windows or eating dried paints. Lead exposure occurs over a short space of time (acute poisoning) or over a prolonged period (chronic poisoning). No safe level of exposure to lead has so far been identified[3]. However, some health authorities have defined excessive exposure when the blood lead level exceeds 5 µg/dL in children's less than six years of age[4].

Lead poisoning mostly occurs due to dried off paints, as it starts to decay and its dust contaminates the entire environment putting human health at risk. The removal of lead paint is another major reason for increased lead concentration in the home environment, if not done in a safe manner. Lead paints can remain a source of exposure for many years into the future. Even in countries that banned lead paint decades ago there are still many homes where lead painted surfaces can be found[5].

1 Model Law and guidance for regulating lead paint, The United Nations Environment Programme Revised July 2018
2 http://wedocs.unep.org/bitstream/handle/20.500.11822/14806/module_ai_lead_paint_v5%20Feb%202017.pdf?sequence=1&isAllowed=y
3 http://www.who.int/ipcs/lead_campaign/QandA_lead_2017_en.pdf
4 http://www.who.int/ipcs/lead_campaign/QandA_lead_2017_en.pdf
5 http://www.who.int/ipcs/lead_campaign/QandA_lead_2017_en.pdf

1.3 Human health impacts

Lead is a cumulative toxicant that poses serious risks to the environment and human health. The World Health Organization[6] lists lead exposure as one of the top ten environmental health threats globally.

Lead exposure has known to cause multiple health affects (both acute and chronic) in all age groups. It accumulates in the body and affects practically all organ systems[7]. Young children and pregnant women are most vulnerable to the lead poisoning even at low concentrations because the nervous system of the child is in a developing stage. Children getting exposed to lead in early childhood are prone to reduction in cognitive abilities, dyslexia, attention deficit disorder and antisocial behavior. Lead exposure can also lead to hypertension, renal impairment, immunotoxicity and toxicity to the reproductive organs. Absorption of large amounts of lead can cause coma, convulsions and even death. Children who survive severe lead poisoning can be left with permanent neurological injury such as deafness and mental retardation[8].

Though, lead poisoning is preventable, the Institute for Health Metrics and Evaluation has estimated that, based on 2016[9] data, lead exposure accounted for 5,40 000 deaths and 13.9 million years lost to disability and death due to long-term effects on health, with the highest burden in developing regions.

In India, the health impacts of the toxic metal was recorded as early as 1999, when a study by George Foundation revealed that over 51 % of the children below the age of 12 living in major urban areas of India had unacceptably elevated levels of blood lead of 10 µg/dL or more. A number of studies followed since then and a study by Nichani. et. al., 2006 and Singh & Singh 2006 pointed out to the reduction in lead poisoning after Government of India imposed a ban on use of leaded gasoline (petrol) in 2000. Still in 2003, 33.2 % of the 754 tested children in Bombay (Mumbai) had blood lead levels C10 µg/dL (Nichani. et. al., 2006). In yet another study conducted among 107 school children's in the city of Mangalore, India, Kuruvilla. et. al., 2004 have identified lead in paints as the likely source of exposure for 10 children with blood lead levels above 40 µg/dL[10].

1.4 Economics of Lead in Paints

Lead exposure also comes along with a huge economic cost (both direct and indirect) which is mostly ignored. According to World Health Organization (WHO)[11], lead is responsible for 0.6% of the global burden of disease, with some 600,000 new cases of children with intellectual disability

6 WHO, 2015
7 http://www.who.int/ipcs/lead_campaign/QandA_lead_2017_en.pdf
8 http://www.who.int/ipcs/lead_campaign/QandA_lead_2017_en.pdf
9 http://www.who.int/ipcs/lead_campaign/en/
10 Lead Content in New Decorative Paints in India, 2013
11 World Summit on Sustainable Development, Plan of Implementation, paragraph 57 ; Strategic Approach to International Chemical Management SAICM (2006); International Conference on Chemicals Management (ICCM 2), Resolution II/4 B (2009).

arising every year. By contrast, the economic cost of eliminating the use of lead in many paints is known to be low, as a number of manufacturers have already reformulated their products to avoid the intentional use of lead.

The economic burden which is not taken into account by the manufactures is eventually borne by the consumers especially in the low and middle income countries. Estimated annual costs (in international dollars) of lead exposure by global region, based on loss of IQ, include: **Asia – $699.9 billion**; Africa – $134.7 billion and Latin America and the Caribbean – $142.3 billion[12].

1.5 International developments on Lead in paints

Over the years, the issue of lead in household paints has been identified as a global concern. The issue was first addressed at an International Conference on Chemicals Management (ICCM), in 2009 where it was consensually agreed to be an international priority issue of concern. India participated in the conference and accepted the decisions taken thereof.

In response to the ICCM decision, the United Nations Environmental Programme (UNEP) and the World Health Organization (WHO) jointly initiated a global partnership- Global Alliance to Eliminate Lead Paint (GAELP) to eliminate the use of lead compounds in paints in order to protect public health and the environment[13]. The aim of GAELP is to prevent children's exposure to lead, to phase out the manufacture and sale of paints containing lead and eventually, to eliminate the risks from such paints.

In the third meeting of ICCM held in Nairobi in 2012, a strategy was developed for global plan of action to phase out lead in paints. The Conference agreed by consensus to call upon governments, civil society organizations, and the private sectors to contribute to GAELP in various ways including:

- Raising awareness about the toxicity to human health from lead in paint including for young children, paint users, and the workers in paint production facilities;
- Filling information gaps by analyzing paints for their lead content in countries where little or no data is available;
- Promoting national regulatory frameworks, as appropriate, to stop the manufacture, import, export, sale and use of lead paints and products coated with lead paints;
- Encouraging paint manufacturing companies to substitute lead compounds added to paint with safer alternatives; and
- Establishing prevention programs to reduce exposure in and around housing, childcare facilities, schools and other buildings where lead paint has been used in the past. [14]

12 https://wedocs.unep.org/bitstream/handle/20.500.11822/22417/Model_Law_Guidance_%20Lead_Paint.pdf?sequence=7
13 http://toxicslink.org/docs/lead_in_paints/Lead-in-Paint2013.pdf
14 http://toxicslink.org/docs/lead_in_paints/Lead-in-Paint2013.pdf

1.6 Status of Lead in paints in India

1.6.1 History of phase out of lead in paints

India witnessed a long struggle in reaching the current lead in paint regulation and it dates back to the year 2007 in which Toxics Link released its first report with an alarming concentration of lead **1, 40,000 ppm** was detected in many of the leading paint brands manufactured in the country.

Subsequently, two reports were released by Toxics Link in the year 2009 and 2011 and high concentration of Lead was detected in some of the leading paint manufacturers in the country. However, with sustained campaign and dialogue with the industries, a gradual phase out of lead from paints was attained by the leading producers. Further, in the year 2013 and 2015 studies conducted by Toxics Link established the fact that though the leading brands have phased out lead from enamel paints, high level of lead in the small and medium scale manufacturer emerged as a major concern. However, the Government's initiative to bring the regulation in 2016 has paved the way for lead free paints in India.

1.6.2 Lead in Paints Regulation

The government of India notified the **"Regulation on Lead contents in Household and Decorative Paints Rules, 2016"** on 1st November, 2016 which came into force from 1st November, 2017[15]**.**

Salient features of the regulations are:

- **Prohibition**: Prohibition of manufacturing, trade, export and import of household and decorative paints containing metallic lead in concentration exceeding 90 parts per million.
- **Self Certification**: Household and decorative paints manufactured or imported after November, 2017 should have the label: "Lead contents does not exceed 90 parts per million" along the manufacturing/importing date.
- **Transitory Provision**: The rules have allotted a time period of two years to paints manufactured before the commencement of rules to sell their stock and further comply with the rules.
- **Testing:** The manufacturers and importers are also required to get their products tested once a year before putting them in supply chain. The rule also has identified Central Power Research Institute as the authorized testing agency.

Later on 31st October, 2017 the Central Pollution Control Board notified Procedure for Measurement of Lead contents in Household and Decorative Paints- Reg. explaining the applicability, requirements and testing procedure for the Lead in Paint Regulations. The document provides details on the assessment of existing and new paints and provides sampling and testing protocol. It also entails the procedure for analysis of Lead in Paint and list out authorized agencies for testing, implementation and monitoring.

15 http://www.moef.nic.in/sites/default/files/final%20notification_Lead%20in%20Paints.pdf

CHAPTER 2
RESEARCH METHODOLOGY

2.1 Objectives of the study

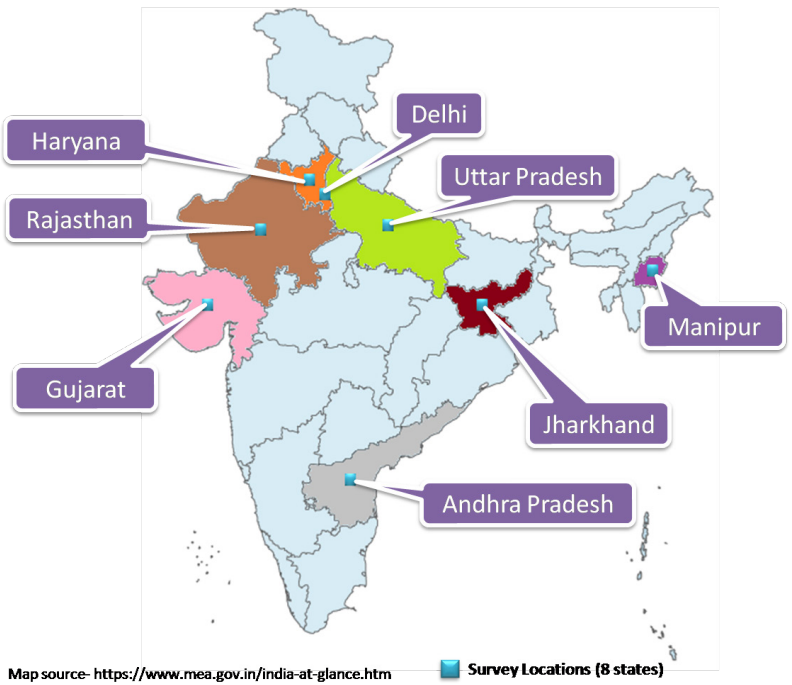
The study has the following objectives:

- To get an overall status of compliance of Lead in paints regulation in India which came into force from November 2017.
- To get the current data on lead content in paints manufactured in India.
- To check level of awareness among the consumers on lead in paints issue.
- To understand retailers understating and their approach towards the issue of lead in paints.
- To reach out to as many as consumers and paint retailers and make them aware on the lead in paints issue and the regulation.

2.2 Study Locations

- The paints samples were collected from Andhra Pradesh, Delhi, Gujarat, Jharkhand, Kerala, Uttar Pradesh, Maharashtra, Manipur and Rajasthan.
- The consumers and retailers survey were conducted in Andhra Pradesh, Delhi, Haryana (Faridabad & Bahadurgarh), Gujarat, Jharkhand, Manipur, Rajasthan and Uttar Pradesh.

FIGURE 1
LOCATION OF LIP SURVEY DATA COLLECTION



2.3 Study Methodology

Previous studies conducted by Toxics link have established the fact that Lead is used in very high concentration in Enamel paints and the major paint brands have stopped using lead. Hence, the focus of the present study is to assess the lead content in the locally available brands which are mostly SMEs and they have a fare share in the local level market. Further, the study also tries to capture the perspectives of consumer as well as the retailers towards the issue of lead in paints.

2.3.1 Sampling

Paint samples were collected from eight states across the country with the help of our partner organizations and following steps were followed:

- A Market survey was conducted to check:
  - Most demanded local paints
  - ISI marked paints
  - Instructions like no added lead/ lead limits or other lead related instructions on the box.
- A list of some most demanded local brands was prepared and shared with Toxics Link
- After approval, 3-4 paint samples (Two of each) of 200 ml to 1ltr (based on the availability) were bought from the local market.

2.3.2 Testing

Toxics Link collected 42 cans of enamel decorative paints from various places in India which includes Delhi (8), Rajasthan (9), Uttar Pradesh (4), Gujarat (2), Maharashtra (2), Andhra Pradesh (3), Kerala (9), Jharkhand (3) and Manipur (2). Out of which 32 samples were prepared and analyzed in the current study.

These paints from 32 different brands were produced by 31 manufacturers. Based on our previous experiences, largely bright and dark colors such as yellow, red, golden, black and green color paints were considered for the testing. However, it also includes white, smoke grey, etc. The availability of these paints in retail establishments suggested that they were intended to be used within home environments. The study excluded automotive and industrial paints that are not typically used for domestic housing applications or for painting toys.

During the paint sample preparation, information such as color, brand, manufacturing country, purchase details, date manufactured as provided on the label of the paints were recorded. The formats used for date of manufacturer varied with some companies providing day, month and year and others providing only month and year. In addition, some paint companies used only a single word to describe some colors, such as **"red"** while others used **"bright red/ P.O. Red"**. Colors were recorded as provided on the cans. Dates of purchase were recorded in the day/ month/year format in most cases.

Each can was thoroughly stirred and was subsequently applied onto individually numbered transparent glass plates. Each stirring utensil and paintbrush was used only once, and extra caution was taken to avoid cross contamination. All samples were then allowed to dry at room temperature for five to six days. After drying, the glass plates were placed in individual resealable plastic bags and were sent to a NABL accredited laboratory (SPECTRO analytical lab. Ltd., Okhla, New Delhi) for analysis of total lead content of dry weight of the paints. The paint samples were analyzed using method CPSC-CH-E1003-09 (Inductively Coupled Plasma (ICP) spectroscopy, as recognized both by WHO and the United States Consumer Product Safety Commission as appropriate for the purpose.[16,17]

FIGURE 2 SAMPLE PREPARATIONS FOR TESTING

2.3.3 Survey Methodology

The survey was conducted for consumers and retailers on the issues of lead in paints and the new regulation promulgated by the Government of India in 2016 to restrict the use of lead in paints. Refer to Annex 1 and 2 for the questionnaires.

Moreover, the survey was designed as an **Action Research** with an objective to problem solving methods which is to create awareness among the respondents and retailers on lead in paints, health hazards and lead in paints regulation as well.

The survey was conducted in eight states of India namely, Rajasthan (Dausa), Uttar Pradesh (Noida/Ghaziabad), Delhi, Haryana (Faridabad, Bahadurgarh), Manipur, Andhra Pradesh, Jharkhand and Gujarat involving 160 consumers and 40 retailers. Refer to Annex 3 for the survey methodology.

16 WHO Library Cataloguing-in-Publication Data (2011). Brief guide to analytical methods for measuring lead in paint. http://www.who.int/ipcs/assessment/public_health/lead_paint.pdf

17 United States Consumer Product Safety Commission, Directorate for Laboratory Sciences, Division of Chemistry (2009). Test Method: CPSC-CH-E1003-09 Standard Operating Procedure for Determining Lead (Pb) in Paint and Other Similar Surface Coatings https://www.cpsc.gov/PageFiles/128129/CPSC-CH-E1003-09.pdf

CHAPTER 3
RESULTS AND DISCUSSION

3.1 Results

3.1.1 Testing Results

In the present study thirty two samples were analyzed for total lead content. The results are analyzed on the basis of the paints production date before and after the implementation of the rules from November 2017.

3.1.1.1 Results of the Samples manufactured between October 2016 and November 2017

- Total 12 samples (of SMEs paint manufacturers) manufactured between October 2016 and November 2017 were analyzed.
- None of the brands were labeled with the information about its lead content.
- Out of these 12, only one sample namely **Indigo** was found with lead level below 90 ppm (Indian standard for lead in paint).
- All other 11 samples showed varied levels of lead ranging from 911 ppm to 199345 ppm.
- The highest lead (199345 ppm) was observed in a brand called **Addison** (golden yellow in color) collected from Kerala and manufactured in Chennai.
- The source of lead in this could be from drier use in the paints. The drying agent is added to some solvent-based paints to catalyze the reaction resulting in hardened cross-linked polymer networks that bind the pigments to the painted surface[18].
  - Lead-based pigments may contribute around 1500 to >100 000 ppm, depending on whether they are mixed with other pigments or used alone. Red and yellow paints may have particularly high lead content[19].
  - Lead-based driers may contribute around 1200 to 6000 ppm or more, depending on whether they are mixed with other driers[20].

18 http://wedocs.unep.org/bitstream/handle/20.500.11822/14806/module_ai_lead_paint_v5%20Feb%202017.pdf?sequence=1&isAllowed=y
19 http://wedocs.unep.org/bitstream/handle/20.500.11822/14806/module_ai_lead_paint_v5%20Feb%202017.pdf?sequence=1&isAllowed=y
20 http://wedocs.unep.org/bitstream/handle/20.500.11822/14806/module_ai_lead_paint_v5%20Feb%202017.pdf?sequence=1&isAllowed=y

TABLE 1.1 LEAD CONCENTRATION IN PAINT SAMPLES MANUFACTURED BEFORE LEAD IN PAINTS REGULATION

S.No.	Code	Information about lead on the label	Brand name	Mfg Date	State	Colour	Results (in ppm)
1	TL-01	No	Casio	2017 Sept	Rajasthan	Signal Red	115603
2	TL-03	No	Nandni Paints	2017 Aug	Rajasthan	P O Red	32896
3	TL-05	No	Modi	2017 Aug	Rajasthan	Black	1279
4	TL-06	No	Classic	2017 Aug	Rajasthan	P O Red	31558
5	TL-08	No	Rexol	2016 Dec	Uttar Pradesh	J S Green	147364
6	TL-09	No	Brightolac Paints	2016 Oct	Uttar Pradesh	Mint Green	131404
7	TL-10	No	Samsons	2017 May	Uttar Pradesh	Bus Green	66662
8	TL-16	No	Addison	2017 Sep	Kerala	Golden yellow	199345
9	TL-19	No	Addison	2017 Oct	Kerala	DES Signal Red	911
10	TL-22	No	Indigo	2017 Aug	Delhi	Brown	15
11	TL-26	No	Home Light (Marshal Paints)	2017 April	Gujarat	Red	33337
12	TL-30	No	Wall Maax Crest	2017 Mar	Kerala	Brown	4223

3.1.1.2 Results of the Samples manufactured between December 2017 and September 2018

- Total 20 samples (of SMEs paint manufacturer) produced between December 2017 and September 2018 were analyzed.
  - 8 samples out of 20 (manufactured by 5 brands) were labeled with their lead content (no added lead /contained less than 90 ppm of lead)
- Out of these 20, only three samples namely, Home Care glossy (White), Varlac Premium Satin Enamel (Olive) and Varlac Premium Satin Enamel (Cherry Red) were found with lead level less than 90 ppm (Indian standard for lead in paint).
- Two other samples namely, British Paints (Bus Green) and British Paints (Oxford Blue) found low level i.e. 101 and 130 ppm of lead (though it does not comply as per the Indian standard for lead in paint but it is comparatively low)
- Remaining 15 samples were found with very high levels of lead ranging from 2117 ppm to 172921 ppm. Out of these 15, two samples viz. Sun Gold (Smokey Grey) and Home Care Glossy (Red) that were labeled with their lead content information (below 90 ppm) had high concentration of lead (2117 ppm and 41165 ppm) thus raising a big question on the compliance of lead paint regulations 2016.

TABLE 1.2 LEAD CONCENTRATION IN PAINT SAMPLES MANUFACTURED AFTER LEAD IN PAINTS REGULATION

S.No.	Code	Information about lead on the label	Brand name	Mfg Date	State	Colour	Results (in ppm)
1	TL-02	Not mentioned	New Reliance	2018 Jan	Rajasthan	Golden yellow	126615
2	TL-04	Not mentioned	Glaxy	2017 Dec	Rajasthan	Golden yellow	130797
3	TL-07	Not mentioned	Johnson	2018 Apr	Jharkhand	Golden Yellow	99050
4	TL-11	Not mentioned	Spark	2018 Apr	Delhi	P.O Red	42797
5	TL-12	Not mentioned	York	2018 Mar	Delhi	Golden Yellow	85427
6	TL-13	Not mentioned	Prolite	2018 Jul	Jharkhand	Golden Yellow	112351
7	TL-14	Not mentioned	Laxmi	2018 Jul	Maharashtra	Golden Yellow	143395
8	TL-15	Not mentioned	Colour Plus	2018 Jun	Maharashtra	Golden yellow	117717
9	**TL-17**	**Not Mentioned**	**Flora**	**2018 Jun**	**Andhra Pradesh**	**Golden yellow**	**172921**
10	TL-18	Not Mentioned	Super Deluxe	2018 Aug	Andhra Pradesh	Golden yellow	128211
11	TL-20	Yes	British Paint	2018 Jul	Delhi	Bus Green	101
12	TL-21	Yes	British Paint	2018 Jan	Delhi	Oxford Blue	131
13	TL-23	Yes	Sun Gold	2018 Mar	Delhi	Smoke grey	2117
14	**TL-24**	**Yes**	**Home Care (Glossy)**	**2018 Sep**	**Delhi**	**White**	**28**
15	TL-25	Yes	Home Care (Glossy)	2018 June	Delhi	Red	41165
16	TL-27	Not mentioned	Sunnrite (Rainbow Paints)	2018 Jan	Gujarat	Blue	8890
17	TL-28	Yes	Varlac Premium Satin Enamel	2018 Aug	Kerala	Olive	48
18	TL-29	Yes	Varlac Premium Satin Enamel	2018 Aug	Kerala	Cherry Red	41
19	TL-31	Not mentioned	Micolite	2018 Jan	Manipur	PO Red	81224
20	TL-32	Yes	Poinolac	2018 Jan	Manipur	Black	5432

3.1.1.3 Trend of Lead content in paints from 2013-2018

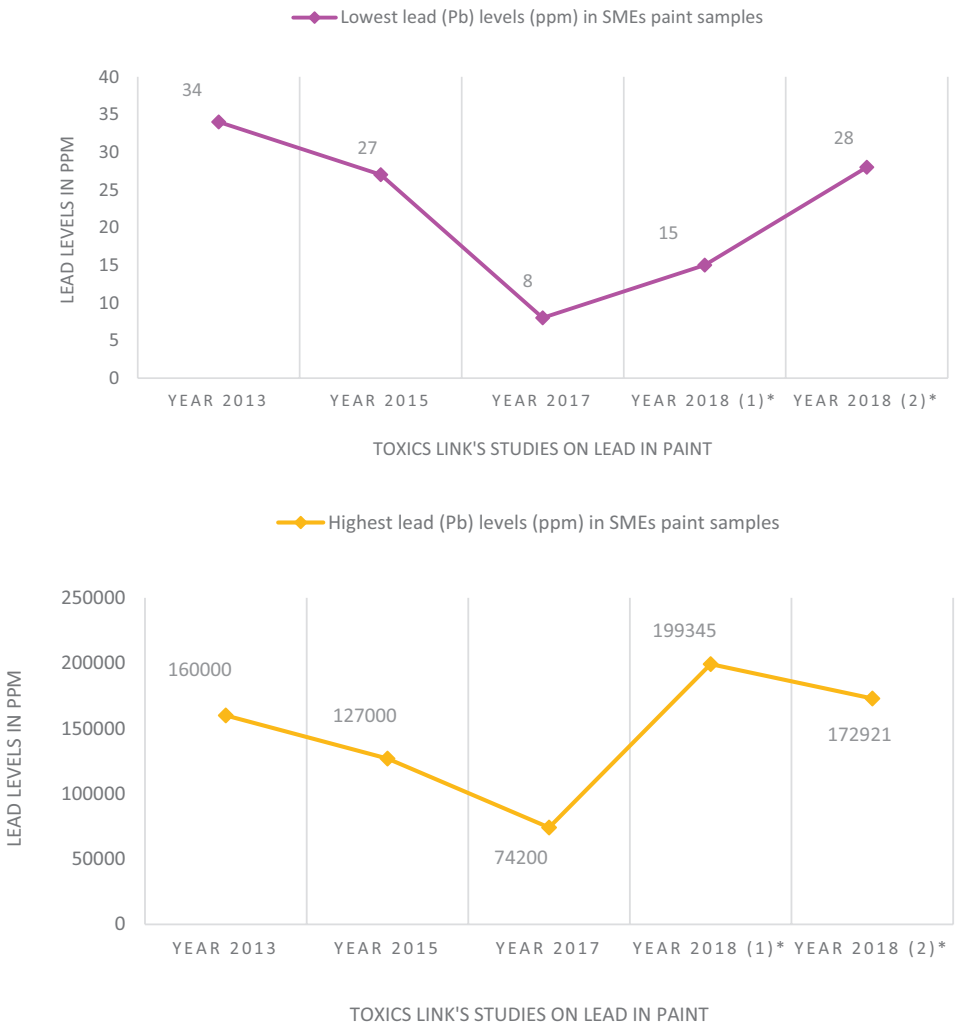


FIGURE 3 TREND OF LEAD CONCENTRATION (IN SMES PAINT) BETWEEN 2013 AND 2018 YEAR 2018 (1) REFERS TO THE SAMPLES ANALYZED IN 2018 STUDY AND MANUFACTURED BEFORE THE REGULATION; YEAR 2018 (2) REFERS TO THE SAMPLES ANALYZED IN 2018 STUDY MANUFACTURED AFTER THE REGULATION

3.2 Survey Results

3.2.1 Consumers Survey

A total of 160 respondents were interviewed for this study with a focus on getting information on family income, frequency of painting the house, awareness about the issue of lead in paints etc.

FIGURE 4 AWARENESS PROGRAMME IN DAUSA SCHOOL

FIGURE 5 AWARENESS PROGRAMME IN FARIDABAD SCHOOL

FIGURE 6 AWARENESS AMONG YOUNG CHILDREN OF DELHI

FIGURE 7 AWARENESS PROGRAMME AMONG SCHOOL CHILDREN IN FARIDABAD

3.2.1.1 Consumer's choice on Enamel paints:

The study focused on Enamel paints because of the intentional use of lead in this category of paints. The survey aimed to estimate the usage of enamel paints in households and it found that most of the respondents, 40% use enamel paints. On the other hand, 28% of the respondents who mentioned using distemper had annual incomes either below 1 lakh or they belonged to low middle class family. More than one third of the respondents expressed that due to lack of purchasing power or choice they buy distemper paints for their homes.

FIGURE 8 TYPE OF PAINTS USED IN HOMES

3.2.1.2 Brand preference:

When questioned about the brand preference most of the respondents, 58% expressed that they preferred to buy specific brands as they are mostly durable, cost effective and of good quality.

> *"We largely buy the leading brands as these brands gives better finish and it has good quality compared to other local brands"* (As per a government employee from Chongtham Leikai, Manipur).
>
> *"We like to buy the leading brands only as most these paints are durable and if we use these paints it can last for 3-4 years and in most cases they are budget friendly. I remember we used local brands to paint our house few years back and every year we had to paint our house. Hence, from last few years we are only using leading brands"(*As per the respondent from Tilapata Gaon, Dadri*).*

And with further analyses, it was found that 95% of the respondents use or prefer leading brands. Only 5% of the respondents use local brands and most of these consumers belongs to low income groups and preferred these paints because of low cost. The consumers have developed a preference for leading brands through the following reasons:

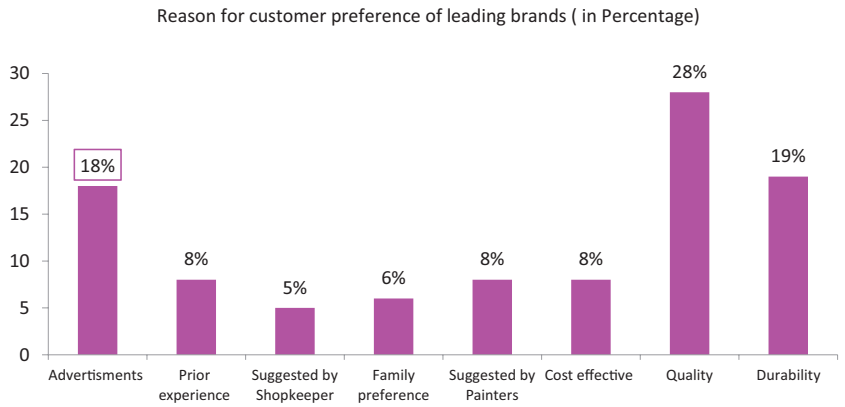


FIGURE 9 REASON FOR CUSTOMER PREFERENCE OF LEADING BRANDS (IN PERCENTAGE)

"As these leading brands are widely used in the house and secondly these brands are mostly suggested by our painter or their popularity in the market, availability are the sole reason we buy this paints" (as per a resident from Vadodara).

"We have been buying only the leading brands for our homes as these paints are good in quality compared to local brands and also cost effective as well (as per Tilapata gaon respondent)*".*

3.2.1.3 Awareness on labeling:

To understand the awareness levels in the consumers, the respondents were enquired if they purchase the paint themselves and most of the respondents, 55% agreed to not purchasing the paint themselves, they get it through the painters. 80% mentioned that they don't check the labels on the paint cans for the lead content on paints. On the other hands 20% of respondents expressed that they do check the information on paints cans for lead content label.

"We do check the labels for this information the paints should not contain lead, ammonia, or doesn't have any bad odour. Also, it should be of premium quality paints which give luxury feels and has no harmful chemicals" (As per a homeopathy doctor from Gujarat).

3.2.1.4 Factors contributing in making Informed choices

- Awareness of the consumers (through TV, Newspaper, social media etc.)
- Economic status of these consumers – more than one third of these customers were financially stable which makes it easy for them to choose the high end brands/ leading brands and their buying capacity also in a way shapes their choice or preference when it comes to buying paints.

3.2.1.5 Awareness on Lead in Paints

When enquired about the awareness on the presence of lead in paints, the survey findings indicated critically low levels with only 16% respondents being aware about the presence of lead in paints. This indicates that a large number of population was unaware and this issue has never been being discussed or is largely neglected despite of it being a human health hazard. As per a respondent *"I got to know about the presence of lead in Paints from newspaper article and social media yet I don't know about its health impacts on Children and women"* (respondent from Tilapata Gaon).

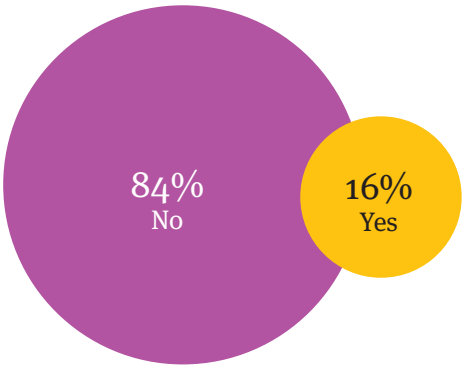


FIGURE 10 AWARENESS ON LEAD BEING USED IN PAINTS

3.2.1.6 Source of information on Lead in paints

- When understanding the percolation of information from the retailers to the consumers, the study showed similar results as the dealer survey. Since, most of the dealers are not aware about the issue and do not get any information from the manufacturers, they rarely inform or guide the consumers on it. The data shows that 99% of the respondents have never been informed by the vendor about lead in Paints. While concluding the survey, the respondents were informed about the health hazards of lead paints, about the regulation in

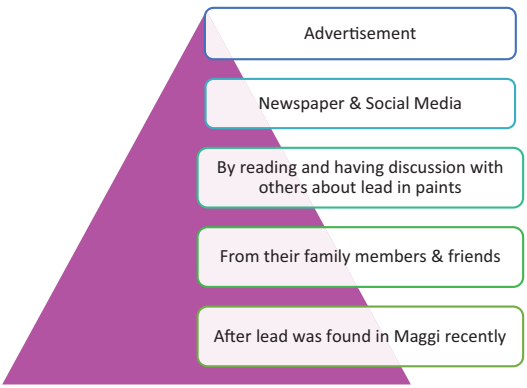


FIGURE 11 SOURCES OF INFORMATION ABOUT LEAD IN PAINTS

the country and were guided on the labels that should be checked before purchasing paints. Hence, 95% of the respondents expressed that they would prefer buying lead free paints even if they are expensive compared to lead containing paints.

"Most of us were not aware about lead safe paints and its impact on children or women in particular, now we don't want to wait for some kind of health impact to occur in the family and then shift the practice, even if these paints are little expensive compared to the lead containing paints we would buy lead free paints" (Trilokpuri, Delhi).

3.3 Retailers Survey

In this survey forty retailers were interview to check their awareness level on presence of lead in paints, leads in paints regulation and also to understand if there is any initiative by paint manufacturers to educate them about lead safe paints.

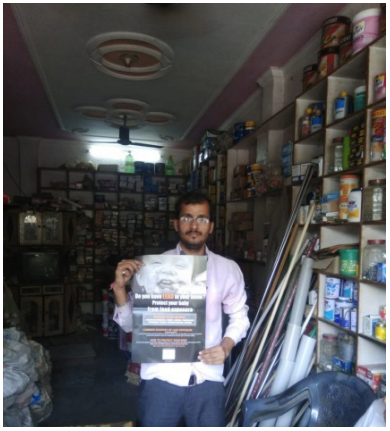


FIGURE 12 POSTER DISTRIBUTED TO A RETAILER IN DELHI

FIGURE 13 SURVEY CONDUCTED IN ANDHRA PRADESH

FIGURE 14 POSTER BEING DISPLAYED BY A RETAILER IN DELHI

3.3.1 Level of Awareness

The survey clearly pointed out to critically low level of awareness among the retailers on the issue of Lead in Paints. Only 32 % of dealers admitted to have some information on the issue through the following sources:

- Labeling on the Products
- Newspaper, articles and advertisement etc.
- Commercial from TV
- From family members & friends

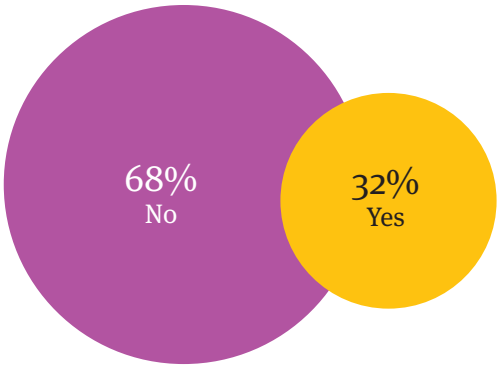


FIGURE 15 AWARENESS ON PRESENCE OF LEAD IN PAINTS

3.3.2 Awareness on regulation

Even though 32% of the respondents were aware about the issue of Lead in Paints only 13% were aware about the Lead in Paints Regulations while only 3% knew that lead containing paint cannot be sold after November 2019.

> *"We don't have lead in Paints regulation in our country. So, when the government will make such rule and they will intimate us and we will also be able to inform the customers as well"* (Retailer from Nyay Khand, Ghaziabad)

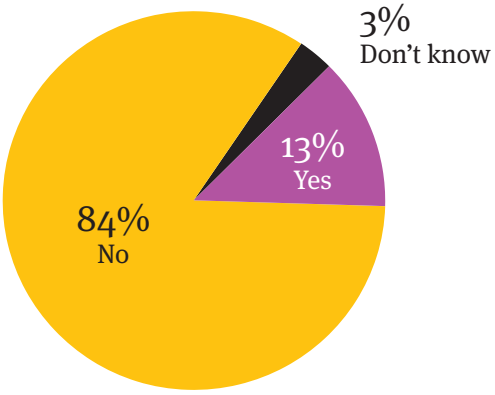


FIGURE 16 AWARENESS ON LEAD IN PAINTS REGULATION 2016

3.3.3 Initiatives by manufacturers

Low level of awareness among the dealers can be attributed due to negligible efforts by the manufactures to inform them about the issues associated with Lead in Paints. Only 17% respondents mentioned that the manufactures took any initiative to guide them on the issue.

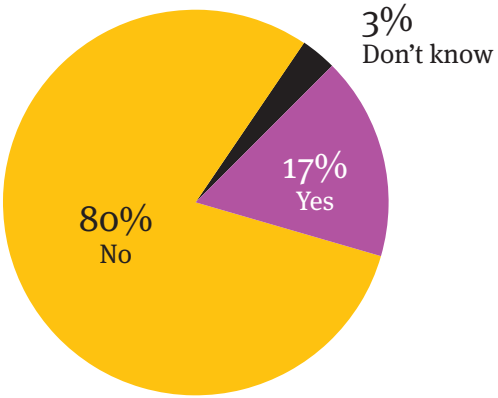


FIGURE 17 INITIATIVES BY MANUFACTURERS TO PROMOTE LEAD FREE PAINTS

3.3.4 Demand for Lead free paints

Since the awareness about the regulations and its provisions is quite low, the demand for lead free paints is also little (7%).

> *"Customers have never asked for lead free paints and majority of the customer don't know or they don't ask for lead free paints which are available in the market. They only care about the cost and expiry. Hence, we also don't take the initiatives of informing them"* (Paints retailer from Bhogal, Delhi)

CHAPTER 4

CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion:

1. **Paints with high lead content continue to be widely sold across India**

   The study found that lead level in paints varied from **15 PM** to **199000 PPM**. Thus, hardly any changes are happening on the ground despite of Lead in paints regulation being in force. Nevertheless the paint samples were collected from nine states of India and the study reflected that the overall scenario is more or less same across the country.

2. **Impact of Lead in paints is regulation is minimal**

   The Lead in paints regulation was promulgated in November 2016 and came into force from November 2017. One year transition period was granted so that the manufacturers can prepare themselves to shift to lead free paints and the regulations prohibits manufacturers to produce paints above **90 ppm**. However, the study results show that the presence of high lead level in most of the paints which indicates that the paint manufacturers are not abiding to the regulation. The most worrisome fact that came out from the study was most of the new paints which are manufactured after November 2017 have failed to adhere to the limit of **90 PPM**. The rules have prohibited the sale of paints above **90 PPM** after November 2017.

3. **Issue of labeling**

   The lead in paint regulations have mandated that a "No added lead" or "lead content less than **90ppm**" label is a mandatory requisite for the manufacturers. However, the study shows that barring few, most of the paints were not labeled as lead free. Further high level of lead has been detected in the paints which are labeled as Lead free. Thus it interferes that most of these manufacturers are not abiding with the Regulation on Lead contents in Household and Decorative Paints Rules, 2016.

4. **Low levels of awareness in retailers on lead in paints regulations**

   The study reveals that most of the retailers were not aware about the regulations in place. Though some of the retailers have an understanding on the issues associated with Lead but they were unaware about the implications of the regulation. During the survey it has been found that many of the retailers are still keeping the old stock of paints which cannot be sold after November 2019 and they have no information what to do with these paints.

5. **Issue of disposal of old stockpiles**

   The test results showed that the paints manufactured after November 2017 have high lead content and are still lying on the shelves of the retailers. Legally these paints cannot be sold after November 2019. However, the question arises how to dispose those old paints. The paint

can has been categorized as hazardous household waste under the Municipal Waste Rule 2016, so the absence of disposal plan can lead to serious environmental hazards.

6. **Abysmal consumer awareness**

   The survey results have shown that the consumers' awareness is extremely low across the country. And the survey further revealed that poor people are mostly buying lead containing paints as the high income group people prefers to buy the well known brands where the lead content is below **90 ppm**. Thus the poor are at the receiving end and are possibly getting impacted due to the presence of lead in paints.

7. **Small and medium scale manufacturers can produce lead paints below 90 ppm.**

   All the paints tested for this study were largely manufactured by the small and medium scale producers. Though many of the paints have high lead content however, still in some of these paints low level of lead was detected. Thus this indicates that small and medium scale producers are aware of the developments associated with lead paints including the health hazards from Lead and have the requisite technology to shift to lead free paints.

4.2 Recommendations:

- **Government of India need to take steps in to improve compliance**
  - Strengthening monitoring system;
  - Raising public awareness through media (digital, paper or social), radio or TV shows;
  - Facilitate technical and/or financial assistance to the SMEs to shift to lead free technology;
  - Develop a suitable plan for disposal of obsolete paints.

- **Paint industry can take the following steps**
  - Create and distribute information materials to aware vendor/retailers with an aim of increasing consumer awareness;
  - Organize periodic awareness programs for the retailers;
  - Produce Lead safe paints as per the regulation.

- **Consumers:**
  - Check the labels on paints to avoid purchasing lead containing paints;
  - Inquiring about lead free paints from the vendors.

ANNEXURES

ANNEX 1: Lead in Paints Consumer Survey

Date:

Time:

Profile of the Respondent

Name and Address	
Phone number:	
Occupation:	

1. **Annual Income:**
   - Below 1 lakh per annum
   - 1-2.5 lakh per annum
   - 2.5-5 lakh per annum
   - Above 5 Lakh

2. **Family members and age groups:**

Age group	No. of people
0-10	
10-20	
20-30	
30-40	
40-50	
50-60	
60 or above	

3. When this house was painted last?

a. Six Months ago
b. 1 year ago
c. 2 year ago
d. more than 2 years

How often do you paint your house?

.....

4. Which type of paint do you use?

a. Distemper (Cement Paint)
b. Emulsion (Water based)
c. Enamel (Oil based)

5. Is there any specific brand that you prefer?

a. Yes b. No

If yes, Why (state the reason)?

.....

6. Do you buy the paint yourself?

a. Yes b. No (Skip question 7)

7. Do you look at the label on the can for information about its constituents?

a. Yes b. No

If yes, what kind of information do you look for (Explain)?

.....

8. Are you aware that Lead (a known heavy metal) is used in paints?

a. Yes b. No

If yes, how did you come to know about it (explain)?

.....

9. Have you ever been informed by the vendor about lead containing paint?

a. Yes **b. No**

If yes, state what were you told about?

……

10. Now that you are aware would you prefer to buy lead free paint even if it is a little expensive?

a. Yes **b. No**

Note: We also intend to know if the respondents who are aware about Lead being present in the paint still buy because it is cheaper.

ANNEX 2: Lead in Paints Dealer Survey

Objective: The objective of this survey is to check the awareness of the dealers about the Lead in Paint Regulations and to get a sense of the market of Lead free paints.

Date:

Profile of the Respondent

Name and Address	
Phone number:	
E-mail address:	

1. **Which type of paint do you sell?**
   a. Distemper (Cement Paint)
   b. Emulsion (Water based)
   c. Enamel (Oil based)

2. **What are the brands that you sell?**

   .....

   .....

3. **What all brands are mostly demanded by the customers?**

   .....

   .....

4. **Is there any reason for high demand of these brands?**

   .....

   .....

5. **Are aware that Lead (a known heavy metal) is used in paints?**

   a. Yes b. No

   If yes, how did you come to know about it (explain)?

   .....

   .....

6. **Do you know about "Regulation on Lead contents in Household and Decorative Paints Rules, 2016" by Government of India prohibiting the use of lead in paints?**

   a. Yes b. No

7. **Are you aware that you cannot sell lead containing paint after November 2019?**

   a. Yes b. No

8. **What are the differences between lead containing and lead free paints?**

Name of the Product	Manufacturing date	Lead containing/ lead free/No label/No information	Cost		Availability
			Before Regulation	After Regulation	

9. **Has there been a demand of lead free paints in last one year?**

   a. Yes b. No

   If yes, has it increased or decreased in the last one year?

   .....

   .....

What do you think is the reason for this increase/decrease?

……

……

10. Do you inform about the customers about lead content in certain paint?

a. Yes b. No

11. Has there been any initiative by the manufacturer/supplier to promote lead free paint in recent times or did they provide you with any information (eg: leaflet, brochure etc.) on the lead containing/lead free paints?

……

……

Note: Kindly collect vendor's visiting cards/brochures or other relevant documents.

ANNEX 3: Research Methodology for Lead in Paints Surveys

Research Design:

Quantitative research design will be used for the research to ascertain the awareness level of consumer and wholesaler on Lead content in household and decorative paints and also about the Lead in Paints regulation 2016. The study will follow **Descriptive Research design** to study the awareness of consumers and wholesaler.

Universe and Sample:

The study will be conducted in 8 states of India Rajasthan (Dausa), Uttar Pradesh (Noida/ Ghaziabad), Delhi, Haryana (Faridabad, Bahadurgarh), Manipur, Andhra Pradesh, Jharkhand and Gujarat. The rationale for choosing these states were based on number of existing NGOs partners of Toxics Link. Out of these states depending on the area where these NGOs are working the sites/locality will be chosen for the research and entire area. The Universes will be selected using Purposive Sampling which shall comprises the all the villages where the NGOs are currently working and out of that 200 Respondent (25 respondents from each sites would be selected using the Purposive Sampling Method) 25 respondent would consists 20 consumers and 5 wholesaler from each site) for selecting samples from each site **Simple random sampling** method will be used.

Name of Site/ village*	Rajasthan (Dausa), Uttar Pradesh (Noida/Ghaziabad), Delhi, Haryana (Faridabad, Bahadurgarh), Manipur, Andhra Pradesh, Jharkhand and Gujarat
Name of Village/ universe	The universe for the research would consists of the these villages or City (Dausa), (Noida/Ghaziabad), Faridabad, Bahadurgarh, etc.
Total Sample Size	**200** Respondent Total Out of 200 respondent (20 consumers would be from each sites and 5 wholesaler/ shops from each site)
Sample Size for Consumer	160 Total (20 respondent from each sites)
Sample Size for Wholesaler	40 (5 Wholesaler from each site)
Sampling Method use for selecting sites	Purposive Sampling
Sampling Method use for selecting respondents	Simple Random Sampling

Rational for choosing the villages	The rationale for choosing these states were based on number of existing NGOs partners of Toxics Link. Out of these states depending on the area where these NGOs are working the sites/locality will be chosen for the research. Secondly these sites are selected keeping Mixed population in mind (This would consist from Urban/Rural areas and rural urban fringe in the sample.

Note: For the purpose of the research Village/City etc. are labeled as Site in the research

Methods of data Collection:

Primary methods of data collection includes **Semi-Structure Interview schedule** was used to ascertain the awareness level of consumer on Lead free paints, awareness programme to educate them about lead containing products and the factors which affect their preference for buying lead free or lead containing products. Also a separate **Semi-Structure Interview schedule** will be used to assess the awareness level of wholesaler on lead free products and regulation on Lead content in household and decorative paints 2016.

Apart of primary sources secondary sources of data collection which will uncover the compliance or regulation on Lead content in household paint 2016 will be used in the research.

Method for analyzing data:

SPSS and statistical package will be used in order to analyze the quantitative data and Content analysis will be used to analyze the Qualitative Data. The qualitative data will be coded based on the broad themes and subthemes of the research and a code book will be developed to analyse the qualitative.

The following steps were undertaken for the survey:

1) **Consumer Survey**
   i. Each State/district was divided in four areas/residential localities on the basis of socio economic background.
   ii. In each area a survey of 5 consumers was conducted.
   iii. The conversations were recorded.
   iv. Posters were disseminated and the consumers were explained about the health hazards caused by the presence of lead in household paints.

2) **Dealer Survey**
   i. Two or more markets were located in each State/district.
   ii. Five different shops selling household paints were surveyed.

iii. Both established brands and local brands being sold in the identified markets.

iv. Posters were disseminated and the consumers were explained about the health hazards caused by the presence of lead in household paints.

v. They were educated on the importance of sharing this information with the consumers.

ANNEX 4: List of POs

1) For the Sampling:

- Centre for Innovation in Science and Social Action, Kerala
- Gramin Vikas Evam Paryavaran Sanstha, Dausa, Rajasthan
- Guide Foundation for Development, Andhra Pradesh
- Institute of Social Research and Development, Manipur
- Lok Kalyan Seva Kendra, Jharkhand
- Paryavaran Vikas Kendra, Gujarat
- Prithvi Innovations, Lucknow

2) For the Survey:

- Gramin Vikas Evam Paryavaran Sanstha, Dausa, Rajasthan
- Guide Foundation for Development, Andhra Pradesh
- Institute of Social Research and Development, Manipur
- Lok Kalyan Seva Kendra, Jharkhand
- Paryavaran Vikas Kendra, Gujarat

Note: Survey in Delhi, Uttar Pradesh and Haryana was conducted by Toxics Link Team

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