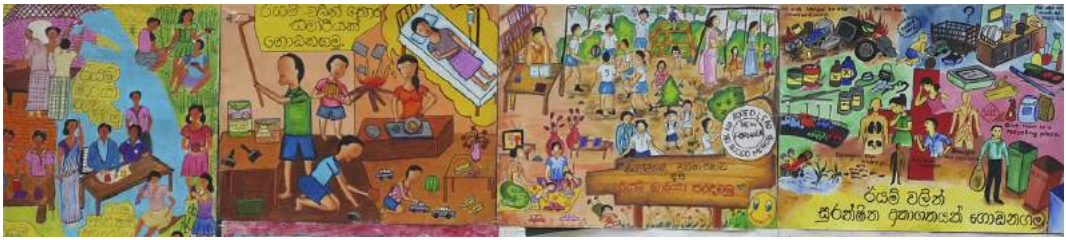

National Report-2015

LEAD IN NEW HOUSEHOLD ENAMEL PAINTS IN SRI LANKA

Eranda Rathnamalala
Dr. Sara Brosché
Valerie Denney

CEJ Centre for Environmental Justice

European Union

IPEN a toxics-free future

Centre for Environmental Justice - is a public interest environmental organisation based in Sri Lanka working towards environmental justice and good Governance.

IPEN- is currently comprised of 700 participating organizations in 116 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.

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June 2015

Produced as part of the Asian Lead Paint Elimination Project Supported by the SWITCH Asia Program of European Union

Disclaimer

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FOREWORD

Lead is a toxic metal harmful to humans and other life forms. Leaded ingredients have been used in gasoline and in paint industry over several decades around the world. Leaded gasoline was banned in Sri Lanka in 2003. However, there were no mandatory lead standard in Sri Lanka until it was gazetted in 2011, as a result of a case filed by the Centre for Environmental Justice. This report was produced as a part of the Asian Lead Paint Elimination Project, which began in 2012. The Asian Lead Paint Elimination Project was established to eliminate lead in paint and raise widespread awareness among business entrepreneurs and consumers about the adverse human health impacts of lead-based household enamel paints, particularly on the health of children under six years old.

The Asian Lead Paint Elimination Project is being implemented by IPEN over a period of three years in seven countries (Bangladesh, India, Indonesia, Nepal, Philippines, Sri Lanka, and Thailand) with funding from the European Union (EU) totaling 1.4 million Euros. Centre for Environmental Justice implement the project in Sri Lanka.

Centre for Environmental Justice is a leading Environmental organization in Sri Lanka working towards the Environmental Justice for all in Sri Lanka who are suffering from environmental problems. CEJ took on the challenge of eliminating lead in paint in Sri Lanka in 2009 We are pleased that this new study shows that all major brands and most new paints produced since January 2013 are within the legal limits.

We thank IPEN for assisting us in this serious task. I thank Dr. Sara Brosché, Ms.Valerie Denney, for their guidance through out this research. I also thank Ms. Chalani Rubasinghe and Mr. Eranda Rathnamalala for their effort to make this research successful.

We thank IPEN for assisting us in this serious task. We also thank paint manufacturers for taking this task seriously and producing lead safe paint for the Sri Lankan market.

Hemantha Withanage
Executive Director
Centre for Environmental Justice

5th June 2015

PREFACE

Leaded paints for home use continue to be widely produced, sold, and used in developing countries despite the fact that most highly industrial countries banned leaded house paints more than 40 years ago.

In 2007 and 2008, NGOs in the IPEN network collected and analyzed decorative (home use) paints on the market in 11 developing countries, and in countries with economies in transition. The results were startling. In every one of these countries, many of the paints had dangerously high lead content. In response, IPEN launched a worldwide lead paint elimination campaign. Since then, IPEN-affiliated NGOs and others have sampled and analyzed paints on the market in approximately 40 low- and middle-income countries.[1] In every country where there was no law or regulation prohibiting, the paints had high, and often dangerously high, lead contents.

This 2015 National Report on Lead Paint presents new data on the lead content of decorative enamel paints that are offered for sale in the Sri Lankan market. This is the third time that Centre for Environmental Justice has analyzed paints sold in Sri Lanka for their lead content.

A previous study, conducted in 2013 (94 enamel paints from 57 brands), found that 47 of the 94 (50%) analyzed paints had lead levels within the legal limit in Sri Lanka (less than 600 parts per million, dry weight of the paint) but that lead concentrations in 47 of the 94 (50%) paints were above 600 ppm. A quarter (24 of 94 paints) analyzed had dangerously high levels of lead (above 10 000 ppm, dry weight) and the highest concentration detected was 131 000 ppm.

In addition to new data on lead in paint, this new report also presents background information on why the present and former use of decorative enamel paints with high lead content is a source of serious concern, especially to children's health. It also proposes action steps by different stakeholders to protect children and others from lead paint and lead dust.

1. *Information about the indicated countries and studies can be found at www.ipen.org.*

EXECUTIVE SUMMARY

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. Lead is also transferred through breast milk when lead is present in a nursing mother.

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?

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 child-occupied facilities—beginning in the 1970s and 1980s.

Based on the results of 2009 analysis of paints in Sri Lanka, CEJ went to the Supreme Court requesting a mandatory standard for protecting the health of children from lead in Sri Lanka (Case no. 64/2011). In response, the consumer affairs Authority made a gazette notification (Gazette Extra Ordinary No. 1725/30 on 30th September 2011) establishing a new mandatory standard for the lead levels in paint to take effect on 01st of January 2013. This standard limits the allowed lead content of enamel paint to a maximum of 600 parts per million (ppm) of the dry weight of the paint.

Late in 2013, CEJ also suggested that paints, varnishes, driers and pigments be added to the controlled items list of the Department of Customs (Imports and Exports control) in order to limit imports of paint ingredients with high lead content -- an important step in assisting small and medium sized paint manufacturers in the elimination of lead in paint. After CEJ published its 2014 "National Report on Lead in Household Dust in Sri Lanka", the Consumer Affairs Authority published another gazette on the label standards with the statement "The Consumer Affairs Authority Directs all manufacturers and traders of paints used in the building industry that they shall print legibly the total content of Lead in paint in mg/ kg on the packs of containers of paints..." (Gazette Extra Ordinary No 1875/38 on 15th of August 2014, to take effect from September 1st, 2014).

In 2014-15, Centre for Environmental Justice purchased a total of 56 cans of solvent-based enamel decorative paint from stores in Colombo, Kandy, Galle, Matara, Kurunegala Anuradhapura, Jaffna, Kalutara, Ampara, Vavuniya, Puttalam, Tambutthegama, Mahawa, Rathnapura, Pelmadulla, Kahawatta, Weli Oya and Wellavaya in Sri Lanka. The paints were from 37 of paint brands. The paints were selected because 1) they were shown to contain lead above 90 ppm in CEJ's 2013 National Report on Lead Paint in Sri Lanka or 2) because they had not previously been analyzed for their total lead content. Paints shown to have a lead content below 90 ppm in earlier studies were not included in this study. All paints were analyzed by an accredited laboratory in Europe for their total lead content, based on dry weight of the paint. This is the third study Centre for Environmental Justice released on the lead content of new decorative enamel paints in Sri Lanka.

The paint study was undertaken as a part of the Asian Lead Paint Elimination Project. The Asian Lead Paint Elimination Project carries out focused activities to eliminate lead paint from the market in seven project countries – Bangladesh, India, Indonesia, Nepal, Philippines, Sri Lanka, and Thailand.

Findings

The current study shows that the lead content in 43% (24 out of 56) of analyzed paints was below 90 ppm, a lead paint standard adopted by most industrialized countries several decades ago and the lowest standard in the world. Moreover, the lead content in 54% (30 out of 56) of analyzed paints was below the Sri Lankan mandatory level of 600 ppm. However, paints with high lead concentrations can still be found in the market in violation of the legal requirements, which were put in place more than two years ago. The highest lead concentration found was 44,000 ppm. Samples from twenty- six out of fifty-six paints (46% of paints) had lead levels higher than 600 ppm and 12 paints had lead concentrations of more than 10,000 ppm.

It was also found that label standards recommended by the recent gazette to include the content of lead in the paint were not followed. Some paint cans even lacked the date of manufacture as required.

Conclusions

Most major paint manufacturers are producing paints with lead content according to the specifications published by Consumer Affairs Authority (CAA). However some paint manufacturers still produce enamel paints with high lead concentrations for the market in violation of regulations. Unfortunately, these leaded paints are manufactured by both some small and medium manufacturers as well as major, more well known manufacturers.

Recommendations

There are two regulations relating to lead content of paint enacted by Consumer Affairs Authority in Sri Lanka that regulate the paint industry. According to the mandatory standards published on the gazette notification 1725/30, the maximum lead level in enamel paints should not be more than 600 ppm. Gazette No 1875/38 dated 15th August 2014 published by the CAA requires legibly printing the lead concentration of the product so that customers can identify which paints have high lead concentrations. This report finds that many manufacturers violate one or both of these regulations.

Regular monitoring of paint market is the best mitigatory action to remove the leaded paints from the market. It requires proper enforcement of the regulation by the Consumer Affairs Authority. Public awareness is very important to protect the consumers. Health and environmental authorities and the civil society organization have to play this role vigorously to protect our children from lead poisoning. Third party certification is the long-term solution to ensure removal of lead from paints.

1. BACKGROUND

1.1 Health and Economic Impact of Lead Exposure

Children are exposed to lead from paint when deteriorating paint on walls, windows, doors, or other painted surfaces begins to chip or deteriorate and lead is released to dust and soil. When a surface previously painted with lead paint is sanded or scraped in preparation for repainting, very large amounts of lead-contaminated dusts also are produced and spread and can constitute a severe health hazard.[1]

Children playing indoors or outdoors get house dust or soil on their hands, and then ingest it through normal hand-to-mouth behavior. If the house dust or the soil is contaminated with lead, the children ingest lead. Hand-to-mouth behavior is especially prevalent in children aged six years and under, the age group most easily harmed by exposure to lead. A typical one- to six-year-old child ingests between 100 and 400 milligrams of house dust and soil each day. [2]

In some cases, children pick up paint chips and put them directly into their mouths. This can be especially harmful because the lead content of chips is typically much higher than what is found in dust and soils. When toys, household furniture, or other articles are painted with lead paint, children may chew on them and directly ingest the lead-contaminated, dried paint. Nonetheless, the most common way that children ingest lead is through lead-contaminated dust and soil that gets onto their hands.[3]

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.[4] The younger the child, the more harmful lead can be, and children with nutritional deficiencies absorb ingested lead at an increased rate.[5] The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child.[6] Lead is also transferred through breast milk when lead is present in a nursing mother.[7]

Once lead enters a child's body through ingestion, inhalation, or across the placenta, it has the potential to damage a number of biological systems and pathways. The primary target is the central nervous system and the brain, but lead can also affect the blood system, the kidneys, and the skeleton.[8]

It is generally agreed that one key element in lead toxicity is its capacity to replace calcium in neurotransmitter systems, proteins, and bone structure, altering function and structure and thereby leading to severe health impacts. Lead is also known to affect and damage cell structure.[9]

According to the World Health Organization (WHO): "Lead has no essential role in the human body, and lead poisoning accounts for about 0.6% of the global burden of disease." Evidence of reduced intelligence caused by childhood exposure to lead has led WHO to list "lead-caused mental retardation" as a recognized disease.[10] WHO also lists it as one of the top ten diseases whose health burden among children is due to modifiable environmental factors.[11]

In recent years, medical researchers have been documenting significant health impacts in children from lower and lower levels of lead exposure.[12, 13] According to WHO: "There is no known safe level of exposure to lead."[14]

When a young child is exposed to lead, the harm to her or his nervous system makes it more likely that the child will have difficulties in school and engage in impulsive and violent behavior.[15] Lead exposure in young children is also linked to increased rates of hyperactivity, inattentiveness, failure to graduate from high school, conduct disorder, juvenile delinquency, drug use, and incarceration.[16] Lead exposure impacts on children continue throughout life and have a long-term impact on a child's work performance, and—on average—are related to decreased economic success.

A recent 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 dollars[2] per year.[17] The study considered the neurodevelopmental effects on lead-exposed children, as measured by reduced IQ points, and it correlated lead exposure-related reductions in children's IQ scores to reductions in lifetime economic productivity, as expressed in lifelong earning power. The study identified many different sources of lead exposure in children, with lead paint as one major source. Broken down by region, the economic burden of childhood lead exposure as estimated by this study was:

- Africa: $134.7 billion of economic loss, or 4.03% of Gross Domestic Product (GDP)
- Latin America and the Caribbean: $142.3 billion of economic loss, or 2.04% of GDP
- Asia: $699.9 billion of economic loss, or 1.88% of GDP

---

2. *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. The data from the table (at: http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD) was accessed by the report's authors in February 2012.*

1.2 The Use of Lead in Paint

Lead is a toxic metal that is found in some paints. Paints contain lead when the paint manufacturer intentionally adds one or more leaded compounds to the paint for some purpose. A paint product may also contain some amount of lead when paint ingredients contaminated with lead are used, or when there is cross-contamination from other product lines in the same factory. Water-based paints are rarely contaminated with lead, but solvent-based enamel paints have been found to have high lead content in many countries.[18]

The leaded compounds most commonly added to paints are pigments. Pigments are used to give the paint its color, make the paint opaque (so it covers well), and protect the paint and the underlying surface from degradation caused by exposure to sunlight. Lead-based pigments are sometimes used alone, and sometimes used in combination with other pigments.

Leaded compounds also may be added to enamel paints for use as driers (sometimes called drying agents or catalysts). Leaded compounds are also sometimes added to paints used on metal surfaces to inhibit rust or corrosion. The most common of these is lead tetroxide, sometimes called red lead or minium.

Non-leaded pigments, driers, and anti-corrosive agents have been widely available for decades, and are used by manufacturers producing the highest quality paints. When a paint manufacturer does not intentionally add lead compounds in the formulation of its paints, and takes care to avoid the use of paint ingredients that are contaminated with lead, the lead content of the paint will be very low –less than 90 parts per million (ppm) total lead by dry weight and frequently down to 10 ppm or less.

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 child-occupied facilities—beginning in the 1970s and 1980s. Many also imposed controls on the lead content of paints used on toys and for other applications likely to contribute to lead exposure in children. These regulatory actions were taken based on scientific and medical findings that lead paint is a major source of lead exposure in children, and that lead exposure in children causes serious harm, especially to children aged six years and under.

The use of lead in production of decorative paint is prohibited in the European Union through regulations related to safety of consumer products and specific prohibitions for most leaded raw materials. In the U.S., Canada, Australia and other countries with regulations restricting the use of leaded ingredients in decorative paint, standards specifying a maximum lead limit are in place. The current standard for household paints in the U.S. and Canada is 90 ppm, and adherence to this ensures that a manufacturer can sell its paint anywhere in the world. Some other countries have established standards of 600 ppm.

1.3 Paint Market and Regulatory Framework in Sri Lanka

There are over 70 paint producers in Sri Lanka, but, six major players control 97% of the market. Nearly all paint manufacturers (99%) depended on imported raw materials from China and Europe .[19]

The six major companies that dominates the paint market are ICI (Dulux/Glidden), Lankem (Robbialac/Rolac), Asian Paints (Royale/Apicolite/Permoglaze), Causway (Luxury/Kenlux), Silicon Coatings (Nippolac/Veron), and Macksons Lanka (Multilac/Micron). Over 50 Small and Medium Enterprises (SMEs) also produce a significant amount of paint locally in all parts of the country on regional basis.

The size of Sri Lankan paint market is, Rs. 15 billion in value and 30-35 million liters in volume per annum. Decorative and industrial paint segments contribute 85% and 15%, respectively, to the total volume. Seasonal sales turn up on December & March when Paint volumes double, compared to an average month.

Lead Paint Regulatory Framework

CEJ played a leadership role in pushing the government to implement and enact mandatory standards for the paint industry since it demonstrated that high lead levels were common in the paints sold in Sri Lankan. As a resut of CEJ's lawsuit, the Consumer Affairs Authority made a gazette notification (Gazette Extra Ordinary No. 1725/30 on 30th September 2011) establishing new mandatory standards for lead levels in paint to take effect on January 2013. Maximum lead level were set at 600 ppm in enamel paints,while some paints used by children and toys were limited to 90 ppm.

CAA also published new labeling requirements on government gazette No 1875/38 in 15 August 2014, which required decorative paint manufacturers and traders to legibly print the total lead content in each container or pack by September 2014, while specifying regulatory limits for different types of paints. The established maximum permissible levels of total lead for different paint categories are as follows;

Paints for Toys and Accessories for Children (Soluble in HCl acid)	- 90 mg/kg
Enamel Paints	- 600 mg/kg
Emulsion Paints for Exterior use	- 90 mg/kg
Emulsion Paints for Interior use	- 90 mg/kg
Floor Paints	- 600 mg/kg

1 mg/kg corresponds to 1 part per million (ppm)

2. MATERIALS AND METHOD

Between August 2014 and February 2015, Centre for Environmental Justice purchased 56 cans of enamel decorative paints from various stores in Colombo, Kandy Matara, Galle Batticaloa, Jaffna and Anuradhapura, Kalutara, Ampara, Vavuniya, Puttalam, Rathnapura and Monaragala districts in Sri Lanka. These paints were from 37 different brands produced by 33 manufacturers operating in Sri Lanka. The paints were selected because 1) they were shown to contain lead above 90 ppm in CEJ's 2013National Report on Lead Paint in Sri Lanka or 2) because they had not previously been analyzed for their total lead content. Paints shown to have a lead content below 90 ppm in earlier studies were not included in this study. Unless some of the paints from the brand were shown to contain lead below 90 ppm in 2013, one white paint and several bright-colored (red, green or yellow) paints were purchased from each brand. The availability of these paints in retail establishments suggested that they were intended to be use within home environments. Excluded were automotive and industrial paints that are not typically used for domestic housing applications or for painting toys. However, four of the paints were anticorrosive paints commonly used in home environments.

Plate 01: Painting Wooden strips

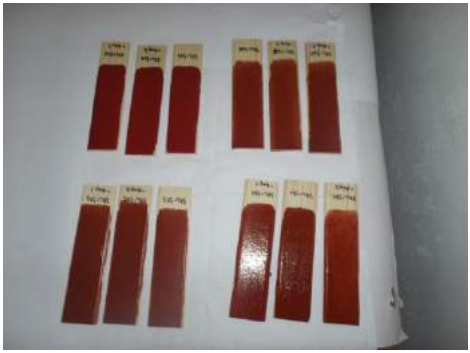

Plate 02: Painted wooden strips

During the paint sample preparation, information such as color, brand, country where manufactured, purchase details, date manufactured as provided on the label of the paint cans 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." Colors were recorded as provided on the can. For the red and yellow paints the protocol called for obtaining "bright" or "strong" red and yellow paints when available. Dates of purchase were recorded in the day/ month/year format in most cases.

Plate 03: Painted wooden strips with paint cans

Plate 04: Packed samples after dried

Paint sampling preparation kits containing individually numbered, untreated wood pieces, single-use paintbrushes and stirring utensils made from untreated wood sticks were assembled and shipped to the CEJ by the staff of the IPEN partner NGO, Arnika, in the Czech Republic.

Each can of paint was thoroughly stirred and was subsequently applied onto individually numbered triplicates of untreated wood pieces using different unused single-use paintbrushes by the staff of CEJ.

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 painted wood pieces were placed in individual re-sealable plastic bags and shipped to a laboratory in Europe that participated in ELPAT (Environmental Lead Proficiency Analytical Testing) program for analysis of total lead content of dry weight of the paint. 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. [20,21]

3. PAINT STUDY RESULTS

A total of 56 cans of new enamel decorative paints purchased in Sri Lanka were analyzed for their lead content. Results are given in parts per million (ppm) lead, based on dry weight of the paint. Please see Appendix A for details of the results.

Since CEJ began studying the lead content of paints sold in Sri Lanka in 2009, most paint brands with the largest market share have reduced lead content to less than 600 ppm. Brands representing over 50% of total market share now sell paint with a lead content below 90 ppm and would meet the most stringent regulation anywhere in the world (*Table 3.1*). This demonstrates that paint with low lead content can be produced cost-effectively in Sri Lanka, and that companies are willing and able to make the shift.

Brand	Color and lead content of paint (ppm) in 2009		Color and lead content of paint (ppm) in 2013		Color and lead content of paint (ppm) in 2015	
A	Sylven Green	55,237	Green	53,000	Bright green	155
	White	3,296	White	24	-	
	Antique Brown	5,137	White	< 9	-	
	Sunrise	137,325	-	-	-	
	Post office Red	7,432	-	-	-	
	Oxford Blue	21,115		-	-	
B	Dark Green	20,904	-	-	-	-
	-	-	White	64		
	Golden Yellow	133,463	Yellow	67	-	
	Oxford Blue	4,163	-	-	-	
	Black	8,851	-	-	-	
	Jasmine Yellow	32,254	-	-	-	
	Post office Red	3,772	-	-	-	
C	Saffron (Lo)	3	Red	53	-	-
	Poppy	4	-	-	-	
	Black	8	-	-	-	
	White	9	-	-	-	
	Regeta Blue	8	-	-	-	

D	-	-	Red	131,000	Poppy	18
			White	27	-	-
E	-	-	Silver	57	-	-
	-	-	Yellow	330	Golden yellow	5
	-	-	Yellow	470	Yellow	5
F	-	-	White	59		
	-	-	Red	230	Post Office Red	26

Table 3.1: The progress in reduction of Lead content in brands produced by paint manufacturers that control approximately 90% of the paint market share in Sri Lanka

A majority of samples analyzed in 2015 conform to Sri Lanka's mandatory standard and a significant number of paints analyzed could be sold anywhere in the world.

Samples from twenty-four out of the 56 enamel paints (43% of paints) contained lead at levels below 90 ppm, a lead paint standard adopted by most industrialized countries several decade ago and the lowest standard in the world. (*Figure 3.1*) "This is a very positive result in Sri Lanka after enacting the mandatory regulations for the paint industry. Thirty paints out of 56 (54%) of the paints are within the regulated lead level of 600 ppm showing that enamel paints within the standard can be produced in Sri Lanka."

Unfortunately, high lead levels above 10,000 ppm were found in samples from 12 (21%) of the paints. The maximum lead concentration recorded was 44,000 ppm in a green colour sample.

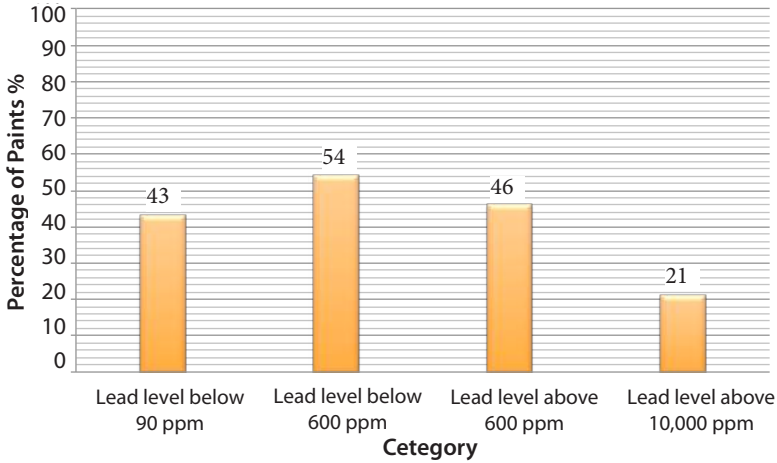

Figure 3.1: Distribution of lead levels in all the analyzed paints in 2015

A majority of paint manufacturers have complied with the mandatory regulation.

All the 56 paints analyzed in 2015 were produced by 33 paint manufactures. All paints from 15 out of 33 manufacturers contained lead levels below 600 ppm. Eight additional manufacturers produced paints with lead levels both below and above 600 ppm, which means they have the ability to produce paints below 600 ppm. All paints from ten manufacturers contained lead above 600 ppm (*Figure 3.2*). Most of the paints with lead levels below 600 ppm contained lead concentrations below 90 ppm.

Half of the paints (13 out of 26) recorded with the lead concentration exceeding 600 ppm were either lacking the date of manufacture or produced before 2013 (*Table A.1*). The remaining 13 out of 26 were produced in and after 2013, when the regulation for maximum lead content was in force.

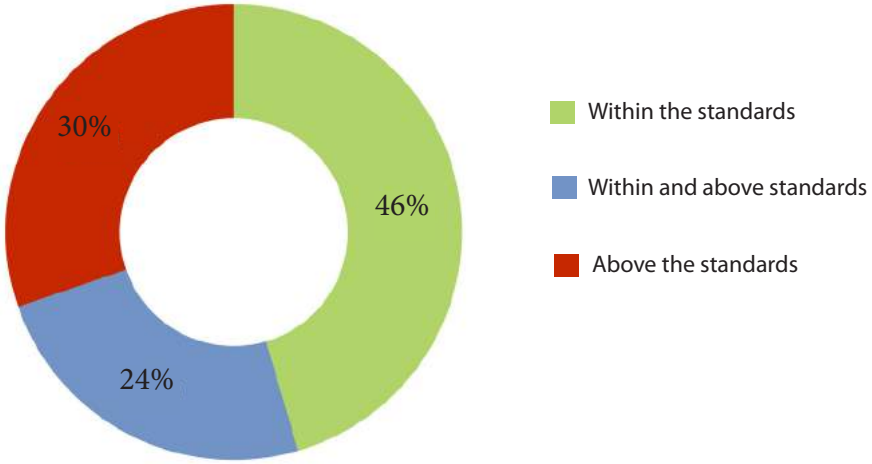

Figure 3.2: Percentage of paint manufacturers producing paints complying or not complying to the 600 ppm legal standard in Sri Lanka. Green color represent percent of manufacturers where all paints in the study contain lead below 600 ppm lead; blue color percent of manufacturers where some of the paints contain lead below and some paints above 600 ppm; red color percent of manufacturers where all paints contained lead above the 600 ppm standard.

The percentage of paints complying with the Sri Lankan legal standard (600 ppm) has increased since 2013. In addition, the percentage of paints with a lead content below 90 ppm has also increased (*Figure 3.3*).

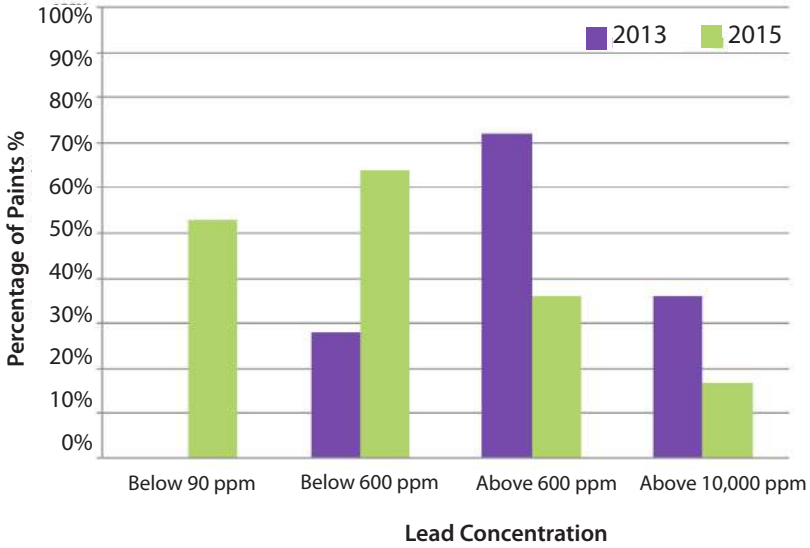

Figure 3.3: Lead content of the 36 paints included in both the 2013 and the 2015 study grouped into concentration categories. Purple bars show lead concentrations in 2013; Green bars show lead concentrations in 2015[3]

Some of the small and medium paint manufacturers that attended discussions and awareness sessions conducted by the CEJ have shown a tremendous improvement in the lead content in their paint (*Table 3.2*). This is the best evidence to prove the ability of any scale manufacturer to convert producing paints within the limits of the Sri Lanka lead standard, and even below 90 ppm as found in 13 out of 16 (81%) paints included in the table.

3. The table includes some paints that contained between 91 and 460 ppm in 2013 but 90 ppm or less in 2015.

Sample# according to the study 2015	Colour	2013 Results (PPM)	2015 Results (PPM)
SRL-251	Oxide red	3,800	5
SRL-252	Red	3,100	258
SRL-253	Brilliant White	91	5
SRL-255	Brilliant White	3,000	25
SRL-257	Brilliant White	460	5
SRL-259	Red	100	5
SRL-261	White	163	16
SRL-262	Saffron	63,000	54
SRL-267	White	3,500	5
SRL-273	Red	3,700	5
SRL-274	Brilliant White	4,000	5
SRL-275	Golden yellow	50,000	530
SRL-276	Yellow	18,000	390
SRL-277	Brilliant white	4,700	5
SRL-281	White	39,000	4
SRL-282	Red	5,700	28

Table3.2 Paints by SMEs that reduced lead levels in their paints to below 600 ppm in 2015 compared to 2013. *The table includes some paints that contained between 91 and 460 ppm in 2013 but 90 ppm or less in 2015.*

Despite some improvement, green and yellow colour paints continue to be the paints most likely to contain high lead levels (*Figure 3.4*).

In 2015, the highest average lead concentration (13,400 ppm) was found in green color paint samples (*Table A.6*). Lead concentration in white paints samples in 2015 were all below 90 ppm except for one sample having a concentration of 520 ppm. Green and yellow colour paints have the highest lead levels, 44,000 ppm and 40,000 ppm respectively. (*Figure 3.4*). The biggest reduction between 2013 and 2015 can be seen in the number of green and yellow samples with lead levels above 10,000 ppm, with a reduction of green paints from three to one and yellow paints from six to three (*Figure 3.5*).

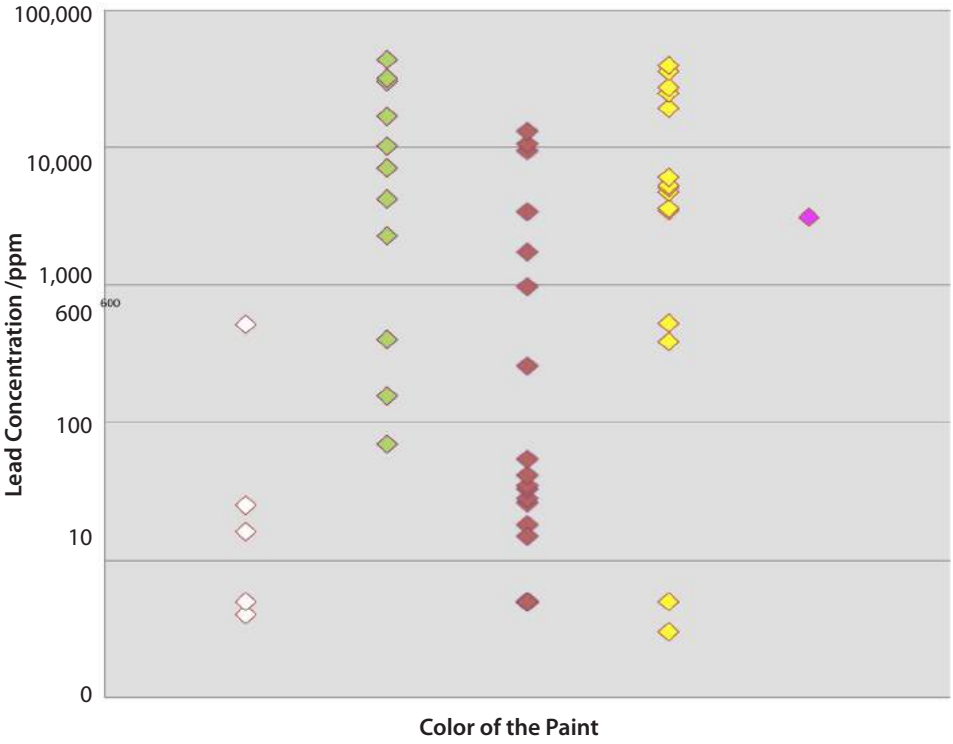

Figure 3.4 Lead concentration of bright colored paints in 2015 .

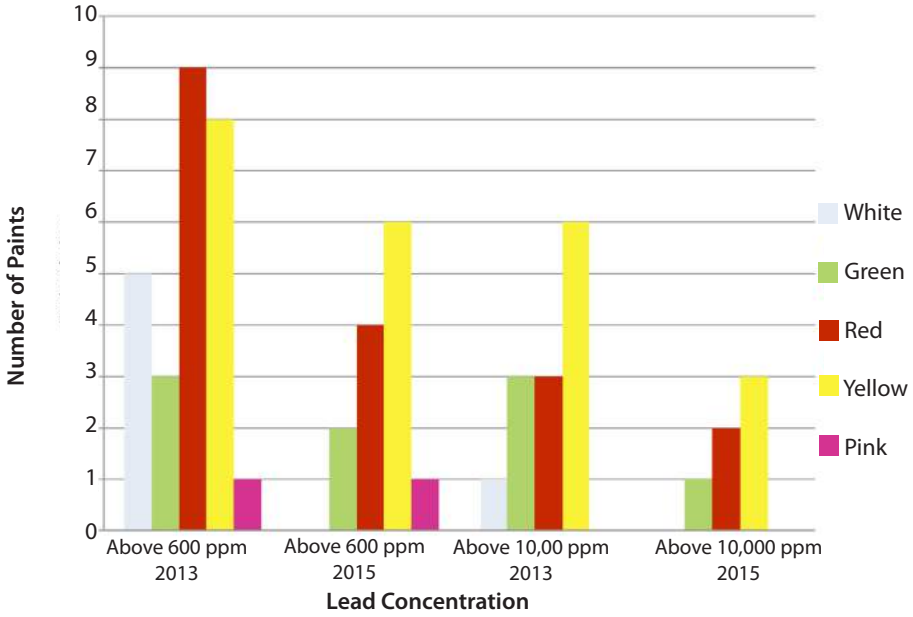

Figure 3.5: Comparison of lead concentration levels in the paints included both in the 2013 and 2015 study

Consumer information required by law is missing or misleading in many cases. For example 13 out of 56 cans were not having the date of manufacture in the lable as required by the label standards.

In addition, some paints with "Lead Safe" labels or advertised as "free from hazardous heavy metals" also exceed legal limits from the market.

4. DISCUSSION & CONCLUSIONS

Since CEJ began investigating lead in decorative paint, the Consumer Affairs Authority enacted regulations on enamel paints by limiting the lead content level to below 600 ppm beginning in January 2013 and regulating paint can labeling in 2014. These actions demonstrate that government officials have become aware of the danger in lead paint poses to young children and the nation's economy and are willing to prevent childhood lead exposure.

Though advocacy by CEJ also has raised awareness of the hazard of lead paint among consumers, it remains virtually impossible for consumers to identify which paints contain unacceptable levels of lead, since most companies don't provide information on their labels and can't be independently verified.

Nevertheless, paint with high lead levels continue to be sold by some of the small and medium paint manufacturers representing approximately 10% of the paint market. CEJ's experience demonstrates that small and medium sized paint manufactures often seek advice when they are informed about the lead standard and the hazards of lead exposure. Some paint manufacturers have expressed their willingness adopt third party certification voluntarily to rectify the paint market towards healthy paint industry in Sri Lanka. Low cost, paint testing facilities and an independent paint certification program can solve this matter permanently in Sri Lanka.

It also would be better if government authorities could assist with the disposal of old, hazardous lead contained paints. Although large scale manufacturers may be able to reclaim their contaminated paints from the market, small scale manufacturers do not have the resources to do so.

RECOMMENDATIONS

The regulatory framework is not sufficient to completely eliminate lead paint in the market without monitoring and evaluation actions. Therefore, third party intervention is important to regularize the paint market. CEJ recommends:

- Mandatory labeling requirements including information about the hazard associated with disturbing surfaces coated with lead paint when preparing for repainting. Self-Labeling of paint containers is not sufficient to identify high quality paints in the market due to complicated non -accredited symbols used by manufacturers (E.g. SRL-272) for their products to get more attraction. Regulations for labeling of paint containers are required to take all the paint manufacturers into a common labeling system.
- A mandatory framework should be established to stop the importation of low quality raw materials for paint manufacturing in Sri Lanka. Around 99% of raw materials are imported from other countries to manufacturing paints in Sri Lanka. But the inspection process for raw materials at the country's access points is not sufficient to avoid poor quality raw materials flowing into the country.
- Some paint companies falsely advertize their product as non-hazardous. A strong monitoring system should be implemented to take remedial action for this type of violation and for misguiding consumers.
- Access to lead in paint analytical facilities for manufacturers at the low cost.
- Implementation of the regulation on Lead in paint should be made through inspection of all factory condition, raw materials and the process as well as paints with regard to lead and other heavy metal concentration in order to ensure the quality production by every branded manufacture.

Paint Industry

Though some Small and Medium scale entrepreneurs in the paint industry are still violating the mandatory regulations enacted by Consumer Affairs Authority (CAA), this could be due to poor knowledge about the paint industry, modern technologies and financial problems.

Therefore, though paint companies should be required to adhere strictly to the law, the government and NGOs should help SMEs learn about: converting their manufacturing process into non leaded paint manufacturing process, how to access to good quality raw materials at low cost, how to access paint testing facilities for an affordable cost and/or certification systems to maintain the paint quality at an affordable cost.

Public Awareness

Decorative paints are widely used in almost all countries in the world. But many people are not aware about the hazards of lead paint. Therefore, public awareness campaign would help people understand this issue and be careful when selecting paints.

APPENDIX A

Table A.1 Solvent-based, Enamel Paints Included in the Study

Sample No.	Paint color	Volume (ml) / Weight (g)	Price (SLR)	Manufacture date or code	Date of Purchased	Company web site
SRL-250	Poppy	200 ml	280.00	16/01/2013	28/10/2014	https://www.asian-paints.com
SRL-251	Oxide red	500 ml	485.00	5/9/2014	9/2/2015	N/A
SRL-252	Red	500 ml	375.00	11/8/2014	10/2/2015	N/A
SRL-253	Brilliant White	500 ml	525.00	10.2014	8/12/2014	N/A
SRL-254	Gold Mine	200ml	255.00	7.2014	8/12/2014	N/A
SRL-255	Brilliant White	200 ml	200.00	Not available	28/10/2014	N/A
SRL-256	Arundel Green	1L	800.00	11.01.2013	1/12/2014	N/A
SRL-257	Brilliant White	200 ml	265.00	18.09.2014	28/10/2014	N/A
SRL-258	Green	100 ml	110.00	25.04.2014	28/10/2014	N/A
SRL-259	Red	500ml	485.00	15.08.2014	1/12/2014	N/A
SRL-260	Golden Yellow	500ml	375.00	3/6/2013	8/12/2014	N/A
SRL-261	White	500 ml	475.00	11.10.2014	19/02/2015	N/A
SRL-262	Saffron	500 ml	475.00	15.07.2014	19/02/2015	N/A
SRL-263	Post Office Red	500ml	540.00	25.11.2013	1/12/2014	http://causeway-paints.com
SRL-264	Golden Yellow	500ml	530.00	No	9/12/2014	N/A
SRL-265	Red	1L	750.00	No	9/12/2014	N/A
SRL-266	White	500ml	405.00	1.2014	1/12/2014	N/A
SRL-267	White	100ml	85.00	8.2014	5/12/2014	N/A
SRL-268	Golden yellow	200 ml	275.00	May-14	2/12/2014	N/A
SRL-269	Yellow	100 ml	120.00	Bx209/09	2/12/2014	N/A
SRL-270	Bright Green	200 ml	270.00	26.02.2014	28/10/2014	www.niponpaint.com.lk
SRL-271	Red	100ml	82.00	05.11.2013	16/12/2014	N/A

SRL-272	Red	01 L	685.00	2/10/2014	31/10/2014	N/A
SRL-273	red	200ml	230.00	2.2013	9/2/2015	N/A
SRL-274	Brilliant White	500 ml	510.00	22/10/2014	1/12/2014	www.royalpaint.com
SRL-275	Golden yellow	200 ml	220.00	17/ 09/ 2013	31/10/2014	www.royalpaint.com
SRL-276	Yellow	100ml	90.00	01.8.2014	11/2/2015	N/A
SRL-277	Brilliant white	500 ml	465.00	10/1/2014	31/10/2014	N/A
SRL-278	Grass Green	01 L	790.00	8/1/2014	31/10/2014	N/A
SRL-279	Yellow	500ml	495.00	1.2014	6/2/2015	N/A
SRL-280	Red	200ml	165.00	7.2014	8/12/2014	N/A
SRL-281	White	200ml	165.00	8.2014	8/12/2014	N/A
SRL-282	Red	200ml	165.00	5.2014	8/12/2014	N/A
SRL-283	Red	500 ml	380.00	No	7/2/2015	N/A
SRL-284	Red	100ml	98.00	21.10.2013	2/12/2014	https://www.asian-paints.com
SRL-285	Red	500ml	475.00	30.09.2014	1/12/2014	N/A
SRL-286	Butter Milk	500ml	395.00	No	9/2/2015	N/A
SRL-287	Butter Milk	500ml	395.00	No	11/2/2015	N/A
SRL-288	Pink	50ml	35.00	No	11/2/2015	N/A
SRL-289	Yellow	100ml	75.00	2012	7/2/2015	N/A
SRL-290	Yellow	200ml	221.00	11.2012	10/2/2015	N/A
SRL-291	Poppy	1l	775.00	No	11/2/2015	N/A
SRL-292	Green	50ml	75.00	2.2013	6/2/2015	www.jatholdings.com
SRL-293	Sylvan Green	200 ml	175.00	No	8/12/2014	N/A
SRL-294	Green	500ml	395.00	30.5.2013	11/2/2015	N/A
SRL-295	Sylvan Green	200ml	78.00	No	8/12/2014	N/A
SRL-296	Golden Yellow	500ml	500.00	22.11.2013	5/12/2014	N/A
SRL-297	Off white	200 ml	199.00	Unavail-able	20/01/2015	N/A
SRL-298	Red	100 ml	120.00	28/12/2014	10/2/2015	N/A

SRL-299	Bright Green	500 ml	525.00	11/9/2014	6/2/2015	N/A
SRL-300	Green	50 ml	45.00	Unavail-able	16/12/2014	N/A
SRL-301	Yellow	100 ml	85.00	1090	7/2/2015	N/A
SRL-302	County Cream	500 ml	275.00	Unavail-able	9/2/2015	N/A
SRL-303	Red	200 ml	210.00	07. 2014	23/01/2015	N/A
SRL-304	White	500 ml	390.00	13/08/2014	1/12/2014	www.royalpaint.com
SRL-305	Green	100 ml	90.00	2011	23/01/2015	N/A

Table A.2 Results of Lab Analysis of the Solvent-based Enamel Paints Included in the Study

Sample No.	Paint color	Lead Conc. (PPM)	Country of Brand head quarters	Country where manufac-tured	Lead content label yes/no
SRL-251	Oxide red	5	Sri Lanka	Sri Lanka	No
SRL-252	Red	258	Sri Lanka	Sri Lanka	No
SRL-253	Briliant White	5	Sri Lanka	Sri Lanka	No.
SRL-254	Gold Mine	27,441	Sri Lanka	Sri Lanka	No
SRL-255	Briliant White	25	Sri Lanka	Sri Lanka	No.
SRL-256	Arundel Green	7,100	Sri Lanka	Sri Lanka	No
SRL-257	Briliant White	5	Sri Lanka	Sri Lanka	No
SRL-258	Green	44,000	Sri Lanka	Sri Lanka	No
SRL-259	Red	5	Sri Lanka	Sri Lanka	Yes
SRL-260	Golden Yellow	36,000	Sri Lanka	Sri Lanka	No
SRL-261	White	16	Sri Lanka	Sri Lanka	No
SRL-262	Saffron	54	Sri Lanka	Sri Lanka	No
SRL-263	Post Office Red	26	Sri Lanka	Sri Lanka	Yes
SRL-264	Golden Yellow	40,000	Sri Lanka	Sri Lanka	No
SRL-265	Red	10,594	Sri Lanka	Sri Lanka	No
SRL-266	White	5	Sri Lanka	Sri Lanka	Yes
SRL-267	White	5	Sri Lanka	Sri Lanka	No
SRL-268	Golden yellow	5	Sri Lanka	Sri Lanka	Yes
SRL-269	Yellow	5	Sri Lanka	Sri Lanka	No
SRL-270	Bright Green	155	Sri Lanka	Sri Lanka	No ,SLS certified
SRL-271	Red	13,258	Sri Lanka	Sri Lanka	No
SRL-272	Red	969	Sri Lanka	Sri Lanka	Yes
SRL-273	red	5	Sri Lanka	Sri Lanka	No
SRL-274	Briliant White	5	Sri Lanka	Sri Lanka	No
SRL-275	Golden yellow	530	Sri Lanka	Sri Lanka	no
SRL-276	Yellow	390	Sri Lanka	Sri Lanka	No
SRL-277	Briliant white	5	Sri Lanka	Sri Lanka	Yes
SRL-278	Grass Green	16,900	Sri Lanka	Sri Lanka	Yes
SRL-279	Yellow	3,600	Sri Lanka	Sri Lanka	No
SRL-280	Red	9,500	Sri Lanka	Sri Lanka	No

SRL-281	White	4	Sri Lanka	Sri Lanka	No
SRL-282	Red	28	Sri Lanka	Sri Lanka	No
SRL-283	Red	1,740	Sri Lanka	Sri Lanka	No
SRL-284	Red	33	Sri Lanka	Sri Lanka	Yes
SRL-285	Red	35	Sri Lanka	Sri Lanka	Yes
SRL-286	Butter Milk	3,500	Sri Lanka	Sri Lanka	No
SRL-287	Butter Milk	4,770	Sri Lanka	Sri Lanka	No
SRL-288	Pink	3,136	Sri Lanka	Sri Lanka	No
SRL-289	Yellow	6,100	Sri Lanka	Sri Lanka	No
SRL-290	Yellow	25,000	Sri Lanka	Sri Lanka	Yes
SRL-291	Poppy	3,400	Sri Lanka	Sri Lanka	No
SRL-292	Green	4,200	Sri Lanka	Sri Lanka	No
SRL-293	Silvan Green	70	Sri Lanka	Sri Lanka	No
SRL-294	Green	30,000	Sri Lanka	Sri Lanka	No
SRL-295	Sylvan Green	10,300	Sri Lanka	Sri Lanka	No
SRL-296	Golden Yellow	3	Sri Lanka	Sri Lanka	No
SRL-297	Off white	5,300	Sri Lanka	Sri Lanka	No
SRL-298	Red	41	Sri Lanka	Sri Lanka	No
SRL-299	Bright Green	32,000	Sri Lanka	Sri Lanka	No
SRL-300	Green	400	Sri Lanka	Sri Lanka	No
SRL-301	Yellow	19,300	Sri Lanka	Sri Lanka	No
SRL-302	County Cream	5,100	Sri Lanka	Sri Lanka	No
SRL-303	Red	15	Sri Lanka	Sri Lanka	No
SRL-304	White	520	Sri Lanka	Sri Lanka	No
SRL-305	Green	2,300	Sri Lanka	Sri Lanka	No

Table A.3 Distribution of Lead Concentration by Brand in 2015

Brands	Number of paints	# of paints above 90 PPM	# of paints above 600 PPM	# of paints above 10,000 PPM	Minimum lead content (PPM)	Maximum lead content (PPM)
A1	1	0	0	0	18	18
B1	1	0	0	0	5	5
B2	3	2	2	1	5	27.441
B3	1	1	0	0	258	258
C1	1	1	1	0	4,770	4,770
C2	1	0	0	0	25	25
C3	3	2	2	1	41	25,000
D1	3	2	2	2	5	44,000
D2	1	0	0	0	33	33
D3	1	0	0	0	5	5
D4	2	2	1	1	400	3,400
E1	1	1	1	1	36,000	36,000
E2	2	2	2	1	3,500	19,300
E3	3	1	1	0	16	5,100
J1	1	1	1	0	4,200	4,200
J2	1	0	0	0	35	35
K1	1	0	0	0	26	26
L1	2	2	2	2	10,594	40,000
L2	1	1	1	0	3,136	3,136
M1	1	0	0	0	70	70
M2	1	0	0	0	5	5
M3	1	1	1	1	10,300	10,300
M4	2	0	0	0	5	215
M5	2	0	0	0	5	5
N1	1	1	0	0	155	155
O1	1	1	1	1	13,258	13,258
P1	1	1	1	0	969	969
R1	1	0	0	0	5	5
R2	3	2	0	0	5	530
S1	1	1	1	0	6,100	6,100
S2	2	2	1	0	390	2,300
S3	2	1	1	1	5	16,900
S4	1	1	1	0	3,600	3,600
S5	3	1	1	0	4	9,500
V1	1	0	0	0	3	3
V2	1	1	1	0	1,740	1,740
V3	1	1	1	1	30,000	30,000

Table A.4 Change in Lead Content from 2013

Brand	Number of Samples	# of paints above 90 ppm		# of paints above 600 ppm		# of paints above 10,000 ppm	
		2013	2015	2013	2015	2013	2015
Asian Paints	1	1	0	1	0	1	0
Bergo	1	1	0	1	0	0	0
Berlux	2	2	2	2	2	0	1
Britex	1	2	1	1	0	0	0
Chemico	1	2	1	2	1	0	0
Citizen	1	1	0		0		0
Colorbrite	1	1	1	1	1	1	0
Decolite	1	1	0	0	0	0	0
Decora	1	1	0	0	0	0	0
Deltex	1	1	0	0	0	0	0
Ecolux	1	1	1	1	1	1	1
Evershine	2	2	0	1	0	1	0
Kenlux	1	1	0	0	0	0	0
Lanka Bride	2	2	2	2	2	1	2
Lanka Pride	1	1	1	1	1	0	0
Micron	1	1	0	0	0	0	0
Multico	1	1	0	1	0	0	0
Multilac	2	2	0	0	0	0	0
Nippolac	1	1	1	1	0	1	0
Orient	1	1	1	0	1	1	1
Prolac	1	1	1	1	1	0	0
Rovex	1	1	0	1	0	0	0
Royal	2	2	1	2	0	1	0
Seimax	1	1	1	1	1	1	0
Silver star	1	1	1	1	0	1	0
Starlac	2	2	1	2	1	1	1
Sunkem	1	1	1	1	1	1	0
Suriyalack	3	3	1	3	1	2	0

Table A. 5 Consumer Information about Lead on Paint Cans

The new paint labeling regulations required mentioning the lead level in the paint container. The paint containers also include various logos giver under various certification programmes operate nationally and internationally. Table below gives the availability of such information on the purchased paint containers for this study.

Paint manufacturer	Number of Samples	Lead content or other lead information on the label (Yes/No)	Independent third party certification of "Lead Safe" Claims? (Yes/No)	Information about lead hazard to children (Yes/No)	Information about lead hazard when painting or remodelling (Yes/No)	Specific language about lead on label
Asian Paints (Lanka)Limited., Sri Lanka	2	Yes	No	No	No	No
Ever Paint & Chemical Industries(Pvt)Ltd.	3	Yes	No	No	No	No
Decolite Paint Company, Sri Lanka	3	No	No	No	No	No
Chemimix(Pvt)Ltd.	1	No	No	No	No	No
Lanka Paint Solutions (Pvt) Ltd., Sri Lanka	2	No	No	No	No	No
Cristal Chemical Industries, Sri Lanka	2	No	No	No	No	No
Silicon coatings (pvt) Ltd.	2	No	No	No	No	SLS Certified
Royal paints Lanka (Ltd.), Sri Lanka	3	No	No	No	No	No
Silver Star	2	No	No	No	No	No
Star Paint Industries., Sri Lanka	2	Yes	No	No	No	No
Globe Colour Coatings	1	No	No	No	No	No
Suriya Chimiques (Pvt) Ltd., Sri Lanka	3	No	No	No	No	No
Venus Chemicals,	1	No	No	No	No	No
Standard Chemical Industries(Pvt)Ltd	2	Yes	No	No	No	No
Olympic Industrial Coatings (Pvt) Ltd.	3	No	No	No	No	No
Seimax Chemical Industries	1	No	No	No	No	No

Chemi Lanka Chemicals	2	No	No	No	No	No
J Chem coating(pvt) Ltd (A subsidery of JAT Holdings (Pvt) Ltd.)	1	No	No	No	No	No
Masons Mixture Limited, Browns Group	1	No	No	No	No	No
N.V.C.Industries(Pvt)Ltd.	1	No	No	No	No	No
Berlux paints (Pvt) Ltd. Sri Lanka	3	No	No	No	No	No
Evershine paint industries	1	No	No	No	No	No
Mayura color paint lanka (Pvt) Ltd.	2	No	No	No	No	No
Peacock Enterprices (PVT) limited., Sri Lanka	1	No	No	No	No	No
Industrial Asphalts (Ceylon) Limited., Sri Lanka	1	No	No	No	No	No
Citizen Paint Company, Sri Lanka	1	No	No	No	No	No
Sarathchandra Chemicals (Pvt) Ltd., Sri Lanka	1	Yes	No	No	No	No
Causeway Paints Lanka(Pvt)Ltd., Sri Lanka	1	Yes	No	No	No	No
Macsons Paints worldwide, (Sri Lanka with ingredients imported from USA, UK Germany)	3	Yes	No	No	No	No
Orient Paint Industries, Sri Lanka	1	No	No	No	No	No
Pro Paint Industries, Sri Lanka	1	Yes	No	No	No	No
Chemitech (pvt)Ltd., Sri Lanka	1	No	No	No	No	No
Eastern Paints(pvt) ltd ., Sri Lanka	1	No	No	No	No	No

Table A.6 Lead Concentration (ppm) by Color.

Colour	Number of paints	Average Conc. (PPM)	# of paints above 90 PPM	# of paints above 600 PPM	# of paints above 10,000 PPM	Minimum lead content (PPM)	Maximum lead content (PPM)
White	10	60	1	0	0	4	520
Green	11	13,400	10	0	5	70	44,000
Red	18	2,200	7	6	2	5	13,258
Yellow	16	11,100	13	11	5	3	40,000
Pink	1	3,136	1	1	0	3,136	3,136

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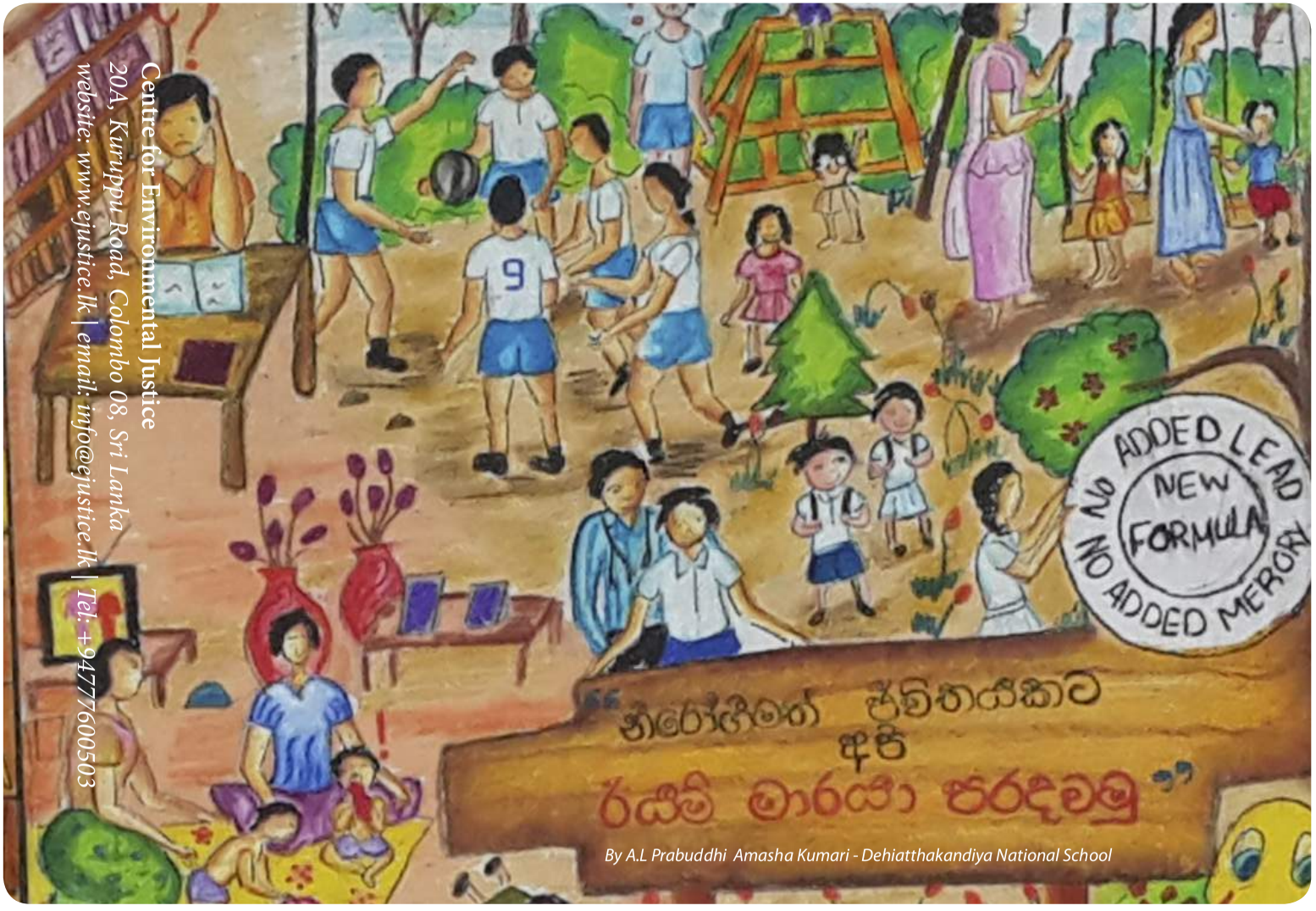

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