Lead Free KIDS for a Healthy Future

NATIONAL REPORT
LEAD IN HOUSEHOLD AND SCHOOL DUST IN NEPAL

CEPHED

Center for Public Health and
Environmental Development (CEPHED)

An Initiative under ongoing EU IPEN Lead Paint Elimination Project

EUROPEAN UNION

IPEN
a toxics-free future

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Center for Public Health and Environmental Development (CEPHED)
Imadol-5, Lalitpur, Kathmandu, Nepal
Phone/Fax: +977-01-5201786
Email: cephed04@yahoo.com

Study Team:
- Ram Charitra Sah, Executive Director, CEPHED, Nepal, cephed04@yahoo.com
- Er. Manish Thapa, Policy and Communication Officer, CEPHED, Nepal,
- Sara Brosche, PhD, IPEN Project Manager, SWITCH AISA, Lead Paint Elimination Project, sarabrosche@ipen.org
- Prof. Scott Clark, PhD Professor Emeritus in Environmental Health, University of Cincinnati, USA, CLARKCS@ucmail.uc.edu
- Valerie Denney, Communication Advisor, SWITCH AISA, Lead Paint Elimination Project, vdenney@valeriedenney.com

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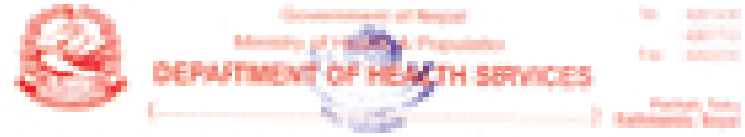

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MESSAGE

Center for Public Health and Environmental Development (CEPHED) under the ongoing project entitled "**Eliminate Lead Paints**" from seven Asian countries including Nepal with the support of IPEN and EUROPEAN UNION has brought this "**National report, Lead in Household and School dust in Nepal**" is an important and positive step. The lead level in household, hospital and school dusts and related environmental and health related information included in this study report has been expected to be very helpful to realize the possible protective measures.

Lead (Pb) is a toxic heavy metals has been widely used in various daily consumable goods and decorative items such as paints for house, furniture and schools, sport items, toys and cosmetics etc. Once lead gets into our bodies through food, water, dust, breast feeding and inhalation, it interacts with different systems, accumulates in blood and bones and hardly removed from the bodies. Lead is toxic in nature and up on exposure to it can cause several diseases to human body. The toxic effects of lead have long been well known, especially as regards acute forms of poisoning. According to World Health Organization (WHO), "lead can damage the nervous, reproductive systems, kidneys, and can cause high blood pressure and anemia. Lead is more harmful to the developing brains of fetuses and young children and to pregnant women than adults and old age people. High blood lead levels in children can cause irreversible and permanent damage including learning disabilities, behavioral changes, and even mental retardation. At very high levels, lead can cause convulsions, coma and death too."

I appreciate and wish CEPHED all the very success to continue its effort and contribution for chemical safety especially lead toxicity, lead paint elimination, formulation of standard, related researches and awareness raising programs in coming days. Finally, I would like to request all concerned to take away the message, conclusion and recommendations made in this report and contribute to the extent possible in building of healthy and prosperous society. Thank you.

Dr. Senendra Raj Upreti
Director General
Department of Health Services
Ministry of Health and Population

सहयात्री संस्था जनस्वास्थ्य तथा वातावरण प्रवर्द्धन केन्द्र (CEPHED) ले लेड (सिसा) विषाक्तता सम्बन्धी महत्वपूर्ण अनुसन्धानहरू गरी जनचेतनामूलक कार्यक्रमहरूका माध्यमबाट बालबालिकाको स्वास्थ्य, शारीरीक, मानसिक तथा बौद्धिक विकासमा पर्ने नकारात्मक असरहरूबाट बचाउन गरेका प्रयासहरूको सराहना गर्दछु ।

जनस्वास्थ्य तथा वातावरण प्रवर्द्धन केन्द्र (CEPHED) ले निरन्तर गर्दै आएको घर, फर्निचर र स्कूल रङ्गाउने रङ्गहरूमा लेड सम्बन्धी अध्यन, हालै सम्पन्न घर तथा स्कूलहरूको धुलोमा लेडको अध्यन, बालबालिकाको खेलौनाहरूमा घातक रसायनहरू सम्बन्धी अध्यन, गन्हुङ्गे घातक रसायनहरूबारेमा स्कूले बालबालिका, अभिभावक, शिक्षकहरू माझ आवश्यक जानकारी, जनचेतना तथा क्षमता अभिबृद्धि लगायत शिक्षा विभाग, निजी तथा आवासिय विद्यालय अर्गानाईजेसनहरूसँग मिलेर लेड विषाक्तताबारे जनचेतना एवं जानकारीमूलक पोष्टरहरूको सह-उत्पादन, प्रचारप्रसार तथा देशभरी वितरण गर्ने कार्यहरूबाट लेड सम्बन्धी स्कूल, कलेज, विद्यार्थी, बालबालिका, शिक्षक, अभिभावक र स्कूल व्यवस्थापन लगायत आमजनतामा व्यापक जनचेतनाको अभिबृद्धि भएको पाएको छु ।

यी सबै कार्यहरूले कालान्तरमा नेपाल सरकार, शिक्षा मन्त्रालय, शिक्षा विभागको बालबालिका तथा विद्यार्थीहरूको सुस्वास्थ्य तथा समग्र विकास गर्ने उदेश्य प्राप्तिमा टेवा पुग्ने विश्वास लिएको छु ।

जनस्वास्थ्य तथा वातावरण प्रवर्द्धन केन्द्र (CEPHED) द्वारा अध्ययन गरी तयार पारिएको यो **घर तथा स्कूलहरूको धुलोमा लेडको अध्यन** सम्बन्धी राष्ट्रिय प्रतिवेदनले सबै अभिभावक, स्कूल प्रशासन, शिक्षक, विद्यार्थी लगायत समग्रमा नेपालको शिक्षा प्रणालीमै आवश्यक सुधारात्मक उपायहरू अबमम्वन गर्न सघाउने कुरामा विस्वस्त छु । यसले लेडको संम्पर्कबाट बालबालिकाहरूमा पर्नसक्ने नकारात्मक असरहरूबाट बचाउन सहयोग मिल्ने छ ।

यस प्रतिवेदनको निष्कर्ष एवं दिईएका सुझावहरूबाट सरकारी निकायहरू र शिक्षण संस्थाहरूलाई लेडमुक्त गराउन महत्वपूर्ण योगदान मिल्न जाने छ । सबै विद्यालयहरूलाई लेडमुक्त गर्न यहाँहरूको सहयोगको अपेक्षा गरेको छु ।

डा. लवदेव अवस्थी
महानिर्देशक
शिक्षा विभाग
सानोठिमी, भक्तपुर

Foreword

This report presents the results from an analysis of lead in dust at 23 locations in Nepal. The locations include residential buildings, government and private schools and hospitals around the Kathmandu Valley. These are locations where children spend a lot of time and might be exposed to high levels of lead through contaminated dust.

This report is the second in a series of three reports on lead in paint in Nepal prepared by Center for Public Health and Environmental Development (CEPHED) as part of the IPEN Asian Lead Elimination Project. The first, *Lead in Nepal's New Enamel Household Paints,* released in 2013, showed that a majority of paint brands for sale in Nepal contained high levels of lead. A third report, due out in 2015, will follow up on the brands found containing high levels of lead in CEPHED's 2013 study to determine whether or not paint manufacturers are beginning to reduce lead levels in their paint. In addition, Center for Public Health and Environmental Development released reports on lead in paint in 2010 and 2011. Findings in CEPHED's reports are consistent with findings in other studies conducted by the Government of Nepal, Nepal Bureau of Standard and Metrology (NBSM) in 2012 and the Non-Governmental Organization, LEADERS Nepal, in 2013 (Gottesfeld, P., et all 2014).

Lead contaminated dust and soil is the major pathway by which lead in paint contributes to childhood lead exposure. *Lead in Household and School Dust in Nepal* presents documented examples of the presence of lead in dust on floors of houses, hospitals and schools, and demonstrates why the use of household paints with high lead content is a source of serious concern, especially for children's health. It also proposes recommendations for taking action to protect children and others from lead in paint.

Lead in Household and School Dust in Nepal was prepared by CEPHED with support and assistance from the Asian Lead Paint Elimination Project. The Asian Lead Paint Elimination Project is a project of IPEN with EUR £1.4 million funding from the European Union. The project is coordinated by IPEN and is being conducted over a three year period in seven countries (Bangladesh, India, Indonesia, Nepal, Philippines, Sri Lanka, and Thailand). Its purpose is to eliminate lead in paint in above mentioned countries and raise widespread

awareness among property owners, painters, paint companies and consumers about the adverse human health impacts of lead-based decorative paints, particularly on the health of children under six years old.

CEPHED is a participating organization in IPEN. It is an environmental NGO established in the year 2004, by and through the contribution and coordination from a group of activist and experienced people from medical, environment and public health sectors. CEPHED's focus is to serve the Nepalese people and communities in the field of public health and environment. CEPHED has adopted the vision of acting as a bridging forum between people and science and technology, to make new scientific knowledge, technology and safety measures of environment and public health sector accessible through research, coordination, capacity building and policy dialogue, etc. It works within Nepal to bring the experience from people and organizations on the ground to the concerned authorities' notice in order to develop meaningful and sustainable solutions. In the past 10 years it has been engaged in research, awareness raising, capacity building, policy influence (especially in the areas of chemical management), pesticides, obsolete pesticides, healthcare waste, persistent organic pollutants (POPs), and heavy metals like mercury, lead and cadmium. With its growing interest and engagement with various environmental issues of national and international importance, it has become an active participating organization in several global networks working in the area of public health, environment and toxic free future. CEPHED is an official contributor of the Global Alliance to Eliminate Lead Paint (GAELP) since 2012, and a member organization of Toxics Link, International POPs Elimination Network (IPEN), The Global Alliance for Incinerator Alternatives (GAIA), Healthcare Without Harm (HCWH), Collaborative on Health and the Environment (CHE), the Zero Mercury Working Group (ZMWG), the World Alliance for Mercury Free Dentistry (WAMFD) and Asian Center for Environmental Health.

IPEN is an international NGO network of health and environmental organizations from all regions of the world. IPEN is a leading global organization working to establish and implement safe chemicals policies and practices to protect human health and the environment. Its mission is a toxics-free future for all. IPEN helps build the capacity of its member organizations to implement on-the-ground activities, learn from each other's work, and work at the international level to set priorities and achieve new policies.

The European Union is made up of 28 Member States who have decided to gradually link together their know-how, resources and destinies. Together, during a period of enlargement of 50 years, they have built a zone of stability, democracy and sustainable development, while maintaining cultural diversity, tolerance and individual freedom. The European Union is committed to sharing its achievements and its values with countries and people beyond its borders.

15 October 2014

Ram Charitra Sah
Executive Director
CEPHED
Nayabasti, Imadol-5, Lalitpur
Kathmandu, Nepal
Tel/Fax: +977-1-5201786
Email: cephed04@yahoo.com

Contents

Introduction

Despite being banned in most industrialized countries decades ago, decorative paints continue to be a major source of lead exposure for young children worldwide including Nepal.

Most highly industrial countries adopted laws or regulations to control the lead content of decorative paints-paints used on the interiors and exteriors of homes, schools, and other child-occupied facilities- often beginning in the 1970s and 1980s and sometimes earlier. Many also imposed controls on the lead content of paints used on toys and 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.

Results in brief

Few countries have regulatory standards limiting the maximum allowable lead level in dust. In the United States, a surface dust lead loading from a floor area in housing or other areas used by children equal to or higher than 40 $\mu g/ft^2$ is defined by the Environmental Protection Agency as a dust-lead hazard. However, this standard is based on the aim of keeping blood lead levels in 95% of the children exposed at or below 15 $\mu g/dl$ (Gaitens, et al., 2009). This level is far higher than the 5 $\mu g/dl$ level that the US CDC uses for identifying children in need of medical monitoring and lead exposure prevention measures.

Scientific studies performed over the last decades show that dust lead loadings as low as 10 $\mu g/ft^2$ can contribute to blood lead levels harmful to the developing brain (see e.g. Lanphear, et al., 1998; Dixon, et al., 2009). In this study, a lead level of 10 $\mu g/ft^2$ was used as a reference point in the analysis of the dust results.

CEPHED collected 79 samples (4 blank samples and 75 dust samples) from 23 locations, which included five schools (1 government school and 4 private boarding schools), two hospital buildings and 16 residential homes. The results of the dust analysis are shown in **Table 1**. Out of 23 locations, 2 locations have

one or more samples containing lead levels exceeding 40$\mu g/ft^2$, ranging from 58 to 108 $\mu g/ft^2$. Both of these locations are school buildings. One or more samples from 11 of the locations contained lead levels 10 $\mu g/ft^2$ and higher (**Figure 1**).

Overall, 52 of 75 (69%) dust samples had lead contamination lower than 10 $\mu g/ft^2$; 23 of 75 (31%) samples had lead contamination higher than 10 $\mu g/ft^2$; 18 of 75 (24%) samples had lead contamination in between 10-39 $\mu g/ft^2$ and 5 of 75 (7%) samples had lead contamination 40 $\mu g/ft^2$ and higher.

Though the number of samples exceeding the U.S. limit of less than 40 µg/ft2 may seem small, the study raises serious concerns about lead levels in schools. Four of the five samples with the highest levels were found at one school [school 5], and one other school [school 4]. Moreover, 12 of the 18 samples with levels between 10 -39 µg/ft2 were also from schools. [3 out of 4 samples from schools 2 and 3; 4 out of 6 samples from school 4; and 2 out of 4 samples from school 1] Immediate action should be taken at all of these schools to further test for lead and immediately institute cleaning procedures to reduce exposure hazard.

Household and school dust and children's exposure to lead

Children are not generally exposed to lead from paint while the paint is still in the can or when the paint is being newly applied to a previously unpainted or uncoated surface. However, as paint on household surfaces chips, wears and deteriorates over time, lead present in the deteriorating paint is released and contaminates surrounding surfaces.

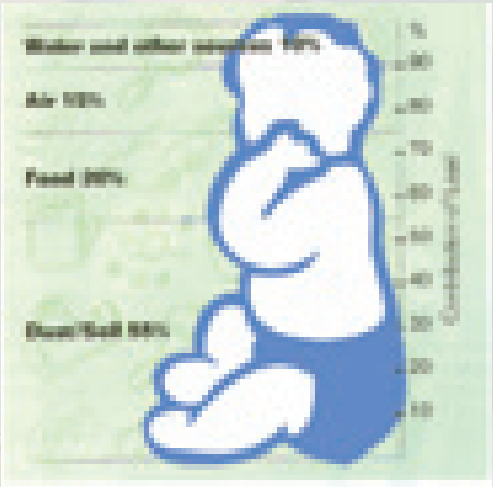

Figure 1 Source and Extent of Lead Exposure (Alperstein G.et. al. 1998)

In this way, lead in the paint will end up in the household dust and soil surrounding the house. Surfaces that are subjected to a lot of wear and tear, such as wooden windows, are major sources of lead contamination in dust (Dixon, et al., 2007). Even homes with intact lead paint are known to have higher dust lead levels. Very large amounts of lead-contaminated dust can also be produced when a surface that was previously painted with lead paint is sanded or scraped in preparation for repainting or remodeling without applying proper safety measures.

Children playing indoors or outdoors get house dust or soil on their hands and then ingest it through normal hand-to-mouth behavior (Lanphear, et al., 2002, and references therein). When the dust or soil is contaminated with lead, the children ingest lead, and lead contaminated dust and soil is the major pathway by which lead in paint contributes to childhood lead exposure (Lanphear, et al., 2002; Lanphear, et al., 1998). Hand-to-mouth behavior is especially prevalent in children aged six years and under, the age group most easily harmed by exposure to lead. It is estimated that a typical one- to six-year-old child ingests approximately 110 milligrams of house dust and soil each day (US EPA, 2008).

Several studies have shown that the presence of lead paint on the interior or exterior of a home and the lead content of the household dust are both strongly linked to children´s blood lead level (Clark, et al., 1985; Gaitens, et al., 2009; Lanphear, et al., 1998). This implies that lead paint remains a significant source of lead exposure to children for many years after it has been applied, even if the latest coat of paint does not contain lead.

Please see **Appendix 3** for additional information for how to reduce exposure to lead dust in homes, schools and hospital buildings.

A new and probably the first ever study in Nepal by Dr. K.D. Mehta (B.P. Koirala Institute of Health Sciences) reports on blood lead levels among school children in Kathmandu. The study, which evaluated blood lead levels among 304 primary school going children in Kathmandu Metropolitan City revealed that 73% of the children had detectable Blood Lead Levels (BLL), 66% had Blood Lead Levels higher than 5μg/dl and 55% levels higher that 10 μg/dl. Blood Lead Levels were significantly higher in children living in homes with chipped wall paint.

Health impacts of exposure to lead

The health impacts of long-term low level lead exposure in young children are lifelong, irreversible, and untreatable. Studies conducted over the last decades have shown harmful effects of lead at lower and lower blood lead levels, and no safe blood lead level in children has been identified (Bellinger, 2008). As a result, the U.S. Centers for Disease Control and Prevention (CDC) and other authorities have concluded that there is no known acceptable blood lead exposure level for children (CDC, 2013). 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 (Prüss-Üstün and Corvalán, 2006).

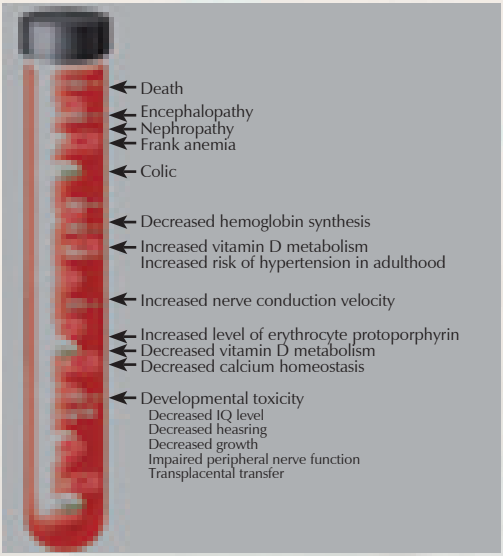

Figure 2 Pediatric effects of lead at various blood lead levels (WHO, 2010)

The cost of lead exposure to society can be significant. The World Health Organization (WHO) has estimated to account for 0.6 % of the global burden of disease, with the highest burden in developing countries. It means 143000 people died out of high lead exposure every year. Childhood lead exposure is estimated to contribute to about with some 600,000 new cases of children with intellectual disabilities every year. Of children affected by high exposure to lead live in low- and middle-income countries.

Once lead enters a child's body through ingestion or 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 it can also affect other areas such as the blood system, the kidneys and the skeleton.

Children are more sensitive to the harmful effects of lead than adults for several reasons, including:

- A child's brain undergoes very rapid growth, development and differentiation and lead interferes with this process. For example, it has been shown that moderate blood lead exposure (5 to 40 μg/dL) during early childhood is connected to region-specific reductions in adult gray matter volume (Cecil, et al., 2008).
- Exposure to lead early in life can re-program genes, which can lead to altered gene expression and an associated increased risk of disease later in life (WHO, 2010; Mazumdar, et al., 2012).
- Gastrointestinal absorption of lead is enhanced in childhood. Up to 50 percent of ingested lead is absorbed by children, as compared with 10 percent in adults. Pregnant women may also absorb more ingested lead than other adults. In addition, children are more likely to have nutritional deficiencies that lead to increased absorption of lead (WHO, 2010).

Costs of childhood exposure to lead

Though the economic costs associated with childhood exposure to lead are substantial, they are completely avoidable. Low cost, safe, high quality alternatives to lead have been produced and used for decades in industrialized countries. Eliminating lead in paint in developing countries and countries in transition is particularly important because paint sales in most countries are growing rapidly. Failure to address this problem now will have high social and economic costs later.

Reduced lifelong earnings. 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 (Mielke and Zahran, 2012). For example, it has been shown that blood lead levels as low as 2 μg/dl at an early age can cause an impact on end-of-grade tests in elementary school (Miranda, et al., 2007). This impact continues throughout life, has a long-term impact on the child's work performance, and-on average-causes decreased economic success as measured by lifelong earnings.

Higher social and development costs. Widespread lead exposure harms society as a whole by placing an extra burden on the national education system; raising national costs associated with increased crime and incarceration rates; and reducing the overall national productivity of labor. A recent study that investigated 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[1] per year (Attina and Trasande, 2013). 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:** $699.9 billion of economic loss or 1.88% of GDP.
- **Nepal: US$ 1,533,000,000 which is 4% of GDP $38,302,000,000**

Legacy cleanup costs. Current experiences in industrial countries illustrate the significant costs that occur when lead paint is allowed to be widely used. Despite being banned in 1978, three-quarters of homes in the United States still contain leaded paints, and leaded paint remains the primary source of childhood lead poisoning, particularly among children living in poverty (WHO, 2010).

Removing lead paint safely in the average U.S. house can cost anywhere from USD $10,000 to $45,000, a cost usually born by owners, taxpayers and/or government agencies. The cost to business can also be high. In California, three paint companies were recently required to pay the state USD $1.15 billion to abate lead paint from pre-1978 homes.

Previous studies of lead in paint in Nepal

Data collected and reported on by CEPHED in 2013 shows that a majority of oil-based, enamel decorative paint brands sold in Nepal contain high levels of lead – above 90 parts per million (ppm) – and could not be legally sold in

[1] 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."

most industrialized countries. CEPHED's report included an examination of 49 samples of enamel paint from 21 paint brands manufactured or sold for home use in Nepalese paint stores from Kathmandu, Lalitpur, Pokhara and Butwal. This report found that:

- 71% of samples analyzed, including some market leaders' brands, contained more than a proposed limit of 90 ppm of lead and would not be permitted for sale in the United States.
- Brightly colored paints (green, blue, red and yellow) most frequently contained high lead levels. Yellow, green, red and blue paints contained the highest lead concentrations with averages of 50,200 ppm, 36,800, 10,400 ppm and 2,700 ppm respectively.
- Lead above the proposed acceptable limit of 90 ppm was detected in paint samples from 16 of the 21 brands included in the study. Paint samples from 15 brands contained lead levels above 600 ppm, and paint samples from 12 brands contained dangerously high lead levels above 10,000 ppm.
- Most of the paints labeled with the Nepal Quality Certification Mark (NS Mark), contained lead above 90 ppm, whereas all paints with the label "**No Added Lead**" were found to contain low levels of lead (below or slightly above 90 ppm).

These findings are consistent with other studies documenting the availability of lead paints in developing countries (Clark, et al., 2006; UNEP, 2013; Brosché, et al., 2014). Since 2007, NGOs associated with the IPEN network have collected and analyzed decorative paints for sale on the market in 30 developing countries and countries with economies in transition. In every one of these countries, where there is no national law or regulation in force to control the lead content of paints, the majority of the enamel decorative paints for sale on the market contained lead levels above 90 parts per million (ppm). Many of the paints contained more than 1,000 ppm lead and would be prohibited for sale or use in virtually all highly industrial countries. In almost all cases however, the consumer had no way to tell which of the enamel decorative paints for sale contained added lead and which did not.

Lead Paint Terminology

As used in this report, the term ***"decorative paint"*** refers to paints that are produced for use on inside or outside surfaces (e.g. walls, windows, doors and floors) of homes, schools, commercial buildings and similar structures. Decorative paints are frequently used on doors gates and windows, and to

repaint household furniture such as cribs, playpens, tables and chairs. The term ***"enamel"*** as used in this report refers to oil-based paints. The term *"ppm"* means parts per million total lead by weight in the dried paint sample. ***Lead*** is a toxic heavy metal found in nature and has been used in various daily consumable items such as paints, cosmetics, battery etc

Detailed results: lead in household and school dust in Nepal

The current lead in household and school dust in Nepal study was undertaken to highlight the presence of high levels of lead in household dust and school dust, and the health hazard associated with high lead levels in dust. In order to be able to compare the results from the study with recommendations, previous published data, and information about hazardous levels of lead in household dust, the dust wipe method described by the U.S. Department of Housing and Urban Development (HUD) was followed (HUD, 2012). In addition, results from dust wipe analyses have been shown to correlate with children´s blood lead level (see e.g. Gulson, et al., 2013). The detailed method is described in **Appendix 1.** Floor dust wipe samples were taken at 23 buildings; 5 of which were schools buildings, 2 were hospital buildings and the remaining were residential homes.

Table 1 Results of the dust sample analysis

Location	Type	Total number of Samples	Below 10 $\mu g/ft^2$	10- 39 $\mu g/ft_2$	40 $\mu g/ft_2$ and higher
1.	Residential Home	3	100% (3 of 3)	0%	0%
2.	Residential Home	3	66% (2 of 3)	33% (1 of 3)	0%
3.	Residential Home	3	66% (2 of 3)	33% (1 of 3)	0%
4.	Residential Home	3	100% (3 of 3)	0%	0%
5.	Residential Home	3	100% (3 of 3)	0%	0%
6.	Residential Home	3	66% (2 of 3)	33% (1 of 3)	0%
7.	Residential Home	3	100% (3 of 3)	0%	0%
8.	Residential Home	3	100% (3 of 3)	0%	0%
9.	Residential Home	3	100% (3 of 3)	0%	0%
10.	Residential Home	3	100% (3 of 3)	0%	0%

Location	Type	Total number of Samples	Below 10 $\mu g/ft^2$	10- 39 $\mu g/ft_2$	40 $\mu g/ft_2$ and higher
11.	Residential Home	3	100% (3 of 3)	0%	0%
12.	Residential Home	3	66% (2 of 3)	33 % (1 of 3)	0%
13.	Residential Home	2	50% (1 of 2)	50% (1 of 2)	0%
14.	Residential Home	3	66% (2 of 3)	33% (1 of 3)	0%
15.	Residential Home	3	100% (3 of 3)	0%	0%
16.	Residential Home	3	100% (3 of 3)	0%	0%
17.	School 1	4	50% (2 of 4)	50% (2 of 4)	0%
18.	School 2	4	25% (1 of 4)	75% (3 of 4)	0%
19.	School 3	4	25% (1 of 4)	75% (3 of 4)	0%
20.	School 4	6	17% (1 of 6)	66% (4 of 6)	17% (1 of 6)
21.	School 5	4	0%	0%	100% (4 of 4)
22.	Hospital 1	3	100% (3 of 3)	0%	0%
23.	Hospital 2	3	100% (3 of 3)	0%	0%
Total		**75**	**69% (52 of 75)**	**24% (18 of 75)**	**7% (5 of 75)**

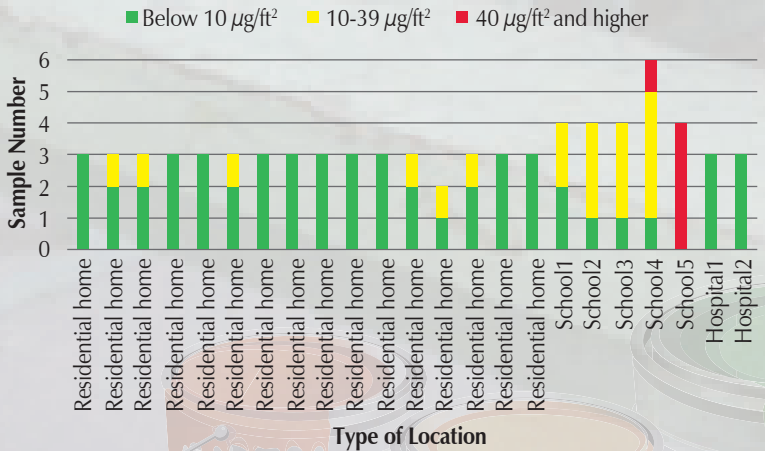

Figure 3 Lead level per sample and location

Lead in residential homes´ floor dust

16 residential homes were selected for sampling. One or more samples from 6 out of 16 (37.5%) residential homes contained levels of lead of more than 10 $\mu g/ft^2$. Most of the buildings with high lead samples were painted with bright colors. Ten of 16 (62.5%) of the residential homes had lead contamination below 10 $\mu g/ft^2$, which is below the level of concern. Though none of the residential buildings contained lead contamination of 40 $\mu g/ft^2$ or higher (an alarmingly high level of lead), 38% of locations do have a lead contamination between 10 -39 $\mu g/ft^2$, which may be of concern for all. CEPHED would like to take this opportunity to draw the attention of all residence and concerned government agencies to address this issues

Lead in private and public schools` floor dust

Of the five school locations sampled from Kathmandu and Laltipur included into this study, one was a government-owned public school. The remaining four were private boarding schools. All of the sampled schools building and class rooms were painted with dark or brightly colored paint i.e., blue, green and brown on the walls, on the furniture, the playground equipment or in other areas of the school.

Figure 4 Usages of paints and status of painted surface in school

The highest dust lead level recorded in this study, 108$\mu g/ft^2$, was from a well-regarded private boarding school situated at Minbhawan, Kathmandu (School 4). Of six samples taken from this building, one sample contained 108 $\mu g/ft^2$ lead contamination; four samples contained lead contamination between 10-39 $\mu g/ft^2$; and one sample contained lead level below 10 $\mu g/ft^2$. The sampling area with highest lead contamination was near to the wall area where much of the

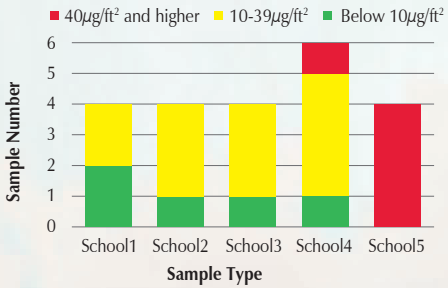

Figure 5 Lead level in school dust

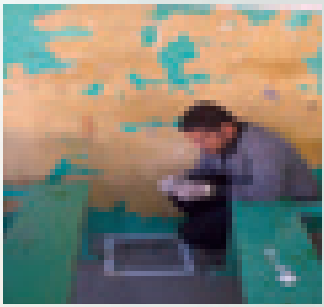

Figure 6 Dust sampling next to peeled off wall paints in the middle of classrom

paint had peeled off, which suggests that the high level of lead contamination resulted from either peeling wall paint (Fig 6) or from paint scraps that had peeled off from nearby desk and benches.

The second highest dust lead level recorded in this study, 106 μg/ft², was from another well-regarded private boarding school situated at Soaltee Mode, Kathmandu (School 5). All four samples from this building contained lead levels well above 40 μg/ft². At this location, almost every desk bench had peeling paint and some paint scraps were observed on the floor as well.

Figure 7 Students carefully watching the sampling procedure

At a private boarding school located at Imadol, Lalitpur (School 3), no samples had a lead dust contamination level of 40μg/ft² or higher. However, three sampling areas had lead dust contamination levels between 10 and 39 μg/ft². Sampling areas included floor areas in the middle of the classroom, door area, window area and playing area. Lead contamination was highest in the door and window area; areas that are likely to have more lead dust due to abrasion when windows and doors are frequently opened and closed.

At the private school located at Tinthana, Naikap (School 1), 2 out of 4 samples were found to have lead level below 10 $\mu g/ft^2$. The remaining locations contained dust with lead level 10-39 $\mu g/ft^2$.

At the government school (School 2), 3 of the 4 samples (75%) had high lead content i.e. dust with lead level above 10 $\mu g/ft^2$. The remaining sample contained lead level below 10 $\mu g/ft^2$.

Figure 8 Sampling inside the classroom

Lead in hospitals´ floor dust

All samples taken at two hospital buildings from Kathmandu and Lalitpur were found to have lead contamination below 10 $\mu g/ft^2$. Observations made when the samples were taken suggests that these hospital buildings engage in appropriate sanitation practices, with regular cleaning three to four times a day. This frequency of cleaning makes the buildings healthier and reduces the chances of lead contamination from dust.

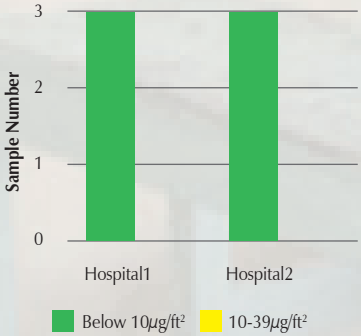

Figure 9 Lead levels in hospital dust

Summary of Results

The results of testing for lead dust in residential homes, hospitals and schools suggests that public and private schools may have the most serious problem with lead dust contamination. Overall, 17 of 22 (77%) of the school floor dust samples had lead levels of 10 $\mu g/ft^2$ and higher, 12 of the samples (54%) had lead levels between 10 and 39 $\mu g/ft^2$ and 5 of the samples (23 %) had lead levels at 40 $\mu g/ft^2$ and higher. This demonstrates a clear hazard in the school environment requiring immediate attention from the concerned government agencies especially from Ministry of Education, Department of Education (DOE), PABSON and N PABSON.

Case study

CEPHED's lead dust sampling team visited 23 sampling locations around the valley, i.e. Thimi, Lokanthali, Imadol, Tinkune, Naikap, Jawalakhel, Tripureshwor and Naikap area of Kathmandu, Lalitpur and Bhaktpur districts of Nepal. CEPHED used the following sampling criteria:

- Window and entrance door areas where there is a high chance of contamination due to lots of frictional and abrasion activities.
- Older buildings since the older a building, the more likely that paints with high lead content were used and that multiple coats of paint have been applied.
- The presence of bright colored paints on some of the doors, window, trim, furniture, walls etc. Bright colored paints tend to have higher lead content than white or similar shades of paint. Therefore, houses with only white paints, as a rule, are less likely to have lead contamination.
- Visual evidence of loose or chipped paints. The paint that comes off the surface is what ends up as dust -- if the paint is leaded, the dust will also be leaded.
- Evidence of repainting or remodeling. Repainting involves removing portions of the old paint that are loose or rough prior to applying the new paint. This usually involves a combination of such things as scraping and sanding which produce large amounts of dust.

During CEPHED sampling, many of the school were in holiday phase or session ending phase. During those periods, peeling paint from desks and benches and paint scraps on floor and cracks around buildings are clearly evident. CEPHED also took a sample from school play areas, although the lead content in floor dust wipe samples taken from school play areas were found to be less than the reference level (10 microgram per square foot), suggesting that no external sources of lead are contaminating the soil.

Calculations show that an area of one square centimeter painted with lead paint can contaminate up to a square meter area once the paint degrades to dust, which inevitably occurs in areas of high traffic or use like classrooms and

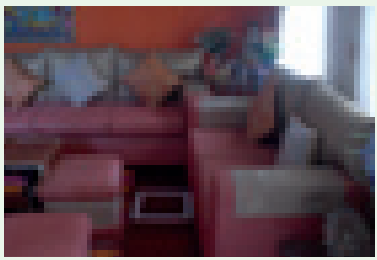

Figure 10 Sample taking from newly renovated house

hallways. In one such case, CEPHED measured a contamination level equal to 108 micrograms per square foot.

CEPHED also collected samples at a newly renovated house. Before sampling, we queried about the paint residents had used. The residents reported that they had used lead free paint. We verified this statement later by observing the label on the paint can during the sampling itself. We were also encouraged by finding that samples at this location had lead dust levels below the reference level (10 microgram per square foot), suggesting that using un-leaded paint while renovating or painting their houses is a practical alternative.

CEPHED also took samples from Child Care Units at two hospital buildings. We were concerned about child exposure as well as a few cracks around the room where contaminated dust might lodge. Again, we were encouraged to find that hospital samples were below the reference limit of 10 microgram per square foot. We also observed that hospital buildings are cleaned approximately three times a day, which likely plays a role in keeping lead dust contamination levels low. This also indicates that maintaining sanitation in and around houses can reduce lead exposure and make a safer and healthy environment.

Figure 11 Sampling from CCU

Recommendations

Government and government agencies

- Fast track the approval of a strong regulation that will ban the manufacture, importation, distribution, sale and use of household paint products with total lead content (dry weight) above the maximum limit of 90 ppm.
- Establish strong enforcement measures, including periodic monitoring to ensure paint companies are in compliance with the 90 ppm standard.

- Immediately take the decisions of Green Public Procurement Policy (GPPP) i.e., only purchase non-leaded paints, and effectively implement it.
- Provide incentives to paint companies to swiftly transition from lead to non-lead paint production.
- Require paint container labels to indicate the lead content and provide a warning of possible lead dust hazards when disturbing painted surfaces.
- Source only unleaded paints for interiors of public buildings, government-sponsored housing, schools, day care centers, medical facilities etc.

Paint Industry, Nepal Paint Manufacturers Associations and Chamber of Commerce Organizations

- Discontinue the use of lead as driers or pigments and other purposes in paint formulations and shift to non-lead substitutes
- Commit to an expedited switch to producing paint products with lead content below 90 ppm, and provide lead-dust hazard warnings on paint can labels.
- Commit to a third-party certification and labeling program to ensure that all paints sold in the market meet the proposed regulatory standard of 90 ppm and to help customer distinguish between paints that are safe and those that are not.
- Provide information to paint dealers and retailers on lead hazards that can be distributed to customers.
- Nepal Paint Manufacturers Associations and Chamber of Commerce such as The Federation of Nepalese Chambers of Commerce and Industry (FNCCI) and Nepal Chamber of Commerce (NCC) should educate their members about the hazards of lead paint and encourage their members to import, produce and sell only non-leaded paints, and assist all member paint industries to make a shift to non leaded paints.

Department of Education, Ministry of Education and School Organizations (PABSON, N PABSON)

- Immediately ban the use of leaded paints for all school infrastructures, e.g. buildings, furniture, playing gardens and toys.
- Ask and look for Material Safety Data Sheets and labels indicating lead content when purchasing paints and toys.
- Make a mandatory circular or notification to all the schools, colleges both in public and private sectors to only use non-leaded paints.

- Immediately take the decisions of Green Public Procurement Policy (GPPP), i.e., only purchase non-leaded paints, and effectively implement it.
- Include chemical safety issues in the academic curricula at all levels.
- Use only non-leaded paints for renovation and repainting of school infrastructures.

Consumers

- Ask for unleaded paints for safer homes and patronize businesses that sell unleaded paints.
- Ask your children schools whether they have used the unleaded paint in their school or not?
- If you suspect that your child has been exposed to high levels of lead in dust or from other sources, contact your local hospital to have their blood levels checked.
- If you are concerned about lead paint in your home, please see recommendations in Appendix 3 of this report

Public Health Organizations

- Support policy measures that will eliminate childhood lead exposure from all sources
- Join in efforts to inform the public about childhood health and occupational health risks linked with lead paints and lead dust.
- Promote efforts to make blood lead testing available.
- Encourage specification of "non-leaded paints" on purchase orders of larger paint consumers such as schools, day-care centers, and large housing property owners/managers.

Advertising Agencies, Media houses and Celebrities

- When advertising or becoming brand ambassador for any paint product, make sure that you know its ingredients and avoid supporting paints containing lead at levels dangerous to children.

All Stakeholders

- Support policy measures that will eliminate childhood lead exposure from all sources.
- Join in efforts to inform the public about childhood health and occupational health risks linked with lead paints and lead dust.

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Appendix 1: Lead Dust Wipe Sampling Methodology

Selection of Sampling Locations

Floor dust wipe samples were taken indoors in 23 buildings of which 2 were of hospitals, 5 were schools and 16 were residences. The following criteria were used in selecting sample locations:

- Housing in areas with no visible other potential sources of lead contamination (such as industrial or recycling areas)
- Houses with damaged paint on the interior surfaces
- Houses with interiors planted in bright colors
- Houses with painted surfaces that are subjected to a lot of wear and tear, such as wooden windows and wooden door/ doorframes
- Houses that have undergone repainting, general renovations, or significant maintenance projects

A few days before sampling, representatives of CEPHED contacted adult residents living in houses in localities from Kathmandu Valley identified as potential lead dust sources. Permission to sample a total of 23 homes/schools was given. In all cases, residents were provided with information about the hazards of lead exposure, the reasons why lead dust sampling at their house/ school might be appropriate; and the lead dust sample collection and analysis process. They also were provided with a Lead in Paint sticker, Bookmark, Poster and Briefing Paper describing the lead in paint issues. The results from the individual locations were shared with each participant prior to the report's release **(Appendix 2)**. Parents, in locations with children under age 7, were provided information (if available) where their child's blood could be tested to check for lead levels. Residents were also given information about proper procedures for cleaning to remove dust **(Appendix 3)**. The sampling was conducted by representatives of CEPHED.

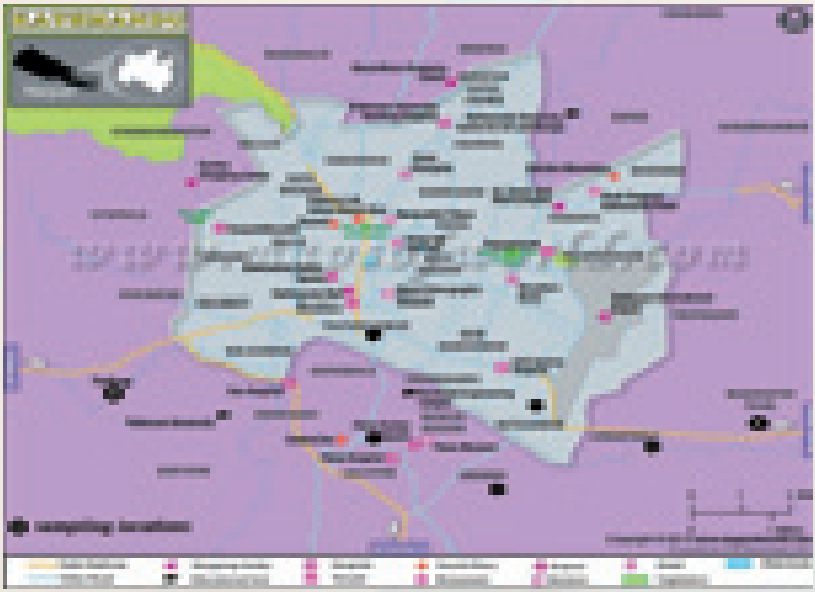


Figure 12 Sampling Locations around Kathmandu Valley

Materials

The following materials were used for dust wipe sampling:

- Disposable Wipes, ASTM standard for lead in surface dust
- Gloves, Non-sterilized and non-powdered
- Zip Lock bags
- Tape
- Square plastic template (30 X 30 cm^2)
- Wet wipes for cleanup
- Centrifuge Tubes (50 ml size), certified lead free

Sample Collection

The dust samples were collected according to the dust wipe method described by the U.S. Department of Housing and Urban Development (HUD, 2012):

- The surface to be sampled was determined
- The template (a rectangle the size of 30 X 30 cm^2) was carefully placed on the sample area and the outside edges were taped to the floor to keep it from moving while wiping
- The wipes were inspected in order to make sure they were moist, and the plastic containers to make sure they were unopened and still uncontaminated.

- The caps of the plastic containers were partly unscrewed, and a clean pair of disposable gloves was donned.
- A first pass with the wipe was made side-to-side with as many "S"-like motions as are necessary to completely cover the entire sample area.
- The wipe was folded with the contaminated side facing inward, and a second pass was made top-to-bottom in the same "S"-like motions as previous pass.
- The wipe was again folded with the contaminated side facing inward, and a third wipe pass was made around the perimeter of the sampled area.
- The wipe was again folded with the contaminated side facing inward again, and inserted without touching anything else into the centrifuge tube. The lid was securely fastened, and the tube labeled.

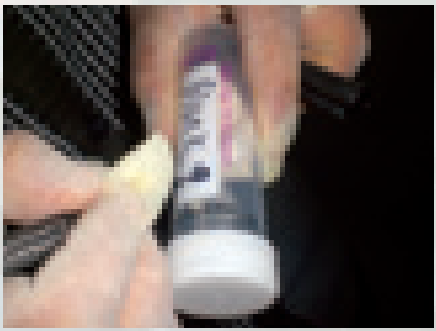
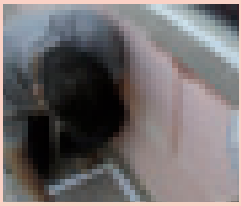


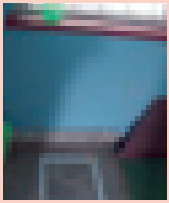
Figure 13 Blank Sample

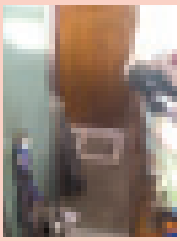
There were 4 blank samples randomly taken from different locations around Kathmandu Valley. Field blank samples were taken by removing a wipe from the package with a new glove, shaking the wipe open and refolding it in a manner similar to that used during the actual wipe sampling procedure. The blank was inserted in the same way it into a centrifuge tube without touching any other surface or object, and the tube labeled with a sample number. All blanks were labeled in a similar way as the dust samples to keep them undisclosed to the lab. Field sampling forms were filled-in and kept throughout the sampling to keep track of each sample identity and details.

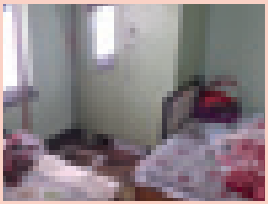
The samples were analyzed using method **NIOSH 7082** (LEAD by **Flame AAS**) in Forensic Analytical Laboratories, Inc. situated in the US. Forensic Analytical Laboratories is fully accredited by the American Industrial Hygiene Association (AIHA), the National Voluntary Laboratory Accreditation Program (NVLAP), and the California Department of Health Services (Cal DHS). The metal laboratory is also successful participants in the PAT, ELPAT and EMPAT programs and maintain a rigorous in-house QA/QC program to ensure the most accurate and legally defensible results possible.

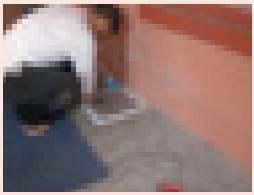
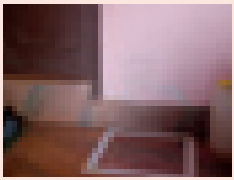
Appendix 2: Lead Dust Wipe Study Results

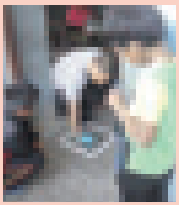
Sample Number	Room	Sampling place	Surface Type	Paint Color	Floor dust-lead level µg/sq ft
Residential Home 1			**Justification for household Selection**: • More than 20 years old • There were cracks inside the house. • Presence of 3 children • Regular painting activities		
A	Living room	Playing area (middle of room)	Concrete	Yellow (wall)	< 8
B	Entrance	Front door	Concrete	Brown	< 8
C	Living room	Window	Concrete	Red (wall)	< 8
Residential Home 2			**Justification for household Selection:** • Presence of children • Cracks in playing as well as living room • Regular painting activities • 10+ year old house		
A	Kitchen	Entrance Gate	Concrete	Red (wall)	< 8
B	Living Room	Entrance Gate	Concrete	Red (wall)	< 8
C	Living Room	Window	Concrete	Red (wall)	29
Residential Home 3			**Justification for household Selection:** • 25+ years old house • Presence of kids • Regular painting activities		
A	Floor (Ground)	Entrance Door	Concrete	Brown	< 8

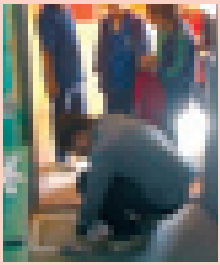
Sample Number	Room	Sampling place	Surface Type	Paint Color	Floor dust-lead level µg/sq ft
B	1st Floor	Door (Living Room)	Concrete	Red (wall)	< 8
C	2nd Floor	Window	Concrete	Red (wall)	21
Residential Home 4		**Justification for household Selection:** • Newly painted • Presence of kids • Lots of cracks around window and door area • Previously painted in yellow. Currently it's white and planning to go for Red			
A	Living	Middle	Mat	Red (wall)	< 8
B	Living	Window	Mat	White	< 8
C	Living	Door	Concrete	Brown	< 8
Residential Home 5		**Justification for household selection:** • There were cracks inside the house. • Regular painting activities • Presence of bright color (Red)			
A	Living	Door/window	Mat	Brown	< 8
B	Living	Window	Mat	Yellow (wall)	< 8
C	Living	Entrance Door	Concrete	Red (wall)	< 8
Residential Home 6		**Justification for household selection:** • More than 5+ years old • Presence of 2 children • Regular painting activities • Presence of crack • Presence of bright color (Green from outside)			
A	Living	Middle	Marble	Blue and brown	< 8
B	Entrance	Door	Marble	Blue (wall)	< 8
C	Living	Window	Marble	Blue (wall), white (window)	15

Sample Number	Room	Sampling place	Surface Type	Paint Color	Floor dust-lead level µg/sq ft
Residential Home 7			**Justification for household selection**: • More than 15 years old • Presence of cracks inside the house and around the door or window area. • Presence of child below 3 years of age • Regular painting activities • Presence of Pink color and Brown color		
A	Entrance	Door	Concrete	Brown	< 8
B	Living	Entrance door	Concrete	Pink (wall)	< 8
C	Living	Window	Concrete		< 8
Residential Home 8			**Justification for household selection:** • More than 20 years old • There were cracks inside the house. • Presence of 2 children (below 3 years of age) • Regular painting activities		
A	Entrance	Door	Concrete (Rough)	Brown	< 8
B	Living Room	Door	Concrete (Rough)	Blue (wall)	< 8
C	Living Room	Door	Concrete (Rough)		< 8
Residential Home 9			**Justification for household selection:** • More than 15 years old • There were cracks inside the house. • Presence of 3 children (10 years or below) • Just painted month ago (Red paint)		
A	Living	Door area	Concrete	Red (wall)	< 8
B	Living	Playing area	Mat	Red (wall)	< 8
C	Open Space	Entrance Door	Tile		< 8

Sample Number	Room	Sampling place	Surface Type	Paint Color	Floor dust-lead level µg/sq ft
Residential Home 10			**Justification for household selection:** • More than 20 years old • There were cracks inside the house. • Presence of 2 children • Regular painting activities		
A	Living	Window	Mat	Green	< 8
B	Living	Door	Tile	Red and Brown	< 8
C	Entrance	Door+ Gate	Concrete	Brown	< 8
Residential Home 11			**Justification for household selection:** • More than 8 years old • There were cracks inside the house. • Presence of children (4) • Regular painting activities (Blue from outside)		
A	Entrance	Door	Concrete	Blue (wall) and brown	< 8
B	Living	Window (Playing area)	Concrete	Brown	< 8
C	Living	Door	Concrete	Blue (wall) and Brown	< 8
Residential 12			**Justification for household selection:** • More than 10 years old • There were cracks inside the house. • Presence of 1 children • Brightness of color • Regular painting activities		
A	Living	Playing room (window)	Concrete	Blue (wall)	24
B	Living	Playing room Window	Concrete	Blue (wall)	< 8
C	Living	Door	Concrete	Blue (wall)	< 8

Sample Number	Room	Sampling place	Surface Type	Paint Color	Floor dust-lead level µg/sq ft
Residential Home 13			**Justification for household selection:** • More than 5 years old • Presence of cracks inside the house. • Regular painting activities		
A	Living	Window	Concrete	White	< 8
B	Living	Window	Concrete	White	17
Residential Home 14			**Justification for household selection**: • More than 5 years old • There were cracks inside the house. • Presence of bright color • Regular painting activities (Red from outside)		
A	Living	Door	Concrete	Blue (wall)	
B	Living	Window	Concrete	Red (wall)	
C	Living	Window	Concrete	Red (wall)	
Residential Home 15			**Justification for household selection:** • More than 10 years old • There were cracks inside the house. • Presence of 1 children • Regular painting activities • Bright color		
A	Living	Door	Marble		< 8
B	Living	Door	Marble		9
C	Living	Middle	Marble		< 8
Residential Home 16			**Justification for household selection:** • More than 10 years old • Presence of 2 children • Just painted (few month back)		

Sample Number	Room	Sampling place	Surface Type	Paint Color	Floor dust-lead level µg/sq ft
A	Living	Door	Marble	Red (wall), Brown	< 8
B	Living	Nearby window	Marble	Green (wall)	< 8
C	Living	Middle of room	Marble	Red (wall)	< 8
School 1			**Justification for household Selection:** • It was school (private) • Lots of cracks • Blue colored Desk and benches		
A	Playing Room	Middle of room (playing area)	Concrete	Red (wall)	
B	Playing Room	Window	Concrete	Brown	
C	Class Room	Entrance	Concrete	Brown (door)	
D	Class Room	Window	Concrete	Brown	
School 2			**Justification for household Selection:** • It was governmental school • Regular painting activities • 15+ years old building • Cracks inside the classroom, paint scraps in desk, bench		
A	Class Room	Window	Concrete	Blue (wall)	17
B	Class Room	Entrance Door	Concrete	Brown	< 8
C	Class Room	Corner (near the window)	Concrete	Blue (wall)	17
D	Class Room	Window	Concrete	Blue and Red (wall)	13

Sample Number	Room	Sampling place	Surface Type	Paint Color	Floor dust-lead level µg/sq ft
School 3			**Justification for household selection:** • More than 10 years old • School building • Regular painting activities • Blue colored wall and door, green color from outside • Presence of paint scraps • Blue colored des and benches		
A	Class Room	Middle of room	Concrete	Green	
B	Class Room	Door	Concrete	Blue	
C	Class Room	Window	Concrete	Blue	
D	Ground	Playing Area	Concrete		
School 4			**Justification for household selection:** • More than 15 years old • School building • Regular painting activities • Presence of paint scraps around desk bench and wall (blue, yellow and red colored chairs and desks) • Presence of different colored wall (yellow, blue, green and red) and blue colored grill		
A	Class Room	Middle of room	Concrete	Green/Blue	27
B	Class Room	Door	Concrete	Green (wall)/ Blue (door)	20
C	Corridor	Window	Concrete	Yellow (wall)	< 8
D	Class Room	Middle of room	Concrete	Green (wall)/blue (window)	17
E	Class Room	Door	Concrete	Blue	28
F	Class Room	Middle (near wall)	Concrete	Green/yellow	108
School 5	**Justification for household selection:** • School building • Presence of paint scraps around desk bench and wall (green in desk, yellow in wall and brown door) • Since its school building, can be assumed as regular painting activities*				

Sample Number	Room	Sampling place	Surface Type	Paint Color	Floor dust-lead level µg/sq ft
A	Class Room	Middle of room	Concrete		58
B	Class Room	Near Door	Concrete		64
C	Class Room	Door area	Concrete		66
D	Class Room	Middle of room	Concrete		106
Hospital 1		**Justification for household selection:** • Lots of cracks around building • Child treatment unit • Presence of Yellow color (previously), currently it's blue.			
A	Child Care Unit (CCU)	Entrance Door	Mat	Blue	< 8
B	CCU	Treatment area (middle)	Mat	Blue	< 8
C	CCU	Window	Mat	Blue	< 8
Hospital 2		**Justification for household selection:** • More than 5 years old • There were cracks inside the house. • Frequent visit of children • Presence of bright color (Red)			
A	Living	Entrance (main)	Mat	Red (wall)	< 8
B	Living	Entrance (room)	Mat	Red (wall)	< 8
C	Ladder	Window/Door	Marble	Red (wall)	< 8

*There is accumulating evidence that dust lead levels as low as 8 $\mu g/ft^2$ can be considered a lead-dust hazard

Appendix 3: Keeping Your Home Lead Dust Free

Keep your home clean through wet wiping. Ordinary household dust and dirt may contain lead. Children can swallow lead or breathe lead contaminated dust if they play in dust or dirt and then put their fingers or toys in their mouths, or if they eat without washing their hands first.

- Keep the areas where your children play as dust-free and clean as possible.
- Wash pacifiers and bottles after they fall on the floor. Keep extras handy.
- Clean floors, window frames, window sills, and other surfaces weekly. Use a mop, sponge, or paper towel with warm water and a general all-purpose cleaner.
- Thoroughly rinse sponges and mop heads after cleaning dirty and dusty areas.
- Wash toys and stuffed animals regularly.
- Make sure your child does not chew on anything covered with lead paint, such as painted window sills, cribs, or playpens.

Handle surfaces painted with lead carefully. Families have been exposed to high levels of lead by scraping or sanding lead paint without adequate dust control because these activities generate large amounts of lead dust. Lead dust from repairs or renovations of older buildings can remain in the building long after the work is completed. Heating paint to loosen it so that it can be removed also may release lead into the air.

- Don't burn painted wood as it may contain lead.
- Children and pregnant women should not be present in housing undergoing substantial renovation, or participate in activities that disturb old paint prior to re-painting, or clean up paint debris after work is completed.
- Isolate areas when wet sanding or scraping or other activities that disturb painted surfaces from living and play areas. Close and lock doors to keep children away from dusty areas or where paint is chipping or peeling. Cover holes in walls or seal off openings, so children aren't exposed to lead dust.

Lead-safe Work Practice Training for Workers Engaged in Renovation, Remodeling and Painting(RRP)

- Special training courses are needed to learn work practices needed to protect families in housing where RRP is occuring

Try to avoid bringing lead dust into the home. People may unknowingly bring lead into the home on their hands, feet or clothes.

- If possible, people working working in construction, demolition or painting or who work with batteries, or in a radiator repair shop or lead factory should wear protective outer clothing and foot covers or change their clothes and shower before going home. If that's not possible, keep work clothes separate from other household items and away from children.
- Try to keep children from eating dirt, and make sure they wash their hands when they come inside or eat.

Eat right. Feed children healthy, low-fat foods high in calcium, iron, and vitamin C. Lead in the body stops good vitamins, such as iron and calcium, from working right.

PLEASE JOIN HAND TO CELEBRATE

International Lead Poisoning
Prevention Awareness Week

ELIMINATING LEAD IN PAINTS

Lead Free
KIDS
for a Healthy Future

GET THE FACTS

http://www.who.int/ipcs/lead_campaign/en

143 000
annual death from lead exposure or 0.6% of the global burden of disease from lead exposure.

600 000
new cases every year of children with intellectual disabilities from lead exposure.

Overall 99%
of children affected by high exposure to lead live in low- and middle-income countries.

USE LEAD FREE PAINTS, OTHER PRODUCTS, PROTECT YOURSELF & YOUR CHILDREN

To reduce or eliminate the impact of lead containing paint used in buildings, furniture's, children toys, playground, sport materials and other construction materials, it is requested to all especially parents, guardians, government, private and community schools, teachers etc. use paint with logo of "NO ADDED LEAD or LEAD FREE" only.

NO ADDED LEAD, MERCURY AND CHROMIUM
LOW VOC

NO ADDED LEAD, MERCURY, CHROMIUM, ARSENIC & ANTIMONY

NO VOC & LEAD FREE
HEALTHY HOME PAINTS

No Added Lead, Mercury, Arsenic & Chromium

Safe for Earth
No Added Lead, Mercury, Arsenic & Chromium

USE LEAD FREE PAINTS AVAILABLE IN MARKET WITH ANY OF THESE LOGOS AND STAY SAFE & HEALTHY.

CEPHED

Center for Public Health and Environmental Development
Imadole-5, Lalitpur, Kathmandu, Nepal
Tel. & Fax No.: +977-1-5201786
Mobile: +977-9803047621
Email: cepheld04@yahoo.com