

# LEAD IN SOLVENT-BASED PAINTS FOR HOME USE IN THE GAMBIA



June 2018



## NATIONAL REPORT

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While this study was undertaken with funding assistance from the New York Community Trust and the Swedish Government, responsibility for the content lies entirely with IPEN and YVE—The Gambia. The New York Community Trust and the Government of Sweden do not necessarily share the expressed views and interpretations.

Established in 1998, IPEN is currently comprised of over 500 Participating Organizations in 125 countries, primarily developing and transition countries. IPEN brings together leading environmental and public health groups around the world to establish and implement safe chemicals policies and practices that protect human health and the environment. IPEN's mission is a toxics-free future for all.

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# CONTENTS

<b>Preface</b> .....	<b>4</b>
<b>Executive Summary</b> .....	<b>6</b>
<b>1. Background</b> .....	<b>10</b>
<b>2. Materials and Methods</b> .....	<b>16</b>
<b>3. Results</b> .....	<b>19</b>
<b>4. Conclusions and Recommendations</b> .....	<b>23</b>
<b>References</b> .....	<b>25</b>
<b>Appendix</b> .....	<b>26</b>

# PREFACE

Lead paints for home use continue to be widely produced, sold, and used in developing countries even though most highly industrial countries banned lead paints for household use more than 40 years ago. IPEN and Participating Organizations are part of the global movement to eliminate lead paint by 2020 to protect children's health.

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 contained dangerously high lead levels. In response, IPEN launched its Global Lead Paint Elimination Campaign, which seeks to eliminate lead in paint and raise widespread awareness among business entrepreneurs and consumers about the adverse human health impacts of lead paint, particularly on the health of children. Since then, IPEN-affiliated NGOs and others have sampled and analyzed paints on the market in approximately 50 low- and middle-income countries.

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

This study was conducted by the Young Volunteers for the Environment (YVE)—The Gambia in partnership with IPEN.

IPEN is an international NGO network of health and environmental organizations from all regions of the world of which YVE—The Gambia is a member. 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.

YVE—The Gambia is a registered non-profit youth-led Pan-African organization, and a chapter of Jeunes Volontaires pour l'Environnement (JVE International) based in Togo which predominantly advocates for environmental sustainability in the scope of access to basic energy, water and sanitation services; waste management; cultural biodiversity and eco-conscience; climate change; natural resource management and sustainable development.

In our programmes, we engage local and regional actors on issues related to youth participation in the development process committed in training young people and local communities in the philosophy of promoting love for ecology, environmental protection and sustainability, coastal and ecological building, clean energy, social justice and entrepreneurship, chemical safety, climate change and the integrated management system of waste and water resources.

We work in partnership with schools, local communities and government authorities to help improve the livelihoods of youth and vulnerable communities by empowering communities formulate and implement development plans and programs that promote sustainable development. We help to ensure proper citizen monitoring and control of public action and ensure adequate participation of young people and local community members in relevant programs.

YVE—The Gambia is managed by a dynamic and experienced Board of Directors, and an Executive Staff, with innovative, passionate, trained and committed group of volunteers. YVE meets annually at its General Assembly for activity reports, financial plans and program reviews.

# EXECUTIVE SUMMARY

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

The younger the child, the more harmful lead can be, and children with nutritional deficiencies absorb ingested lead at an increased rate. The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child. 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.

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

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. In The Gambia, there is currently no regulation in place limiting the amount of lead in paint for household and decorative use.

From 18th to 27th December 2017, the YVE—The Gambia purchased a total of 39 cans of solvent-based paint intended for home use from stores in Basse and Kanifing, The Gambia. The paints represented 11 different brands produced by 11 manufacturers, all of which were imported from Brazil, China, Lebanon, Morocco, and the United Arab Emirates (UAE). All paints were analyzed by an accredited laboratory in the United States of America for their lead content, based on dry weight of the paint. The laboratory participates in the Environmental Lead Proficiency Analytical Testing (ELPAT) program operated by the

American Industrial Hygiene Association (AIHA), assuring the reliability of the analytical results.

## RESULTS

Twenty-four out of 39 analyzed solvent-based paints for home use (62 percent of paints) were lead paints, i.e., they contained lead concentrations above 90 parts per million (ppm, dry weight of paint). This is also the regulatory limit for lead in decorative paint in e.g., Cameroon, India, Kenya, and the United States of America. Moreover, 16 paints (41 percent of paints) contained dangerously high lead concentrations above 10,000 ppm. The highest lead concentration detected was 100,000 ppm in two yellow paints sold for home use from the brands National and Oasis.

On the other hand, 15\* out of 39 solvent-based paints for home use (38 percent of paints) contained lead concentrations at or below 90 ppm, suggesting that the technology to produce paint without lead ingredients exists in countries exporting their paints to The Gambia. The paints included in this study were produced in Brazil, China, Lebanon, Morocco and the UAE.

Nine out of 11 analyzed brands (82 percent of paint brands) sold at least one lead paint, i.e., a paint with lead concentration above 90 ppm. Similarly, nine out of 11 analyzed brands (82 percent of paint brands) sold at least one lead paint with dangerously high lead concentrations above 10,000 ppm.

Yellow paints most frequently contained dangerously high lead concentrations above 10,000 ppm. Of 10 yellow paints, nine (90 percent of yellow paints) contained lead levels above 10,000 ppm; of five orange paints, four (80 percent of orange paints) contained lead levels above 10,000 ppm; and of 11 red paints, three (27 percent of red paints) contained lead levels above 10,000 ppm.

In general, paint can labels did not carry meaningful information about lead content or the hazards of lead paint. Only eight out of 39 paints (21 percent of paints) provided information about lead on their labels and most paints carried little information about any ingredients on can labels. Two Oasis enamel paints contained lead levels ranging from 6,000 ppm to 100,000 ppm despite markings on labels which says, “100% lead free,” while one Oasis enamel paint contained 65,000 ppm lead despite a “no added lead” mark on its label. In addition, three Pastel enamel paints contained lead levels ranging from 9,400 ppm to 42,000 ppm despite “lead free” claims on paint can labels.

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\* Four paints (GAM-34, GAM-37, GAM-38 and GAM-40) contained lead concentrations “below 300 ppm” and “below 200 ppm.” For this study, we classified these paints under the “below 90 ppm” category.

Most paints were merely labeled as “solvents, pigments and resin,” with no further details on the type of solvents and pigments (organic or inorganic) provided on paint can labels. Manufacturing dates were included on the labels of 24 out of 39 paints (62 percent of paints), and batch numbers were included on the labels of 15 out of 39 paints (38 percent of paints) included in this study. Most warning symbols on the paint cans indicated the flammability of the paints, but no precautionary warnings on the effects of lead dust to children and pregnant women were provided.

## CONCLUSIONS

This study demonstrates that solvent-based paints for home use with high concentrations of lead are widely available in The Gambia since the paints included in this study are brands commonly sold in retail stores all over The Gambia. Since all paints were imported from other countries, it is important to establish import controls to ensure that paints coming into The Gambia do not contain lead. It is also important that these paints be subjected to independent verifications given the prevalence of paints with “lead free” claims containing very high lead levels. The study results provide a strong justification to adopt and enforce a regulation that will ban the manufacture, import, export, distribution, sale and use of paints with total lead concentrations greater than 90 ppm.

## RECOMMENDATIONS

To address the problem of lead in paint, the YVE—The Gambia and IPEN propose the following recommendations:

### ***Government and Government Agencies***

The National Environment Agency of The Gambia should immediately draft a regulation which will be added to the existing Hazardous Chemicals and Pesticides Management Act that will ban the manufacture, import, export, distribution, sale and use of paints that contain total lead concentrations exceeding 90 ppm, the most restrictive standard in the world. According to the Gambia Standards Bureau, a national standard on lead in paint shall be developed this year under the National Standardization Strategy Action Plan (2018-2020). The Ministry in charge of Trade and Industry should also require paint companies to display sufficient information indicating harmful content on paint can labels such as solvents and provide a warning on possible lead dust hazards when disturbing painted surfaces. Given that a number of paint brands with “lead free” claims were found to contain very high lead levels, the Ministry of Trade and Industry should penalize paint manufacturers engaged in producing false advertisements. Section 12 of the Consumer Protection Act 2014 states that, “Any

false or misleading offer, promotion or advertising of goods or services shall be subject to investigation and prosecution.”

### ***Paint Industry***

Paint companies that still produce lead paints should expeditiously stop the use of leaded paint ingredients in paint formulations. Paint companies that have shifted to non-lead paint production should get their products certified through independent, third party verification procedures to increase the customer’s ability to choose paints with no added lead.

### ***Paint Factories, Importers and Distributors***

Paint distributors that import lead paints for sale in the country should only import and sell paints independently verified to be produced without lead to influence the paint industry to shift to non-lead paint production. Paint factories that also import raw materials for the production of paints should stop importing leaded paint ingredients.

### ***Individual, Household and Institutional Consumers***

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

### ***Organizations and Professional Groups***

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

### ***All Stakeholders***

All stakeholders should come together and unite in promoting a strong policy that will eliminate lead paint in The Gambia.

# 1. BACKGROUND

## 1.1 HEALTH AND ECONOMIC IMPACTS OF LEAD EXPOSURE

Children are exposed to lead from paint when lead-containing paint on walls, windows, doors or other painted surfaces begins to chip or deteriorate, since this causes lead to be 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 dust is produced, which, when spread, can constitute a severe health hazard.<sup>[1]</sup>

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 dust or the soil is contaminated with lead, the children will 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.<sup>[2]</sup>

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 paint 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 directly ingest the lead-contaminated, dried paint when chewing on them. Nonetheless, the most common way that children ingest lead is through lead-contaminated dust and soil that gets onto their hands.<sup>[3]</sup>

While lead exposure is also harmful to adults, lead exposure harms children at much lower levels. In addition, children absorb up to five times as much of ingested lead than adults. Children with nutritional deficiencies absorb ingested lead at an even increased rates.<sup>[2]</sup>

The younger the child, the more harmful lead can be and the health effects are generally irreversible and can have a lifelong impact. The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child.<sup>[4]</sup> Lead is also transferred through breast milk when lead is present in a nursing mother.<sup>[5]</sup>

Once lead enters a child's body through ingestion, inhalation, or across the placenta, it has the potential to damage several biological systems and pathways. The primary target is the central nervous system and the brain, but lead

## Lead Paint Terminology

As used in this booklet:

- “Paint” includes varnishes, lacquers, stains, enamels, glazes, primers, or coatings used for any purpose. Paint is typically a mixture of resins, pigments, fillers, solvents, and other additives.
- “Lead paint” is paint to which one or more lead compounds have been added.
- “Lead pigments” are lead compounds used to give a paint product its color.
- “Lead anti-corrosive agents” are lead compounds used to protect a metal surface from rusting or other forms of corrosion.
- “Lead driers” are lead compounds used to make paint dry more quickly and evenly.
- “Decorative paint” refers to paints that are produced for use on inside or outside walls, and surfaces 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.
- “Solvent-based, enamel decorative paint” or “enamel decorative paint” refers to oil-based paints.
- “ppm” means parts per million total lead content by weight in a dried paint sample. All lead concentrations in the report are total lead levels, unless otherwise specified.



can also affect the blood system, the kidneys, and the skeleton.<sup>[6]</sup> Lead is also categorized as an endocrine-disrupting chemical (EDC).<sup>[7]</sup>

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.<sup>[8]</sup>

According to the World Health Organization (WHO): “Lead has no essential role in the human body, and lead poisoning accounts for about 0.6 percent of the global burden of disease.”<sup>[2]</sup> Evidence of reduced intelligence caused by childhood exposure to lead has led 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.<sup>[9]</sup>

In recent years, medical researchers have been documenting significant health impacts in children from lower and lower levels of lead exposure.<sup>[2, 6]</sup> According to the factsheet on Lead Poisoning and Health from WHO: “There is no known level of lead exposure that is considered safe.”<sup>[10]</sup>

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.<sup>[11]</sup> 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.<sup>[2]</sup> 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\*\* per year.<sup>[12]</sup> 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 percent of Gross Domestic Product (GDP);

**Latin America and the Caribbean:** \$142.3 billion of economic loss, or 2.04 percent of GDP; and

**Asia:** \$699.9 billion of economic loss, or 1.88 percent of GDP.

Country estimates used in this study can be accessed at a publically available website, <http://www.med.nyu.edu/pediatrics/research/environmentalpediatrics/leadexposure>, and shows that *economic loss in The Gambia is estimated at \$150 million, or 3.96 percent of the country’s GDP.*

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\*\* 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.

## 1.2 THE USE OF LEAD IN PAINT

Paints contain high levels of 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. Leaded paint ingredients are most commonly intentionally used in solvent-based paint due to their chemical properties, and solvent-based paints have been found to have high lead content in many countries.<sup>[13-15]</sup>

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 may also be added to enamel paints for use as driers (sometimes called drying agents or drying 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) 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 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 e.g., the U.S., Cameroon, India, and Kenya is a total maximum lead content of 90 ppm, and adherence to this ensures that a manufacturer can sell its paint anywhere in the world. Some other countries such as Brazil, South Africa, and Sri Lanka have established standards of 600 ppm total lead.

## 1.3 PAINT MARKET AND REGULATORY FRAMEWORK IN THE GAMBIA

### ***1.3.1 The Gambia Paint Market Analysis***

The paint industry in the country is dominated by foreign companies that import their products into the country and holds the largest share of the paint market. However, there is no publicly available data regarding the percentage of market share that these companies hold.

National Paints by Menzar Company (G) LTD is the most popular paint distributor in the country and is the leading brand of paint found in all paint shops across the country. The two most popular paint companies in the country are the National Paints by Menzar Company (G) LTD and Sunu Kerr MFH Group. Foreign paint manufacturers bring in about 320,000 liters of paints per month.

The local paint industry is comprised of very small companies like Tinnin Paint Factory and Alpha Trading Enterprise owned by Gambians who only produce water-based paints in different types and colors. These companies are located in Kanifing Industrial estate.

Tinnin Paint Factory was established in 2009 but the company holds less than two percent of the paint market. It exclusively distributes its paint products in the local market.

Alpha Trading Enterprise is the manufacturer of Liwa Paints and it manufactures approximately 18,000 liters of paints per annum. The company also exports paints to neighboring countries such as Senegal and Sierra Leone.

Although the demand for paint is increasing due to the increased number of infrastructure projects in the country, the local paint companies still hold less market share. The main paint industry in the country is located in Kanifing, Jimpex Road.

### ***1.3.2 The Gambia Framework for Eliminating Lead Paint***

The Gambia has no paint regulation or existing laws that limit the manufacture, import, distribution, sale and use of paints that contain total lead concentrations exceeding 90 ppm.

Through its Hazardous Chemicals and Pesticides Management Program, the National Environment Agency is responsible for establishing standards on chemicals and other hazardous substances. The process involves drafting a Cabinet paper for approval by the Cabinet, consulting relevant stakeholders, sensitizing the public, and conducting a national interest analyses, and submitting to the Parliament. The Hazardous Chemicals and Pesticides Management Act is currently under review, which can be amended to include a regulation on lead in paint.

According to the Gambia Standards Bureau, a national standard on lead in paint shall be developed this year under the National Standardization Strategy Action Plan (2018-2020). Section 12 of the Consumer Protection Act 2014 states that, “Any false or misleading offer, promotion or advertising of goods or services shall be subject to investigation and prosecution.”

## 2. MATERIALS AND METHODS

From 18th to 27th December 2017, 39 cans of solvent-based paint intended for home use were purchased by YVE—The Gambia from various stores in Kanifing and Basse, The Gambia. The paints represented 11 different brands produced by 11 manufacturers, all of which were imported from Brazil, China, Lebanon, Morocco and the UAE.

In most cases, one white paint and one or more bright-colored paint such as red, orange, green or yellow were selected. Excluded were automotive and industrial paints that are not typically used for domestic housing applications.

During the paint sample preparation, information such as color, brand, manufacturer, country where manufactured, product codes, production dates, and other details as provided on the label of the paint can were recorded. Generic paint colors were recorded, e.g., “yellow” instead of “sunflower.” For all colored paints, the protocol called for obtaining “bright” or “strong” red and yellow paints when available.

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 YVE—The Gambia 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, labeled wood pieces using different unused, single-use paintbrushes by a researcher of YVE—The Gambia as shown in Figure 1.

Each stirring utensil and paintbrush was used only for the same paint, 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 individually labeled, resealable plastic bags and shipped for analysis of lead content to Forensic Analytical Laboratories, Inc. in the United States of America. The laboratory participates in the Environmental Lead Proficiency Analytical Testing (ELPAT) Program operated by the American Industrial Hygiene Association. In the laboratory selection process, IPEN further assessed the reliability of the laboratory results by conducting an independent quality assurance testing. This was made by sending paint samples with a known lead content to the laboratory, and evaluating the results received.



*Figure 1. Staff of YVE-The Gambia conducting sample preparation.*

The laboratory's lower limit of detection for the lead concentration in the paint samples is dependent on the amount of paint in the samples. Generally, the lowest detection limit for the method used is 60 ppm, but if only a small amount of paint is available, the detection limit increases. Therefore, the detection limit was higher (up to 800 ppm) for some of the samples.

The paint samples were analyzed using method EPA3050B/7000B, i.e., through acid digestion of the samples, followed by Flame Atomic Absorption Spectrometry, as recognized by WHO as appropriate for the purpose.<sup>[16]</sup>

# 3. RESULTS

## 3.1 SUMMARY OF RESULTS

This study shows that:

- Twenty-four out of 39 analyzed solvent-based paints (62 percent of paints) were lead paints, i.e., they contained lead concentrations above 90 parts per million (ppm), dry weight. In addition, 16 paints (41 percent of paints) contained dangerously high lead concentrations above 10,000 ppm.
- Nine out of 11 analyzed brands (82 percent of paint brands) sold at least one lead paint, i.e., a paint with lead concentration above 90 ppm. Also, nine out of 11 analyzed brands (82 percent of paint brands) sold at least one lead paint with dangerously high lead concentrations above 10,000 ppm.
- All 39 paints from 11 brands were imported to The Gambia.
- Twenty-two out of 27 bright-colored paints (81 percent of bright-colored paints) were lead paints, i.e., they contained lead concentrations above 90 parts per million (ppm), dry weight. Yellow paints were the most hazardous with nine out of 10 paints (90 percent of yellow paints) containing lead concentrations greater than 10,000 ppm; four out of five orange paints (80 percent of orange paints) and three out of 11 red paints (27 percent of red paints) also contained dangerously high lead concentrations above 10,000 ppm.
- The highest lead concentration detected was 100,000 ppm in two yellow paints sold for home use from the brands National and Oasis.
- Only eight out of 39 paints (21 percent of paints) provided information about lead on their labels and most paints carried little information about ingredients. Two Oasis enamel paints contained lead levels ranging from 6,000 ppm to 100,000 ppm despite markings on labels which says, “100% lead free;” one Oasis enamel paint contained 65,000 ppm lead despite a “no added lead” mark on its label; and three Pastel enamel paints contained lead levels ranging from 9,400 ppm to 42,000 ppm despite “lead free” claims on paint can labels. Most paints were merely labeled as “solvents, pigments and resin,” with no further details on the type of solvents and pigments (organic or inorganic) provided. Most warning symbols on the paint cans indicated the flammability of the paints, but no precautionary warnings on the effects of lead dust to children and pregnant women were provided.

### 3.2 LEAD CONTENT ANALYSIS

*Twenty-four out of 39 analyzed solvent-based paints (62 percent of paints) were lead paints, i.e., contained a lead concentration above 90 ppm —16 of these contained dangerously high lead concentrations above 10,000 ppm (41 percent of paints).*

Two yellow paints from the brands National and Oasis contained the highest concentration of lead at 100,000 ppm, while the lowest concentration of lead less than 60 ppm was detected in 11 paints from the following brands: Atlas Auto (white); Coral (orange, red, white and yellow); National (red and white); Oasis (white); Pastel (white); Regent (white); and Wellcoat (white).

The ten solvent-based paints with the highest amounts of lead are summarized in Table 1.

**TABLE 1.** TOP 10 SOLVENT-BASED PAINTS WITH THE HIGHEST LEAD CONTENT.

Rank	Sample No.	Brand	Country of Manufacturer	Color	Lead Content (ppm)
1	GAM-03	National	National Paints Factories Co. LTD (UAE)	yellow	100,000
	GAM-11	Oasis	AI GURG Paints LLC (UAE)	yellow	100,000
3	GAM-33	Aodaline	Aodaline Colours Paint (China)	yellow	81,000
4	GAM-10	Oasis	AI GURG Paints LLC (UAE)	orange	65,000
5	GAM-28	Atlas Auto	B.H.F. Casablanca (Morocco)	yellow	63,000
6	GAM-01	National	National Paints Factories Co. LTD (UAE)	orange	52,000
7	GAM-06	Wellcoat	Well Coat Paints (UAE)	yellow	45,000
8	GAM-36	Ritver Spray Paint	Ritver Paints and Coatings (UAE)	yellow	44,000
9	GAM-18	Pastel	Harfouche for Trading and Industry Est. (Lebanon)	orange	42,000
10	GAM-19	Pastel	Harfouche for Trading and Industry Est. (Lebanon)	yellow	41,000
	GAM-25	Ritver	Ritver Paints and Coatings (UAE)	red	41,000

### 3.3 PAINT BRAND ANALYSIS

***Nine out of 11 analyzed brands (82 percent of paint brands) sold at least one paint with dangerously high lead concentration above 10,000 ppm.***

Two yellow solvent-based decorative paints from the brands National and Oasis contained the highest concentration of lead at 100,000 ppm. On the other hand, at least one paint from each of the following brands contained lead below 90 ppm: Atlas Auto (white); Coral (orange, red, white and yellow); National (red and white); Oasis (white); Pastel (white); Regent (white); and Wellcoat (white). These paints were manufactured in Brazil, Lebanon, Morocco and UAE. This indicates that the technology to produce paints without added lead exists in these countries.

### 3.4 PAINT COLOR ANALYSIS

***Twenty-two out of 27 bright-colored paints (81 percent of bright-colored paints) such as yellow, orange, green and red contained lead concentrations above 90 ppm, 16 paints of which contained dangerously high lead concentrations above 10,000 ppm (59 percent of bright-colored paints).***

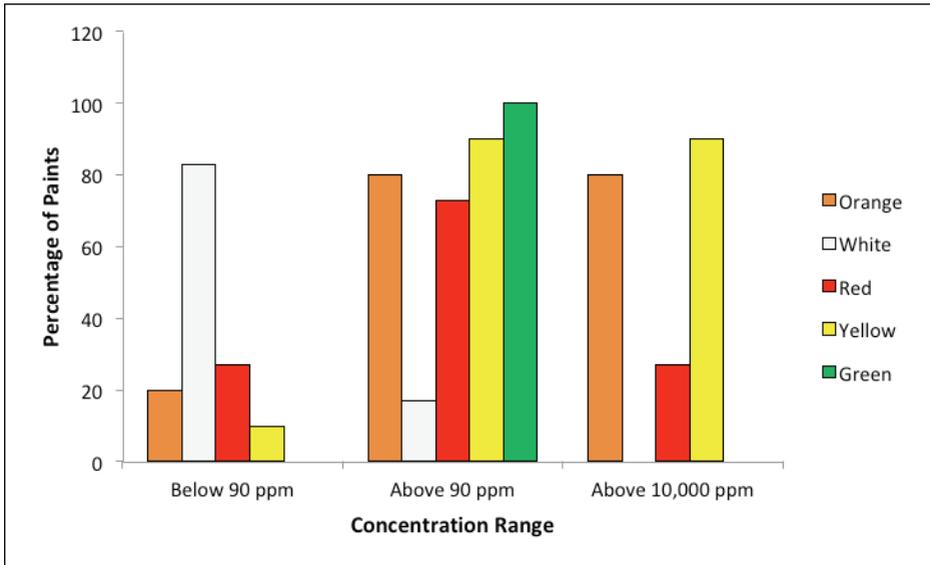
This study included 12 white paints, 11 red paints, 10 yellow paints, five orange paints and one green paint. Yellow, orange and red paints contained the highest lead concentrations.

Among bright-colored paints, nine out of 10 yellow paints (90 percent of yellow paints) contained lead concentrations above 90 ppm, all nine paints of which exceeded more than 10,000 ppm of lead. Four out of five orange paints (80 percent of orange paints) contained lead concentrations above 90 ppm, all four paints of which exceeded more than 10,000 ppm of lead. Eight out of 11 red paints (73 percent of red paints) contained lead concentrations above 90 ppm, three paints of which exceeded more than 10,000 ppm of lead (27 percent of red paints).

The distribution of lead concentrations in different colors is shown in Figure 2.

### 3.5 LABELING

***In general, most paint can labels did not carry meaningful information about lead content or the hazards of lead paint. In addition, six paints with “lead free” or “no added lead” claims contained high levels of lead up to 100,000 ppm.***



**Figure 2. Distribution of Lead Concentrations in New Solvent-based Paints by Color.**

Only eight out of 39 paints (21 percent of paints) provided information about lead on their labels and most paint can labels carried little information about any ingredients. Two Oasis enamel paints contained lead levels ranging from 6,000 ppm to 100,000 ppm despite markings on labels which says, “100% lead free;” one Oasis enamel paint contained 65,000 ppm lead despite a “no added lead” mark on its label; and three Pastel enamel paints contained lead levels ranging from 9,400 ppm to 42,000 ppm despite “lead free” claims on paint can labels.

Most paints were merely labeled as “solvents, pigments and resin,” with no further details on the type of solvents and pigments (organic or inorganic) provided on paint can labels. Manufacturing dates were included on the labels of 24 out of 39 paints (62 percent of paints) included in this study and batch numbers were included on the labels of 15 out of 39 paints (38 percent of paints) included in this study. Most warning symbols on the paint cans indicated the flammability of the paints, but no precautionary warnings on the effects of lead dust to children and pregnant women were provided.

# 4. CONCLUSIONS AND RECOMMENDATIONS

This study demonstrates that solvent-based paints for home use with high concentrations of lead are widely available in The Gambia since the paints sampled for this study are brands commonly sold in retail stores all over the country. Since all paints were imported from other countries, it is very important to establish import controls to ensure that paints coming into The Gambia do not contain lead. It is also important that these paints be subjected to independent verifications given the prevalence of paints with “lead free” claims containing very high lead levels. The study results provide a strong justification to adopt and enforce a regulation that will ban the manufacture, import, export, distribution, sale and use of paints with total lead concentrations greater than 90 ppm.

To address the problem of lead in paint, the YVE-The Gambia and IPEN propose the following recommendations:

### ***Government and Government Agencies***

The National Environment Agency should immediately draft a regulation which will be added to the existing Hazardous Chemicals and Pesticides Management Act that will ban the manufacture, import, export, distribution, sale and use of paints that contain total lead concentrations exceeding 90 ppm, the most restrictive standard in the world. According to the Gambia Standards Bureau, a national standard on lead in paint shall be developed this year under the National Standardization Strategy Action Plan (2018-2020). The Ministry in charge of Trade and Industry should also require paint companies to display sufficient information indicating harmful content on paint can labels such as solvents and provide a warning on possible lead dust hazards when disturbing painted surfaces. Given that a number of paint brands with “lead free” claims were found to contain very high lead levels, the Ministry of Trade and Industry should penalize paint manufacturers engaged in such misleading advertisements. Section 12 of the Consumer Protection Act 2014 states that, “Any false or misleading offer, promotion or advertising of goods or services shall be subject to investigation and prosecution.”

### ***Paint Industry***

For paint companies that still produce lead paints to expeditiously stop the use of leaded paint ingredients in paint formulations. Paint companies that have shifted to non-lead paint production should get their products certified through independent, third party verification procedures to increase the customer's ability to choose paints with no added lead.

### ***Paint Factories, Importers and Distributors***

Paint distributors that import lead paints for sale in the country should only import and sell paints independently verified to be produced without lead to influence the paint industry to shift to non-lead paint production. Paint factories that also import raw materials for the production of paints should stop importing leaded paint ingredients.

### ***Individual, Household and Institutional Consumers***

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

### ***Organizations and Professional Groups***

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

### ***All stakeholders***

For all stakeholders to come together and unite in promoting a strong policy that will eliminate lead paint in The Gambia.

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# APPENDIX

**TABLE 2.** SOLVENT-BASED PAINTS FOR HOME USE INCLUDED IN THE STUDY.

Sample No.	Brand	Color	Volume (L)	Price (Gambian Dalasi)	Date of Manufacture (y/m/d)	Batch No.	Date of Purchase (y/m/d)	Is there website on label?
GAM-01	National	orange	1	200	Not given	Not given	2017/12/18	www.national-paints.com
GAM-02	National	red	1	200	Not given	Not given	2017/12/18	www.national-paints.com
GAM-03	National	yellow	0.5	100	Not given	Not given	2017/12/18	www.national-paints.com
GAM-04	National	white	0.5	100	Not given	Not given	2017/12/18	www.national-paints.com
GAM-05	Wellcoat	red	1	250	Not given	31031A17	2017/12/18	www.wellcoatpaints.com
GAM-06	Wellcoat	yellow	1	250	Not given	33336E17	2017/12/18	www.wellcoatpaints.com
GAM-07	Wellcoat	white	1	250	Not given	33287E17	2017/12/18	www.wellcoatpaints.com
GAM-08	Wellcoat	orange	3.6	650	Not given	6020625C6	2017/12/18	www.wellcoatpaints.com
GAM-09	Oasis	red	1	250	2016/02	F1301557	2017/12/18	www.aglplus.com
GAM-10	Oasis	orange	3.6	650	2012/12	F1183998	2017/12/18	www.aglplus.com
GAM-11	Oasis	yellow	1	250	2016/02	F1301693	2017/12/18	www.aglplus.com
GAM-12	Oasis	white	1	250	2017/07	F1352949	2017/12/18	www.aglplus.com
GAM-13	Coral	white	1	250	Not given	Not given	2017/12/18	www.coral.com.br
GAM-14	Coral	red	1	250	Not given	Not given	2017/12/18	www.coral.com.br
GAM-15	Coral	yellow	1	250	Not given	Not given	2017/12/18	www.coral.com.br
GAM-16	Coral	orange	3.6	650	Not given	Not given	2017/12/18	www.coral.com.br
GAM-17	Pastel	red	1	210	2017/06	107440	2017/12/18	No
GAM-18	Pastel	orange	1	210	2016/10	103754	2017/12/18	No
GAM-19	Pastel	yellow	1	210	2015/06	94802	2017/12/18	No
GAM-20	Pastel	white	1	210	2015/11	102974	2017/12/18	No
GAM-21	Regent	white	3.6	650	2008	Not given	2017/12/18	www.matawala.com
GAM-22	Regent	green	3.6	650	2008	Not given	2017/12/18	www.matawala.com

Sample No.	Brand	Color	Volume (L)	Price (Gambian Dalasi)	Date of Manufacture (y/m/d)	Batch No.	Date of Purchase (y/m/d)	Is there website on label?
GAM-23	Regent	red	3.6	650	2008	Not given	2017/12/18	www.matawala.com
GAM-24	Ritver	yellow	3.6	750	2017/09/05	1709-009	2017/12/27	www.ritver.com
GAM-25	Ritver	red	3.6	750	2017/09/09	1709-050	2017/12/27	www.ritver.com
GAM-26	Ritver	white	3.6	750	2017/08/30	1708-1000	2017/12/27	www.ritver.com
GAM-28	Atlas Auto	yellow	85 g	50	Not given	Not given	2017/12/22	No
GAM-29	Atlas Auto	white	85 g	50	Not given	Not given	2017/12/22	No
GAM-30	Atlas Auto	red	85 g	50	Not given	Not given	2017/12/22	No
GAM-31	Aodaline	white	0.4	75	2017/06/03	Not given	2017/12/27	No
GAM-32	Aodaline	red	0.4	75	2017/06/03	Not given	2017/12/27	No
GAM-33	Aodaline	yellow	0.4	75	2017/06/03	Not given	2017/12/27	No
GAM-34	Ritver Spray Paints	white	0.4	150	2017/07/11	Not given	2017/12/27	www.ritver.com
GAM-35	Ritver Spray Paints	red	0.4	150	2017/07/11	Not given	2017/12/27	www.ritver.com
GAM-36	Ritver Spray Paints	yellow	0.4	150	2017/07/11	Not given	2017/12/27	www.ritver.com
GAM-37	All Purpose	white	0.4	70	2015/04/25	Not given	2017/12/22	No
GAM-38	All Purpose	red	0.4	70	2017/04/06	Not given	2017/12/22	No
GAM-39	All Purpose	yellow	0.4	70	2017/04/06	Not given	2017/12/22	No
GAM-40	Deer	white	0.4	70	2015/07/31	Not given	2017/12/22	No

**TABLE 3.** RESULTS OF LABORATORY ANALYSIS OF SOLVENT-BASED PAINTS FOR HOME USE.

Sample No.	Brand	Color	Lead Content, Dry Weight (ppm)	Country of Brand Headquarters	Country of Manufacture	Is there information on can about lead content of paint?
GAM-01	National	orange	52,000	UAE	UAE	No
GAM-02	National	red	< 60	UAE	UAE	No
GAM-03	National	yellow	100,000	UAE	UAE	No
GAM-04	National	white	< 60	UAE	UAE	No
GAM-05	Wellcoat	red	4,300	UAE	UAE	No
GAM-06	Wellcoat	yellow	45,000	UAE	UAE	No
GAM-07	Wellcoat	white	< 60	UAE	UAE	No
GAM-08	Wellcoat	orange	15,000	UAE	UAE	No
GAM-09	Oasis	red	6,000	UAE	UAE	"100% lead free"
GAM-10	Oasis	orange	65,000	UAE	UAE	"No added lead"
GAM-11	Oasis	yellow	100,000	UAE	UAE	"100% lead free"
GAM-12	Oasis	white	< 60	UAE	UAE	"100% lead free"
GAM-13	Coral	white	< 60	Netherlands	Brazil	No
GAM-14	Coral	red	< 60	Netherlands	Brazil	No
GAM-15	Coral	yellow	< 60	Netherlands	Brazil	No
GAM-16	Coral	orange	< 60	Netherlands	Brazil	No
GAM-17	Pastel	red	9,400	Lebanon	Lebanon	"lead free"
GAM-18	Pastel	orange	42,000	Lebanon	Lebanon	"lead free"
GAM-19	Pastel	yellow	41,000	Lebanon	Lebanon	"lead free"
GAM-20	Pastel	white	< 60	Lebanon	Lebanon	"lead free"
GAM-21	Regent	white	< 60	USA	UAE	No
GAM-22	Regent	green	1,000	USA	UAE	No
GAM-23	Regent	red	14,000	USA	UAE	No
GAM-24	Ritver	yellow	30,000	UAE	UAE	No
GAM-25	Ritver	red	41,000	UAE	UAE	No
GAM-26	Ritver	white	1,100	UAE	UAE	No

<b>Sample No.</b>	<b>Brand</b>	<b>Color</b>	<b>Lead Content, Dry Weight (ppm)</b>	<b>Country of Brand Headquarters</b>	<b>Country of Manufacture</b>	<b>Is there information on can about lead content of paint?</b>
GAM-28	Atlas Auto	yellow	63,000	Morocco	Morocco	No
GAM-29	Atlas Auto	white	< 60	Morocco	Morocco	No
GAM-30	Atlas Auto	red	140	Morocco	Morocco	No
GAM-31	Aodaline	white	< 800	China	China	No
GAM-32	Aodaline	red	< 600	China	China	No
GAM-33	Aodaline	yellow	81,000	China	China	No
GAM-34	Ritver Spray Paints	white	< 300	UAE	UAE	No
GAM-35	Ritver Spray Paints	red	26,000	UAE	UAE	No
GAM-36	Ritver Spray Paints	yellow	44,000	UAE	UAE	No
GAM-37	All Purpose	white	< 300	UAE	UAE	No
GAM-38	All Purpose	red	< 200	UAE	UAE	No
GAM-39	All Purpose	yellow	15,000	UAE	UAE	No
GAM-40	Deer	white	< 200	China	China	No

**TABLE 4.** DISTRIBUTION OF LEAD CONCENTRATION BY BRAND.

<b>Brand</b>	<b>No. of Samples</b>	<b>No. of Samples Above 90 ppm</b>	<b>No. of Samples Above 10,000 ppm</b>	<b>Minimum Lead Content (ppm)</b>	<b>Maximum Lead Content (ppm)</b>
National	4	2	2	< 60	100,000
Wellcoat	4	3	2	< 60	45,000
Oasis	4	3	2	< 60	100,000
Pastel	4	3	2	< 60	42,000
Coral	4	0	0	< 60	< 60
Regent	3	2	1	< 60	14,000
Ritver	6	5	4	< 300	44,000
Atlas Auto	3	2	1	< 60	63,000
Aodaline	3	3	1	< 600	81,000
All Purpose	3	1	1	< 200	15,000
Deer	1 (white)	0	0	< 200	< 200

**TABLE 5.** DISTRIBUTION OF LEAD CONCENTRATION BY COLOR.

<b>Color</b>	<b>No. of Samples</b>	<b>No. of Samples Above 90 ppm</b>	<b>No. of Samples Above 10,000 ppm</b>	<b>Minimum Lead Content (ppm)</b>	<b>Maximum Lead Content (ppm)</b>
White	12	2	0	< 60	1,100
Yellow	10	9	9	< 60	100,000
Orange	5	4	4	< 60	65,000
Red	11	8	3	< 60	41,000
Green	1	1	0	1,000	1,000



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