REGIONAL REPORT

# LEAD IN SOLVENT-BASED PAINTS FOR HOME USE IN AFRICA

October 2017

SWEDEN

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- Centre de Recherche et d'Education pur le Developpement (CREPD), Cameroon
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While these studies and this publication has been produced with the assistance of the GEF, NYCT, the Swedish Government, and other donors, responsibility for the content lies entirely with IPEN and its NGO partners. The GEF, NYCT, the Swedish Government, and other donors do not necessarily share the expressed views and interpretations.

Established in 1998, IPEN is currently comprised of over 500 Participating Organizations

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in 116 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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# PREFACE

Studies conducted earlier in a number of countries (for example, Côte d'Ivoire, Ethiopia and Kenya) suggested that many paints with high lead content are widely available for sale in Africa. However, these previous studies were conducted in a limited number of countries and were not sufficient to provide a comprehensive picture of the extent to which lead paints continue to be sold in Africa.

Therefore, new studies were undertaken from June 2016 to July 2017 with a goal of gathering new data on the lead content of solvent-based household paints available on the market in Benin, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Guinea, Kenya, Morocco, Mozambique, Nigeria, Sudan, Tanzania, Togo, Uganda and Zambia, especially paints made by small- and medium-sized paint manufacturers (SMEs).

This report presents these new data on the total lead content of solvent-based paints for home use available on the market in these 15 countries. 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 it provides a strong justification for adopting and enforcing further regulatory controls in these countries. Finally, it proposes action steps by different stakeholders to protect children and others from lead paint.

IPEN is an international NGO network of health and environmental organizations from all regions of the world. The NGO partners from the 15 countries included in this study are all IPEN participating organizations. 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.

# 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, with health effects that are generally irreversible and 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.

Even small amounts of lead can harm a child's nervous system, making it more likely that the child will have difficulties in school and engage in impulsive and violent behavior. Lead exposure in young children has been linked to increased rates of hyperactivity, inattentiveness, failure to graduate from high school, conduct disorder, juvenile delinquency, drug use, and incarceration. The economic cost of childhood lead exposure in low- and middle-income countries is estimated at a total cumulative cost burden of $977 billion international dollars. In the African region, the economic loss is estimated at $134 billion international dollars, or 4.03 percent of the entire region's Gross Domestic Product (GDP).

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. However, more than 100 lead paint studies in 55 countries over the last

nine years show that lead paints are still widely sold in low- and middle-income countries, and many paints still contain very high levels of lead.

From June 2016 to July 2017, a total of 593 cans of solvent-based paint intended for home use were purchased at paint retailers in Benin, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Guinea, Kenya, Morocco, Mozambique, Nigeria, Sudan, Tanzania, Togo, Uganda and Zambia. The paints represented over 180 different brands produced by more than 150 manufacturers. 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

While results varied between countries, the overall picture was clear: lead paint is still widely available in African countries.

### *Most of the paints analyzed contained high levels of lead*

More than half of all 593 analyzed solvent-based paints for home use (55 percent of paints) contained lead concentrations above 90 parts per million (ppm, dry weight of paint). These paints would not be permitted for sale in a number of countries where a 90 ppm regulatory limit for lead in decorative paint is in force, including Cameroon, India (effective November 2018), Nepal, Philippines, and the United States of America.

### *Many paints contained very high levels of lead*

In total, 144 of the 593 paints analyzed (24 percent of paints) contained dangerously high lead concentrations above 10,000 ppm. However, the percentage of paints included in the study with a lead content above 10,000 varied substantially between countries from zero percent in Guinea to 54 percent in Nigeria.

Furthermore, 22 paints from nine countries contained extremely high lead levels of 100,000 ppm or more.

### *Bright-colored paints contain much higher levels of lead*

The lead content of analyzed paints varied depending on color, and bright-colored paints such as yellow, red, orange and green generally contained much

higher levels of lead than white paints or dark-colored paints, e.g., blue, brown, grey and black.

### *Several market-leading brands contained very high levels of lead*

Many paint brands manufactured by market leading manufacturers in 12 out of 15 countries contained very high lead levels above 10,000 ppm up to extremely high lead levels greater than 100,000 ppm. Most of these brands were locally-manufactured, but some paints were imported from Europe, the Middle East, and other African countries.

### *Lead-free paints are available on the market*

A considerable number of analyzed paints (45 percent of paints) contained lead levels below 90 ppm, suggesting that paints without added lead were readily available on the market in all countries.

### *Consumer information is lacking on paint cans*

Few paints in the studies included information about any ingredients on paint can labels. Moreover, very few lead-containing paint can labels indicated the presence of lead, and none of the paint can labels provided precautionary warnings on the effects of lead dust to children and pregnant women.

### *Third-party certification is needed to guarantee "lead-free" claims on paint cans*

Labels on 21 paint cans included claims from the manufacturer that these paints do not contain lead. However, five of these paints contained levels of lead greater than 90 ppm ranging from 110 ppm to 160,000 ppm. Therefore, an independent, third-party certification is necessary to establish the credibility of such claims.

## RECOMMENDATIONS

### *International Agencies*

- Ensure that reliable data on the lead content of paints sold in African markets is generated and made publicly available to aid in the enactment of any meaningful and enforceable regulatory controls on the lead content of paints.
- Provide concrete guidance to individual governments seeking assistance in establishing regulatory controls on lead in paint to ensure that the standards and regulations enacted are protective of human health.

- Support the development of in-country laboratory capacity to analyze paint samples for lead content.

### *National Governments*

- Take immediate steps to begin developing lead paint regulations for all types of paint to support the Global Alliance to Eliminate Lead Paint (GAELP) in its goal for all countries to enact regulatory controls on lead in paint by 2020.
- For countries with draft regulations in place, fast track approval to 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.
- Hold multi-stakeholder consultations to address how the controls will be formulated and the time line for their entry into force.
- Ensure that monitoring and enforcement measures are included in lead paint regulations.
- 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.

### *Paint Industry*

- Take immediate, voluntary action to eliminate lead in all paint formulations, with decorative and other paints used in and around homes and schools as a priority.
- Commit to third-party certification to ensure that claims of no added lead can be independently verified and trusted
- Implement measures to safeguard industry workers and painters from lead exposure.

### *Individual, Household and Institutional Consumers*

- Read paint can labels and demand paints with no added lead from paint manufacturers and retailers, as well as full disclosure of a paint product's content.
- Ask for, 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.

### *Public Health Groups, Consumer Organizations and Other Concerned Entities*

- Support policy initiatives that seek to eliminate lead paint.
- 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*

- Come together and unite in promoting a strong policy that will eliminate lead paint in all of Africa.
- Get involved and participate in the annual International Lead Poisoning Prevention Week of Action to highlight the hazards of lead, usually observed every fourth week of October.

# 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 process releases lead to dust and soil. Lead dust is also produced, when a surface previously painted with lead paint is sanded or scraped in preparation for repainting, which also can constitute a severe health hazard.[1]

Children playing indoors or outdoors get house dust or soil on their hands, and then ingest it through normal hand-to-mouth behavior. If the 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.[2]

In some cases, children pick up paint chips and put them directly into their mouths. This can be especially harmful because the lead content of 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.[3]

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.[2]

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.[4] Lead is also transferred through breast milk when lead is present in a nursing mother.[5]

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

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.[8]

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."[2] 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.[9]

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

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.[11] 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.[2] 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.

## 1.2 ECONOMIC IMPACTS OF LEAD EXPOSURE

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.[12] 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.

* 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.

Broken down by region, the economic burden of childhood lead exposure, calculated in International Dollar, as estimated by this study was:

**Africa:** $134.7 billion of economic loss, or 4.03 percent of Gross Domestic Product (GDP);

**Asia:** $699.9 billion of economic loss, or 1.88 percent of GDP; and

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

Country estimates can be accessed at a publicly available website. Looking only at the countries included in this study, the estimated economic burden of childhood lead exposure is:

- **Benin:** $861 million of economic loss, or 5.81 percent of GDP;
- **Cameroon:** $2.52 billion of economic loss, or 5.28 percent of GDP;
- **Côte d'Ivoire:** $1.76 billion of economic loss, or 4.85 percent of GDP;
- **Egypt:** $17.8 billion of economic loss, or 3.41 percent of GDP;
- **Ethiopia:** $4.47 billion of economic loss, or 4.73 percent of GDP;
- **Guinea:** $671 million of economic loss, or 5.82 percent of GDP;
- **Kenya:** $3.76 billion of economic loss, or 5.26 percent of GDP;
- **Morocco:** $5.65 billion of economic loss, or 3.45 percent of GDP;
- **Mozambique:** $1.35 billion, or 5.76 percent of GDP;
- **Nigeria:** $16.2 billion, or 3.94 percent of GDP;
- **Sudan:** $4.94 billion, or 5.17 percent of GDP;
- **Tanzania:** $4.14 billion, or 6.06 percent of GDP;
- **Togo:** $319 million, or 4.98 percent of GDP;
- **Uganda:** $3.54 billion, or 7.58 percent of GDP; and
- **Zambia:** $1.44 billion, or 6.59 percent of GDP.

## 1.3 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

## 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.

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.[13-15]

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 a total of 90 parts per million (ppm) lead by dry weight, and frequently 10 ppm or less.

## 1.4 POLICY FRAMEWORKS FOR ELIMINATING LEAD PAINT

An international convention limiting the use of white lead in interior paints was adopted by the General Conference of the International Labour Organization as early as 1921 and ratified by 63 countries.[16] 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, for example, the U.S., the Philippines, Nepal, India and Cameroon, 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.

Limiting the use of lead in decorative paint may also be aided by voluntary schemes such as third-party certification and labeling programs. An example of such a scheme is the Lead Safe Paint® certification program,** an independent, third-party certification program that verifies paints contain less than 90 parts per million (ppm) total lead (dry weight). This limit was chosen based on the strictest mandatory regulatory standard for lead content in paint anywhere in the world. When the adherence to this limit has been verified, participating companies are allowed to place the Lead Safe Paint® certification mark on their paints indicating that the paint does not contain added lead compounds.

** More information is available at www.leadsafepaint.org.

Consumer groups and other concerned entities jointly work with participating companies to encourage consumers to look for this mark when selecting paints.

## INTERNATIONAL FRAMEWORK FOR LEAD PAINT ELIMINATION

At the second session of the International Conference on Chemicals Management (ICCM2), held in 2009, several chemical issues were identified by consensus to be international priority issues of concern. One of these issues was lead in paint, and there followed a decision to establish lead in paint as an international emerging policy issue.[17] In response to the ICCM2 decision, the United Nations Environment Programme (UNEP) and the World Health Organization (WHO) jointly initiated a global partnership to eliminate the use of lead compounds in paints in order to protect public health and the environment. This partnership is called the Global Alliance to Eliminate Lead Paint (GAELP). GAELP's broad objective is to phase out the manufacture and sale of paints containing lead and eventually to eliminate the risks from such paint.***

## AFRICAN POLICY FRAMEWORKS FOR LEAD PAINT ELIMINATION

Very few countries in Africa regulate the lead content in decorative paints. South Africa has adopted binding, regulatory controls limiting lead in decorative paint to 600 ppm. Zimbabwe and Algeria have regulations limiting the lead content of paint, but the standards in these countries—10,000 ppm in Zimbabwe and 5,000 ppm in Algeria—are not health protective.[18] Cameroon enacted a regulation amending Prime Minister's Decree No. 2011/2581 on toxic chemical substances on September 21, 2017, which bans the manufacture, importation and marketing of paints containing more than a total of 90 ppm lead. Legally binding standards based on a total 90 ppm maximum limit on the lead content of paint are also underway in Ethiopia, Kenya and Tanzania.

In May 2016, the East African Community (EAC) adopted a 100 ppm lead limit in new standards for various types of paint, as measured by migration of lead from the paint. This is legally binding for its six member states (Burundi, Kenya, Rwanda, South Sudan, Tanzania and Uganda). To adhere to the most stringent limits today, plans are underway to propose amendments revising the standards to include a total lead limit of 90 ppm.

Government delegates from Kenya and Tanzania participating in the East Asia Workshop on the Development of National and Regional Regulations and Standards on Lead in Paints organized by the United Nations Environment

*** More information about GAELP can be found at UN Environment's web page: http://www.unep.org/chemicalsandwaste/what-we-do/technology-and-metals/lead/global-alliance-eliminate-lead-paint.

in September 2016 agreed to work to justify a revision of this limit to 90 ppm, measured as total lead content.

In September 2016, the Tanzania Bureau of Standards announced that Tanzania plans, over the next four years, to remove all paints with lead substances from the market.

IPEN is currently collaborating with NGOs and government officials in at least 15 African countries on efforts to establish regulatory controls, with funding from the GEF, NYCT, the Swedish Government, and other donors, and with support from UN Environment and other GAELP partners.

Lead paint regulations are now under active consideration by the governments of Côte d'Ivoire, Ethiopia, Kenya and Tanzania. Government from these and 15 other African countries (Benin, Burundi, Democratic Republic of the Congo, Ghana, Guinea, Malawi, Morocco, Nigeria, Rwanda, Senegal, Sudan, Togo, Tunisia, Uganda and Zambia) participated in UN Environment-sponsored capacity-building workshops in 2015 and 2016, and all agreed to cooperate to phase out the use of lead in paint by 2020. These government delegates also agreed that African countries should adopt a total lead limit of 90 ppm for all paints.

# 2. MATERIALS AND METHODS

From June 2016 to July 2017, a total of 593 cans of solvent-based paint intended for home use were purchased at paint retailers in Benin, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Guinea, Kenya, Morocco, Mozambique, Nigeria, Sudan, Tanzania, Togo, Uganda and Zambia. The paints represented over 180 different brands produced by more than 150 manufacturers.

In most cases, one white paint and one or more bright-colored paint such as green, orange, red or yellow were selected. Additionally, 36 anticorrosive paints purchased in Cameroon, Côte d'Ivoire, Egypt, and Morocco were also included

***Paint sample preparation by IPEN partner NGOs in Africa.***

in this study. The availability of these paints in retail establishments suggested that they were intended to be used within home environments. 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 IPEN partner organizations 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. 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.

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.

The paint samples were analyzed using method EPA3050B/7000B, i.e., through acid digestion of the samples, followed by Flame Atomic Absorption Spectrometry, which is recognized by the WHO as the appropriate lead content analysis process for this purpose.[19] This and other verification procedures conducted ensures reliability of the analytical results.

# 3. RESULTS

A total of 593 cans of solvent-based paints for home use were purchased in retail establishments in the following 15 countries: Benin, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Guinea, Kenya, Morocco, Mozambique, Nigeria, Sudan, Tanzania, Togo, Uganda and Zambia. All paints were analyzed for their total lead content, dry weight.

The countries selected for paint studies are regionally and linguistically diverse, and more than half did not have publicly available data on the lead content of decorative paints. In fact, this is the first study on lead content of paints ever conducted in the following eight countries: Benin, Guinea, Morocco, Mozambique, Sudan, Togo and Zambia.

The overall results are summarized in Table 1.

**TABLE 1.** SUMMARY OF RESULTS FROM NEW AFRICAN PAINTS STUDIES.

| Country | Number of Paints | Number of Brands | Percentage of Samples Above 90 ppm, % (Number) | Percentage of Samples Above 10,000 ppm, % (Number) | Minimum Lead Content, ppm | Maximum Lead Content, ppm |
|---|---|---|---|---|---|---|
| Benin | 28 | 10 | 79 (22) | 36 (10) | < 60 | 180,000 |
| Cameroon | 65 | 23 | 43 (28) | 15 (10) | < 60 | 220,000 |
| Côte d'Ivoire | 51 | 21 | 63 (32) | 27 (14) | < 60 | 470,000 |
| Egypt | 58 | 17 | 62 (36) | 3 (2) | < 60 | 43,000 |
| Ethiopia | 36 | 11 | 75 (27) | 42 (15) | < 60 | 100,000 |
| Guinea | 18 | 4 | 28 (5) | 0 (0) | < 60 | 9,700 |
| Kenya | 51 | 21 | 69 (35) | 33 (17) | < 60 | 160,000 |
| Morocco | 33 | 16 | 39 (13) | 18 (6) | < 60 | 140,000 |
| Mozambique | 32 | 8 | 25 (8) | 12 (4) | < 60 | 25,000 |
| Nigeria | 54 | 18 | 74 (40) | 54 (29) | < 60 | 160,000 |
| Sudan | 25 | 9 | 64 (16) | 28 (7) | < 60 | 71,000 |
| Tanzania | 46 | 12 | 46 (21) | 22 (10) | < 60 | 84,000 |
| Togo | 27 | 12 | 30 (8) | 7 (2) | < 60 | 42,000 |
| Uganda | 30 | 14 | 67 (20) | 37 (11) | < 60 | 150,000 |
| Zambia | 39 | 13 | 36 (14) | 18 (7) | < 60 | 120,000 |
| **Total** | **593** | **209** | **55 (325)** | **24 (144)** | - | - |

Most of the paints analyzed would not meet regulatory standards established in highly industrial countries

More than half of all 593 analyzed solvent-based paints for home use (55 percent of paints) contained lead concentrations above 90 parts per million (ppm, dry weight of paint). These paints would not be permitted for sale in countries such as the United States of America, Canada, Philippines, Nepal and India (India's regulation will take effect November 2018) where a 90 ppm regulatory limit for lead in decorative paint was adopted.

## PAINTS WITH EXTREMELY HIGH LEVELS OF LEAD ARE STILL AVAILABLE IN MOST COUNTRIES

In total, 144 of the 593 paints analyzed (24 percent of paints) contained dangerously high lead concentrations above 10,000 ppm. However, the percentage of paints included in the study with a lead content above 10,000 varied substantially between countries from zero percent in Guinea to 54 percent in Nigeria.

In nine out of 15 countries, at least one paint contained extremely high lead levels of 100,000 ppm or more. Overall, 22 paints contained lead levels above 100,000 ppm.

## LEAD CONCENTRATIONS IN PAINTS BY COLOR

When available, one white and one or more bright-colored paint such as yellow and red, orange and green were analyzed from each brand. Colors such as yellow and red were primarily selected, but other colors such as orange, green and blue were chosen if the first choices were not available. In some cases, several bright colors from the same brand were analyzed. Of the 593 paints analyzed, 185 were red (31 percent of paints), 164 were yellow (28 percent of paints), 159 were white (27 percent of paints), 35 were green (6 percent of paints), 20 were orange (3 percent of paints), 10 were blue (2 percent of paints), 10 were grey (2 percent of paints), five were brown (1 percent of paints), and five were black (1 percent of paints).

**TABLE 2:** LEAD CONTENT OF WHITE PAINTS.

| Country | Number of Paints | Percentage of Samples Above 90 ppm, % (Number) | Percentage of Samples Above 10,000 ppm, % (Number) | Minimum Lead Content, ppm | Maximum Lead Content, ppm |
|---|---|---|---|---|---|
| Benin | 1 | 0 (0) | 0 (0) | < 60 | < 60 |
| Cameroon | 7 | 0 (0) | 0 (0) | < 60 | < 200 |
| Côte d'Ivoire | 15 | 33 (5) | 0 (0) | < 60 | 4,500 |
| Egypt | 20 | 60 (12) | 0 (0) | < 60 | 470 |
| Ethiopia | 9 | 56 (5) | 0 (0) | < 60 | 6,300 |
| Guinea | 3 | 0 (0) | 0 (0) | < 60 | 70 |
| Kenya | 19 | 47 (9) | 0 (0) | < 60 | 6,300 |
| Morocco | 8 | 12 (1) | 0 (0) | < 60 | 960 |
| Mozambique | 8 | 12 (1) | 0 (0) | < 60 | 4,100 |
| Nigeria | 18 | 50 (9) | 6 (1) | < 60 | 80,000 |
| Sudan | 8 | 50 (4) | 0 (0) | < 60 | 3,300 |
| Tanzania | 12 | 8 (1) | 0 (0) | < 60 | 2,500 |
| Togo | 10 | 30 (3) | 0 (0) | < 60 | 560 |
| Uganda | 10 | 20 (2) | 0 (0) | < 60 | 5,600 |
| Zambia | 11 | 0 (0) | 0 (0) | < 60 | < 60 |
| **Total** | **159** | **33 (52)** | **0.63 (1)** | **< 60** | **80,000** |

White paints contained the lowest amount of lead. Of all the 159 white paints analyzed, 33 percent contained lead levels greater than 90 ppm, and 0.6 percent had lead levels greater than 10,000 ppm.

Apart from one white paint from Nigeria, which contains 80,000 ppm lead, the maximum amount of lead in white paints in the 14 other countries was 6,300 ppm in one white paint from Ethiopia and Kenya. The particularly low frequency of white paints containing very high levels of lead greater than 10,000 ppm supports the hypothesis that white lead pigments are now rarely used in solvent-based decorative paints in these countries due to the superior properties of the lead-free alternatives.

In addition, the relatively high frequency of paints with lead content ranging from 470 ppm to 6,300 ppm in 11 out of 15 countries suggests that lead-based driers are still used in many solvent-based decorative paints in majority of these countries.

**TABLE 3:** LEAD CONTENT OF BRIGHT-COLORED PAINTS.

| Country | Number of Paints | Percentage of Samples Above 90 ppm, % (Number) | Percentage of Samples Above 10,000 ppm, % (Number) | Minimum Lead Content, ppm | Maximum Lead Content, ppm |
|---|---|---|---|---|---|
| Benin | 27 | 81 (22) | 37 (10) | < 60 | 180,000 |
| Cameroon | 45 | 56 (25) | 22 (10) | < 60 | 220,000 |
| Côte d'Ivoire | 32 | 75 (24) | 44 (14) | < 60 | 470,000 |
| Egypt | 38 | 63 (24) | 5 (2) | < 60 | 43,000 |
| Ethiopia | 27 | 81 (22) | 56 (15) | < 60 | 100,000 |
| Guinea | 12 | 25 (3) | 0 (0) | < 60 | 9,700 |
| Kenya | 32 | 81 (26) | 53 (17) | < 60 | 160,000 |
| Morocco | 25 | 48 (12) | 24 (6) | < 60 | 140,000 |
| Mozambique | 22 | 23 (5) | 14 (3) | < 60 | 25,000 |
| Nigeria | 36 | 86 (31) | 75 (28) | < 60 | 160,000 |
| Sudan | 17 | 71 (12) | 41 (7) | < 60 | 71,000 |
| Tanzania | 26 | 62 (16) | 35 (9) | < 60 | 84,000 |
| Togo | 17 | 29 (5) | 12 (2) | < 60 | 42,000 |
| Uganda | 20 | 90 (18) | 55 (11) | < 60 | 150,000 |
| Zambia | 28 | 50 (14) | 25 (7) | < 60 | 120,000 |
| **Total** | **404** | **64 (259)** | **35 (141)** | **< 60** | **470,000** |

Bright-colored paints such as yellow, red, orange and green contained the highest concentrations of lead. Of all the 404 bright-colored paints, 64 percent contained lead levels greater than 90 ppm, and 35 percent had lead levels greater than 10,000 ppm.

Except for Guinea, one or more paints in all 14 other countries had lead levels ranging from very high (25,000 ppm) to extremely high (470,000 ppm). Clearly, lead pigments are used in these paints. On the other hand, bright-colored paints with lead levels below 90 ppm were available in all countries.

These findings are consistent with earlier studies from countries in Africa, Asia and Latin America, wherein white decorative paints had much lower lead levels compared to bright-colored paints.[15]

## LEAD CONCENTRATIONS IN LEADING PAINT BRANDS

Market-leading paint manufacturers in at least 12 of the 15 countries were shown to produce paints with very high levels of lead. Top paint brands in Benin, Cameroon, Côte d'Ivoire, Ethiopia, Kenya, Morocco, Mozambique, Nigeria, Sudan, Tanzania, Uganda and Zambia contained lead levels ranging from 11,000 ppm up to 220,000 ppm. Most of these brands were locally-manufactured, but some paints were imported from Europe, the Middle East, and other African countries.

On the other hand, leading paint manufacturers in Egypt, Guinea and Togo were shown to produce paints with low lead levels, a majority of which contained less than 90 ppm lead.

## CONSUMER INFORMATION ON PAINT CAN LABELS

A considerable number of paints (45 percent of paints) contained lead levels below 90 ppm, suggesting that paints without added lead are available on the market in all countries. However, few paints included information about any ingredients on paint can labels.

Only 27 out of 593 sampled paints (5 percent of paints) carried information about lead content—twelve paints sold and purchased in Mozambique.

Labels on 21 paints in four countries (Cameroon, Kenya, Morocco and Mozambique) made claims of "lead-free," "less than 90 ppm," "no added lead," and "unleaded paint." Twelve Mozambican paints with such claims contained lead levels below 90 ppm. However, five paints from Cameroon, Kenya and Morocco with lead-free or similar claims contained lead levels ranging from 110 ppm to 57,000 ppm.

Two paints claiming to be lead-free contained 57,000 ppm and 26,000 ppm lead. These paints from Morocco and Cameroon, respectively, were manufac-

tured by market leaders in these countries. None of these paints provided independent, third-party verifications to back up the accuracy of such claims.

Only six paints indicated warnings about the presence of lead on paint can labels. Two of these paints contained 470,000 ppm and 220,000 ppm lead—the highest lead content in all samples in 15 countries.

None of the paints provided precautionary warnings on the hazard of lead dust to children and pregnant women.

# 4. LEAD CONCENTRATIONS IN PAINTS BY COUNTRY

## BENIN

A total of 28 solvent-based paints for home use were purchased in retail stores in Benin. These paints represented 10 different brands produced by seven manufacturers.

Twenty-two out of 28 paints (79 percent of paints) contained lead levels greater than 90 ppm, with 10 paints (36 percent of paints) containing very high lead levels greater than 10,000 ppm. In addition, 10 out of 27 green, red and yellow paints (37 percent of bright-colored paints) contained lead levels greater than 10,000 ppm. The highest concentration of lead at 180,000 ppm was found in a yellow Azar Gloss Paint manufactured in Ghana.

Imported paint brands dominate 78 percent of the paint market, most of which were manufactured in Ghana such as Azar Gloss (Azar Chemical Industries Ltd) and Leylac (BBC Industrials Co. Ghana Ltd). The prices of these paint brands are cheaper compared to local paint brands and thus attract more consumers.

None of the 28 paint cans carried information about lead on its label, while only four paints (14 percent of paints) provided batch numbers.

## CAMEROON

A total of 65 cans of solvent-based paints intended for home use were purchased in retail shops in Cameroon. The sampled paints include 46 decorative paints, five of which were aerosol or spray paints, and 19 anticorrosive paints. These paints represented 23 different brands produced by 19 manufacturers.

For decorative paints, 19 out of 46 paints (41 percent of decorative paints) contained lead concentrations greater than 90 ppm, while eight paints (17 percent of decorative paints) contained dangerously high lead concentrations above 10,000 ppm. The highest lead concentration detected was 100,000 ppm in a yellow Prodec enamel paint.

For anticorrosive paints, nine out of 19 paints (47 percent of anticorrosive paints) contained lead concentrations greater than 90 ppm, while two paints (11 percent of decorative paints) contained dangerously high lead concentrations above 10,000 ppm. The highest lead concentration detected was 220,000 ppm in an orange Smaltominium (lead tetroxide) paint produced in Cameroon and sold for home use.

Overall, 25 out of 45 green, orange, red and yellow paints (56 percent of bright-colored paints) were lead paints, i.e., they contained lead concentrations above 90 ppm. In addition, 10 paints (22 percent of bright-colored paints) contained lead concentrations above 10,000 ppm.

The two companies with the largest market share are CEP/Seigneurie (50 to 60 percent market share) and Smalto (20 percent market share). Four paints from these market-leading brands contained very high lead concentrations ranging from 26,000 ppm to 220,000 ppm.

Only six out of 65 paints (nine percent of paints) provided information about lead on their labels, and most paints carried little information about ingredients. In addition, one yellow Seigneurie Paint, a local brand owned by the US-based multinational paint company, PPG Industries, Inc., contained 26,000 ppm lead despite advertisements and a claim on its product label that it contained "less than 90 ppm lead."

Manufacturing dates or batch numbers were included on the labels of 26 out of 65 paints analyzed.

## CÔTE D'IVOIRE

A total of 51 cans of solvent-based paints intended for home use were purchased in retail stores in Côte d'Ivoire. The analyzed paints include 43 decorative paints and eight anticorrosive paints. These paints represented 21 different brands produced by six manufacturers.

For decorative paints, 27 out of 43 paints (63 percent of decorative paints) contained lead concentrations greater than 90 ppm, while 13 paints (30 percent of decorative paints) contained dangerously high lead concentrations above 10,000 ppm. The highest lead concentration detected was 190,000 ppm in a yellow Autolac Paint.

For anticorrosive paints, nine out of 19 paints (47 percent of anticorrosive paints) contained lead concentrations greater than 90 ppm, while two paints (11 percent of decorative paints) contained dangerously high lead concentra-

tions above 10,000 ppm. The highest lead concentration detected was 470,000 ppm in a red Kimi Antirouille Paint sold for home use.

Overall, 24 out of 32 red and yellow paints (75 percent of bright-colored paints) contained lead concentrations above 90 ppm, of which 14 paints (44 percent of bright-colored paints) contained lead concentrations above 10,000 ppm.

All seven paints from the brands Ikarlac, Ikarsatin and Jaline, which were manufactured by TISA, the leading paint company in Côte d'Ivoire, contained lead levels below 90 ppm. However, paint brands such as Deluxe, Trapline and Tintorap from INDUSTRAP, the second largest paint manufacturer in the country, as well as paint brands like Autolac, Topline and Ultralac from DROCOLOR, the third largest paint manufacturer, contained very high lead concentrations ranging from 17,000 ppm up to 190,000 ppm.

Only one out of 51 paints provided information about lead on its label. The red anticorrosive paint containing 470,000 ppm of lead indicated that it "contains lead minium." However, the label did not mention the hazards of lead or the extremely high concentration of lead in the paint (almost 50 percent of the paint).

Manufacturing dates were included on the labels of 29 out of 51 paints, while batch numbers were indicated on 40 of the paints.

## EGYPT

A total of 58 cans of solvent-based paints intended for home use were purchased in retail shops in Egypt. The sampled paints include 54 decorative paints, nine of which were aerosol or spray paints, and four anticorrosive paints. These paints represented 17 different brands produced by 17 manufacturers.

For decorative paints, 32 out of 54 paints (59 percent of decorative paints) contained lead concentrations greater than 90 ppm, while two paints (four percent of decorative paints) contained dangerously high lead concentrations above 10,000 ppm. The highest lead concentration detected was 43,000 ppm in a red G5 enamel aerosol paint.

For anticorrosive paints, all four paints (100 percent of anticorrosive paints) contained lead concentrations greater than 90 ppm, but no paints exceeded 10,000 ppm. The highest lead concentration detected was 1,000 ppm in two red paints sold for home use from the brands Pachin and SIPES.

Overall, 24 out of 38 red and yellow paints (63 percent of bright-colored paints) contained lead concentrations above 90 ppm, while two paints (five percent of bright-colored paints) contained lead concentrations above 10,000 ppm.

None of the leading paint brands had lead levels exceeding 10,000 ppm. The two paints which exceeded 10,000 ppm were aerosol decorative paints.

None of the 58 paint cans carried information about lead on its label or provided batch numbers or manufacturing dates.

## ETHIOPIA

A total of 36 cans of solvent-based paint intended for home use were purchased from paint stores in Ethiopia. The paints represented 11 different brands produced by 11 manufacturers.

Twenty-seven out of 36 paints (75 percent of paints) contained lead levels greater than 90 ppm, including 15 paints (42 percent of paints) containing dangerously high lead concentrations greater than 10,000 ppm. The highest lead concentration detected was 100,000 ppm in two orange paints sold for home use—Abay Paints and Dil Paints, both of which were manufactured in Ethiopia.

Twenty-two out of 27 orange, red and yellow paints (81 percent of bright-colored paints) contained lead levels greater than 90 ppm, all of which also contained lead levels above 10,000 ppm.

Paints from market leading brands,Kokeb, Kadisco and Mega Paints, contained very high lead levels ranging from 36,000 ppm up to 98,000 ppm.

None of the 36 paint cans carried information about lead on its label or provided batch numbers. Only three paints indicated manufacturing dates.

## GUINEA

A total of 18 cans of solvent-based paint intended for home use were purchased from paint shops in Guinea. The paints represented four different brands produced by four manufacturers.

Only five out of 18 paints (28 percent of paints) contained lead levels greater than 90 ppm, and in no paints did lead concentrations exceed 10,000 ppm. The highest lead concentration detected was 9,700 ppm in a yellow Topec Paint.

Only three out of 12 green, orange, red and yellow paints (25 percent of bright-colored paints) contained lead levels greater than 90 ppm, and none of these contained lead levels above 10,000 ppm.

None of the 18 paint cans carried information about lead on its label, nor provided batch numbers or manufacturing dates.

## KENYA

A total of 51 cans of solvent-based paint intended for home use were purchased from retail stores in Kenya. The paints represented 21 different brands produced by 19 manufacturers.

Thirty-five out of 51 paints (69 percent of paints) contained lead levels greater than 90 ppm, including 17 paints (33 percent of paints) that contained dangerously high lead concentrations greater than 10,000 ppm. The highest lead concentration detected was 160,000 ppm in a yellow Molar Enamel Paint.

Twenty-six out of 32 orange, red and yellow paints (81 percent of bright-colored paints) contained lead levels greater than 90 ppm, of which 23 paints (72 percent of bright-colored paints) contained lead levels above 10,000 ppm.

Top paint brands Crown, Sadolin and Solai Paints contained very high lead levels ranging from 15,000 ppm up to 100,000 ppm.

Only three out of 51 paints (six percent of paints) provided information about lead on their labels. All three paints contained more than 90 ppm lead, ranging from 110 ppm to as high as 160,000 ppm, despite an advertisement or claim on its product label that the paint was "lead-free." In addition, 21 paints (41 percent of paints) provided manufacturing dates or batch numbers on paint can labels.

## MOROCCO

A total of 33 cans of solvent-based paints intended for home use were purchased in retail shops in Morocco. The sampled paints include 28 decorative paints and five anticorrosive paints. These paints represented 16 different brands produced by 11 manufacturers.

For decorative paints, 13 out of 28 paints (46 percent of decorative paints) contained lead concentrations greater than 90 ppm, while six paints (21 percent of decorative paints) contained dangerously high lead concentrations above

10,000 ppm. The highest lead concentration detected was 140,000 ppm in a yellow enamel paint.

For anticorrosive paints, all five paints (100 percent of anticorrosive paints) contained lead concentrations below 90 ppm.

Overall, 12 out of 25 green, orange, red and yellow paints (48 percent of bright-colored paints) contained lead concentrations above 90 ppm, of which six paints (24 percent of bright-colored paints) contained lead concentrations above 10,000 ppm.

Four paint brands from the leading paint manufacturers contained lead levels ranging from 17,000 ppm to 140,000 ppm.

Only two out of 33 paints (six percent of paints) provided information about lead on their labels. One yellow enamel paint contained 57,000 ppm lead, despite bearing an "unleaded paint" mark on its label. In addition, eight paints (24 percent of paints) provided batch numbers on paint can labels, while no paints provided manufacturing dates.

## MOZAMBIQUE

A total of 32 cans of solvent-based paint intended for home use were purchased from paint stores in Mozambique. The paints represented eight different brands produced by eight manufacturers.

Eight out of 32 paints (25 percent of paints) contained lead levels greater than 90 ppm, and only four paints (12 percent of paints) had lead concentrations greater than 10,000 ppm. The highest lead concentration detected was 25,000 ppm in a locally-manufactured yellow Pintex Paint.

Five out of 22 green, orange, red and yellow paints (23 percent of bright-colored paints) contained lead levels greater than 90 ppm, of which three paints (14 percent of paints) contained lead levels above 10,000 ppm.

All 22 paints of the Cinacryl, Barbolux, Dulux, Plascon, and Prominet brands contained lead levels below 90 ppm. Locally manufactured Robbialac, produced by the Kenyan Robbialac Berger Paint Ltd, contained 23,000 ppm lead.

Twelve out of 32 paints (38 percent of paints) provided information about lead on their labels. Dulux, Plascon and Prominent Paints bearing "lead-free" and "no added lead" proved to be accurate as all their 12 paints contained less than 60 ppm lead. In addition, 28 out of 32 paints (88 percent of paints) provided batch numbers or manufacturing dates on paint can labels.

## NIGERIA

A total of 54 cans of solvent-based paint intended for home use were purchased from retail stores in Nigeria. The paints represented 18 different brands produced by 16 manufacturers.

Forty out of 54 paints (74 percent of paints) contained lead levels greater than 90 ppm, and 29 paints (54 percent of paints) contained dangerously high lead concentrations greater than 10,000 ppm. The highest lead concentration detected was 160,000 ppm in a yellow Finecoat Paint sold for home use.

Thirty-one out of 36 red and yellow paints (86 percent of bright-colored paints) contained lead levels greater than 90 ppm, of which 28 paints (75 percent of bright-colored paints) contained lead levels above 10,000 ppm.

One or more paints from top locally manufactured paint brands including Meyer Paint (manufactured by DN Meyer Plc, the fifth-ranked paint company in Nigeria based on annual sales), Sandtex Paint (manufactured by Portland Paints and Products Nigeria Ltd, third-ranked in terms of annual sales), and Super Star Gloss (manufactured by Berger Paints Nigeria Plc, fourth-ranked in terms of annual sales) contained lead levels ranging from 26,000 ppm to 56,000 ppm.

The three out of 54 paints (six percent of paints) that provided warning information about the lead content of paints contained less than 60 ppm lead. In addition, 35 paints (65 percent of paints) provided manufacturing dates or batch numbers on paint can labels.

## SUDAN

A total of 25 cans of solvent-based paint intended for home use were purchased from paint shops in Sudan. The paints represented nine different brands produced by nine manufacturers.

Sixteen out of 25 paints (64 percent of paints) contained lead levels greater than 90 ppm, while seven paints (28 percent of paints) contained lead concentrations greater than 10,000 ppm. The highest lead concentration detected was 71,000 ppm in a yellow Elmohandis Paint manufactured in Sudan.

Twelve out of 17 red and yellow paints (71 percent of bright-colored paints) contained lead levels greater than 90 ppm, of which seven paints (41 percent of bright-colored paints) contained lead levels above 10,000 ppm.

Market leaders like African paints, National Paints and Nile Paints, as well as Celledur paints contained very high lead levels ranging from 24,000 ppm up to 60,000 ppm.

None of the 25 paint cans carried information about lead on its label, nor provided batch numbers or manufacturing dates.

## TANZANIA

A total of 46 cans of solvent-based paint intended for home use were purchased from retail stores in Tanzania. The paints represented 12 different brands produced by 12 manufacturers.

Twenty-one out of 46 paints (46 percent of paints) contained lead levels greater than 90 ppm, including 10 paints (22 percent of paints) that contained dangerously high lead concentrations greater than 10,000 ppm. The highest lead concentration detected was 84,000 ppm in a yellow Basco Value Paint.

Sixteen out of 26 green, orange, red and yellow paints (62 percent of bright-colored paints) contained lead levels greater than 90 ppm, of which nine paints (35 percent of bright-colored paints) contained lead levels above 10,000 ppm.

Market leading brands Basco, Berger Robbialaac, Crown and Goldstar Paints contained very high lead levels ranging from 11,000 ppm up to 84,000 ppm.

None of the 46 paint cans carried information about lead on its label, while 39 paints (85 percent of paints) provided manufacturing dates or batch numbers on paint can labels.

## TOGO

A total of 27 cans of solvent-based paint intended for home use were purchased from paint shops in Togo. The paints represented 12 different brands produced by 11 manufacturers.

Eight out of 27 paints (30 percent of paints) contained lead levels greater than 90 ppm, while two paints (seven percent of paints) contained lead levels greater than 10,000 ppm. The highest lead concentration detected was 42,000 ppm in a yellow Rak Paint.

Five out of 17 red and yellow paints (29 percent of bright-colored paints) contained lead levels greater than 90 ppm, while two paints (12 percent of bright-colored paints) contained lead levels above 10,000 ppm.

Eleven out of 12 paint brands included in the study were manufactured and imported from Benin, Brazil, Ghana, South Africa, and the United Arab Emirates.

None of the 27 paint cans carried information about lead on its label, while 14 paints (52 percent of paints) provided batch numbers or manufacturing dates.

## UGANDA

A total of 30 cans of solvent-based paint intended for home use were purchased from retail stores in Uganda. The paints represented 14 different brands produced by 14 manufacturers.

Twenty out of 30 paints (67 percent of paints) contained lead levels greater than 90 ppm, including 11 paints (37 percent of paints) that contained dangerously high lead concentrations greater than 10,000 ppm. The highest lead concentration detected was 150,000 ppm in two yellow paints from the brands Neptune and Sadolin.

Eighteen out of 20 red and yellow paints (90 percent of bright-colored paints) contained lead levels greater than 90 ppm, of which 11 paints (55 percent of bright-colored paints) contained lead levels above 10,000 ppm.

Top paint brands Basco, Global, Neptune, Peacock, Regal, Sadolin, and Sun Gloss Paints contained very high lead levels ranging from 23,000 ppm up to 150,000 ppm.

None of the 25 paint cans carried information about lead on its label, while 17 paints (57 percent of paints) provided manufacturing dates or batch numbers on paint can labels.

## ZAMBIA

A total of 39 cans of solvent-based paint intended for home use were purchased from retail stores in Zambia. The paints represented 13 different brands produced by 12 manufacturers.

Fourteen out of 39 paints (36 percent of paints) contained lead levels greater than 90 ppm, including seven paints (18 percent of paints) that contained dangerously high lead concentrations greater than 10,000 ppm. The highest lead concentration detected was 120,000 ppm in an orange Prozam.

Fourteen out of 28 green, orange, red and yellow paints (50 percent of bright-colored paints) contained lead levels greater than 90 ppm, of which seven

paints (25 percent of bright-colored paints) contained lead levels above 10,000 ppm.

Market leading paint brands African, Colorite, Decotex, Dulux, Plascon and Prozam Paints contained very high lead levels ranging from 13,000 ppm up to 120,000 ppm. A Dulux paint brand contained 88,000 ppm lead.

None of the 25 paint cans carried information about lead on its label, while 16 paints (41 percent of paints) provided manufacturing dates or batch numbers on paint can labels.

# 5. CONCLUSIONS AND RECOMMENDATIONS

Paints containing high levels of lead were widely available on the market in 15 countries: Benin, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Guinea, Kenya, Morocco, Mozambique, Nigeria, Sudan, Tanzania, Togo, Uganda and Zambia. However, the fact that a considerable number of paints (45 percent of paints) contained lead levels below 90 ppm indicates that the technology to produce paints without added lead exists in Africa.

Very few cans of paints with high lead concentrations had labeling disclosing lead content while none of the paint cans provided warnings about the hazards of lead. Some advertisements or claims that the analyzed paints did not contain lead proved inaccurate. Therefore, third-party verification mechanisms are necessary to establish the credibility of these claims.

Lead paint regulations are now under active consideration by the governments of Côte d'Ivoire, Ethiopia, Kenya and Tanzania. Through these recent studies, governments in other countries will have raw data to utilize in the drafting of national standards and regulations on lead in paint.

## RECOMMENDATIONS

### *International Agencies*

- Ensure that reliable data on the lead content of paints sold in African markets is generated and made publicly available to aid in the enactment of any meaningful and enforceable regulatory controls on the lead content of paints.
- Provide concrete guidance to individual governments seeking assistance in establishing regulatory controls on lead in paint to ensure that the standards and regulations enacted are protective of human health.
- Support the development of in-country laboratory capacity to analyze paint samples for lead content.

### *National Governments*

- Take immediate steps to begin developing lead paint regulations for all types of paint to support the Global Alliance to Eliminate Lead Paint (GAELP) in its goal for all countries to enact regulatory controls on lead in paint by 2020.
- For countries with draft regulations in place, fast track approval to 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.
- Hold multi-stakeholder consultations to address how the controls will be formulated and the timeline for their entry into force.
- Ensure that monitoring and enforcement measures are included in lead paint regulations.
- 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.

### *Paint Industry*

- Take immediate, voluntary action to eliminate lead in all paint formulations, with decorative and other paints used in and around homes and schools as a priority.
- Commit to third-party certification to ensure that claims of no added lead can be independently verified and trusted
- Implement measures to safeguard industry workers and painters from lead exposure.

### *Individual, Household and Institutional Consumers*

- Read paint can labels and demand paints with no added lead from paint manufacturers and retailers, as well as full disclosure of a paint product's content.
- Ask for, 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.

### *Public Health Groups, Consumer Organizations and Other Concerned Entities*

- Support policy initiatives that seek to eliminate lead paint.

- 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***

- Come together and unite in promoting a strong policy that will eliminate lead paint in all of Africa.
- Get involved and participate in the annual International Lead Poisoning Prevention Week of Action to highlight the hazards of lead, usually observed every fourth week of October.

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