

**G7 Workshop on
Lead as a Major Threat for Human Health and the Environment – An Integrated Approach
Strengthening Cooperation Towards Solutions**

9-10 November 2022, in Berlin, Germany and virtual

Workshop Summary Report¹

1. Introduction

- In their May 2022 Communiqué², G7 Climate, Energy and Environment Ministers collectively expressed a strong commitment to reduce lead in the environment and to reduce the disproportionate lead exposure in vulnerable communities.
- In November 2022, in line with that commitment, the European Union (EU) and the United States of America (USA) under the 2022 German G7 Presidency co-hosted a workshop in that regard. Many of the leading experts in reducing lead exposure from around the world were invited to meet with officials from G7 members and other stakeholders in Berlin and online (see participant list in Appendix 1). Their goal was to develop possible options for future work and cooperation to reduce lead poisoning in low and middle-income countries (LMICs)³. The workshop agenda has been attached to provide more information on the specific topics discussed (see Appendix 2).
- The workshop was informed by a stocktaking report⁴ by the Center for Global Development (CGD) which noted that “lead poisoning may be among the most pressing public health challenges faced by low- and middle-income countries (LMICs) and is certainly one of the least recognized and most neglected.”
- Further underscoring the importance of addressing lead, at the workshop the World Bank presented its most recent assessment of the global cost of the health effects of lead exposure which is estimated to be 4.6% of the global GDP (as purchasing power parity), or 3.5 trillion US dollars a year.⁵
- The present report contains a summary of the evidence, experience and recommendations as shared by the technical expert participants at the workshop. It also contains some content from the CGD report used as input for workshop discussions.
- The information of the workshop may also serve to inform others seeking to address the challenges of lead exposure globally.

¹ This report is a summary of stakeholder views provided, under Chatham House rules, in the G7 Workshop *Lead as a Major Threat for Human Health and the Environment – An Integrated Approach Strengthening Cooperation Towards Solutions* and does not necessarily represent the views of G7 members or any entity. We regret any errors or omissions that may have been unwittingly made.

² [G7 Climate, Energy and Environment Ministers' Communiqué, paragraph 36](#): “Underscoring our strong commitment to reduce lead in the environment, to reduce the disproportionate lead exposure in vulnerable communities, we encourage appropriate domestic regulation or control of lead in all countries, which can deliver societal benefits that far exceed the costs. We look forward to the EU-USA co-hosted workshop to be held under the German Presidency to take stock of G7 activities and develop possible options for future work and cooperation on sources of lead to reduce lead exposure in developing countries. The G7 aims to identify areas of action to strengthen the work to minimise lead pollution and exposure globally and strengthen cooperation with existing international initiatives and instruments, particularly SAICM. In doing so, the G7 will continue to work with multilateral organisations such as UNEP, WHO and UNICEF”

³ [Definition of LMICs](#).

⁴ <https://www.cgdev.org/publication/opportunities-g7-address-global-crisis-lead-poisoning-21st-century-rapid-stocktaking>. (A revised version of the report provided to the workshop)

⁵ Results submitted for publication and presented at the G7 Workshop by Dr. Valerie Hickey, Global Director, Environment, Natural Resources and Blue Economy of the World Bank.

- Following the workshop, G7 members utilized the recommendations as a basis to develop a separate “*Report to G7 Ministers on Key Workshop Outcomes*”⁶ with possible options for future G7 member work and cooperation on lead sources to reduce lead exposure in LMICs.

2. Key Messages

This section summarizes key messages about lead poisoning in LMICs provided by participants throughout the workshop.

1. Current widespread lead exposure in LMICs has a huge negative impact on children’s health and development potential; adults’ longevity and quality of life; and economic and social development.
2. According to estimates by the World Bank, 2.5 million premature deaths per year are now believed attributable to lead poisoning. This is more than caused by malaria, or HIV/AIDS. It is several times greater than deaths from poor sanitation. It includes 900 000 children.
3. In many LMICs, the average of children’s blood lead levels is high enough to merit medical intervention in any G7 country.
4. As with the successful global elimination of lead from petrol, there are interventions and measures to reduce lead exposure from other sources which could improve health, development, education and economic outcomes at relatively low cost when compared to other interventions to improve sustainable development in LMICs.
5. In a globalised world, lead contamination has been found to travel across borders in traded products, like cookware, spices, waste batteries etc. This reinforces the case for G7 action, including in supporting LMICs to reduce lead in traded products, with benefits for all.
6. A major barrier to reduction of harm is ignorance of the severity of harm from lead poisoning, including its negative impacts on health, development, education, economic outcomes and quality-of-life.
7. Workshop participants identified a range of measures and interventions that could be taken by G7 members, multilateral institutions, philanthropic organizations, and the private sector as well as by governments in LMICs, to stimulate and scale-up actions to reduce lead poisoning. These are presented throughout the report and include, for instance, building capacity in LMICs to establish and enforce laws, development and use of methods to reduce exposure at clinical level, supporting civil society organizations to raise awareness and maintain a focus on this work over time, and identifying and exploring ways to involve producers, industry and trade associations to exercise product stewardship and sustainable and responsible supply chain management for their products and relevant lead-contaminated articles.
8. Taking forward effective actions will require leadership and collaboration across governmental ministries and agencies, because there are multiple effects and causes of lead exposure which cut across administrative lines in most governments and international organizations.

3. The Problem

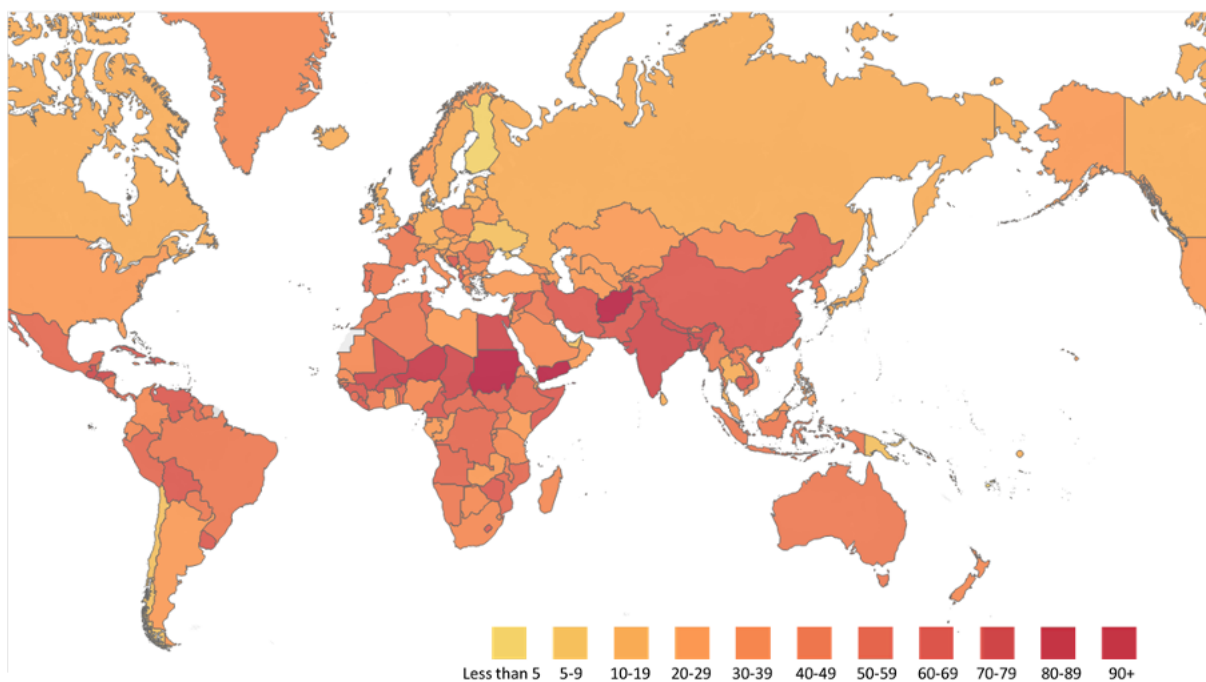
⁶ https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Europa___International/outcome_g7_workshop_lead_2022_bf.pdf

Participants presented information about the scope of the lead pollution problem in a series of panel discussions covering lead exposure in low- and middle-income countries (LMICs); approaches to address lead (with the participation of non-governmental organisations, international organisations and industry); and global economic impacts of lead.

According to the World Bank's updated assessment of the available evidence on the impacts, 4.6% of global GDP (as purchasing power parity) is lost to lead poisoning. Those costs, and the related human suffering, are caused from premature deaths, which occur primarily through damage to the heart, but also damage to brain, kidney, lungs and other organs. Lead poisoning impacts intellectual development, physical development, and physical health, especially in children. The 2.5 million estimated premature deaths attributed to lead poisoning comprises 5% of all deaths, globally.

Children are particularly vulnerable to poisoning: they absorb lead from the environment at a rate two to three times greater than adults, and their bodies have no way to remove the lead. Of the 4.6% global GDP (as purchasing power parity) estimated cost of impacts of lead exposure, 40% is estimated to stem from impacts on childhood development, which include lower IQ and reduced ability to contribute productively to society. One third of the world's children are believed to be impacted by lead. Neurological and behavioural effects of lead are believed to be permanent⁷.

The available evidence suggests that up to a half of children in LMICs have levels of lead exposure at which the WHO recommends public health intervention, and even levels below the WHO benchmark have been shown to carry significant risks. Even low-level, subclinical lead exposure during pregnancy and early childhood has been shown to cause substantial and lifelong deficits in cognitive ability, as well as issues with attention and behaviour control, according to CGD.



Map indicating the estimated percentage of 0-19 year olds with blood lead level above 5 µg/dl, based on data from the Institute for Health Metrics and Evaluation, 2019 Source: [CGD](#)

The map above shows the estimated percentage prevalence of lead in the blood of children and youths, at concentrations above the levels the WHO recommends clinical intervention and exposure source investigation.

⁷ [https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health#:~:text=The%20neurological%20and%20behavioural%20effects,and%20learning%20problems%20\(1\)](https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health#:~:text=The%20neurological%20and%20behavioural%20effects,and%20learning%20problems%20(1))

These numbers estimate the situation in 2019, but for those currently being exposed to lead, and those who will be exposed in the future, the effects are cumulative and ongoing. With fast-growing markets for lead and certain lead products, they are likely to be increasing each year.

Several discrete sources of lead poisoning have been identified, with certain sources being more significant in different communities and/or countries. These include, in no particular order:

- spices to which lead chromates are added to give bright colours,
- lead compounds added to paint to enhance certain properties, such as colour, drying ability, and anti-corrosion properties
- lead acid battery recycling without environmentally sound management procedures
- lead glazes in cookware fired in low-temperature kilns
- artisanal aluminium cooking pots, where lead is added to lower the metal's melting point during manufacture
- mining and ore smelting, producing lead dust and occupational exposure, and
- cosmetics – including traditional eyeliner (kohl)

Other potentially important sources include lead pipes; artisanal water pumps made from recycled used lead acid batteries; lead in ammunition and fishing weights; residual pollution from leaded petrol; light aviation fuel; lead in plastics around wires burnt during e-waste recycling; traditional medicines and ceremonial powders; toys, consumer goods and religious traditions involving lead.

Although the sources and exposure of lead poisoning can be clear in specific cases and on a local level, overall, there are many gaps in knowledge on the prevalence of different sources. One participant stated that, in their assessment, chronic lead poisoning, e.g., through lead in spices and cookware, has a higher negative health impact globally than spikes of local pollution, e.g., from lead acid batteries facilities or ore smelting. Improving evidence on the extent of lead poisoning and identifying the sources of exposure in specific locations can help in formulating the most effective interventions.

4. Opportunities for impactful actions

Opportunities for impactful actions were explored; potential actions on specific sources of lead-poisoning (cookware and spices, battery recycling, and lead in paint) were presented; and opportunities for how G7 members and others could prioritise and make progress were discussed.

4.1 Actions Needed Now

Given the current limited awareness and attention given to lead poisoning in LMICs, efforts to galvanize increased awareness, resourcing, and action to reduce lead poisoning can have a positive influence on both global development and individual livelihoods. The aim of the workshop included to explore what action could be triggered by G7 members, as well as national and multinational organisations working toward development, health and education goals.

The topic of lead poisoning offers government and civil society an opportunity to showcase linkages between health, education and economic development agendas globally, to communities working on those issues, beyond more specialized chemical management communities.

Additional action, including by G7 members, can make a meaningful difference now based on the following factors:

- **High returns on interventions:** Stakeholders indicated that because of the under-developed current state of international and national interventions on lead in LMICs, well-directed

international support actions for lead can have very beneficial impacts compared to their costs.

- **Existing and new interest:** Many of the participants in the workshop, including participants of G7 members, civil society organizations, non-governmental organisations, international organizations, and international financial institutions expressed interest in expanded action to eliminate lead exposure in LMICs.
- **Existing capacity for scaling-up:** NGOs, international governmental organizations, multilateral organisations, government agencies, philanthropic initiatives, health systems and civil society have ample skills, knowledge, dedication experience and expertise in interventions to reduce lead poisoning, which can provide capacity for rapid scaling up of activities.
- **Potential for multiple, additional funding sources:** Some industry-linked (e.g., the Clarios Foundation) and philanthropic funders have been responsible for significant actions to reduce lead exposure from certain sources. With increasing momentum, these and other funders may provide additional, complementary sources of support for interventions to reduce lead exposure.
- **Domestic benefits:** Actions to be taken in LMICs may have synergies with domestic goals in G7 member countries. For example, some health surveillance programmes in the United States – such as in New York City and Portland - discovered several instances of severe lead-poisoning in residents, including immigrants using spices or cookware contaminated with lead during production outside the U.S. These exposures could be reduced through intervention in partnership with the countries of product origin.

Significant benefits may come from increased co-operation, including among G7 members, such as:

- Co-ordination or collective prioritisation and complementarity of resources allocated to reduce lead poisoning in LMICs.
- Exchange on and alignment of domestic regulatory approaches or interventions – particularly in relation to internationally traded products, such as vehicles and end-of-life vehicles containing lead acid batteries and materials from lead acid batteries, to enhance effectiveness of the incentives and standards set for international supply chains and enforcement of waste regulations. This may be particularly valuable for mapping international flows of products and materials and considering increasing requirements for safe recycling of lead exported out of the G7.
- Partnerships between willing members of the G20 which help focus attention and co-ordinate or stimulate additional action by a wide range of stakeholders in this area.

4.2 Specific Routes for G7 member action

Some specific routes for action by G7 members were identified in the workshop:

1. Leading through domestic action

G7 members can offer value in leading by example, including by matching domestic standards for lead exposure to meet most stringent WHO advice; enforcing domestic and international rules concerning the export of lead-containing waste and products to third countries, particularly LMICs; and by expanding domestic and border surveillance and sharing of data on lead poisoning with countries exporting consumer products found to have high levels of lead.

2. Leveraging the strength of a high-level emphasis on the importance of this issue

Stakeholders indicated that continued emphasis on the critical importance of this issue by G7 (and possibly G20) members is helpful. Development of aligned action towards a target or timeframe, e.g., reducing new child blood exposure levels by a certain percentage by a target date, to help bring countries together to address this issue, was also recommended by some participants.

3. Catalyzing and facilitating in partnership with LMICs

The most effective interventions for LMICs will be taken within the LMICs, by national governments, civil society or private actors. The primary role of G7 member governments can be to catalyze, facilitate and support these actions, including by creating conditions for greater action in LMICs.

To effectively support action, LMIC governments and agencies, industry and civil society must be real partners, rather than passive recipients of advice or external influence. This is one lesson from the emerging international consensus on limits on lead in paint, in which guidance was developed in consultation with LMIC stakeholders leading to an outcome useful for their situations.

4. Promoting inter-sectoral collaboration in the chemicals management context

The Fifth International Conference on Chemicals Management ICCM5 on Strategic Approach on International Chemicals Management (SAICM), taking place 25-29 September 2023 in Bonn is an excellent opportunity to direct a major focus on the overall issue of lead exposure as a broadened element of the existing issue of concern on lead in paint to implement sustainable development to protect environment and human health as part of an effective, inter-governmental, cross-ministry and multi-stakeholder approaches to address lead exposure can be developed.

5. Tailoring interventions to the primary sources and drivers of exposure in specific localities

As the sources of exposure and the capacities of government agencies and communities to act differ between localities, the most suitable interventions must be designed to match the local exposure routes, the needs and acceptability of interventions to the local communities.

6. Promoting integrated health interventions

Actions to address lead poisoning may often complement wider actions to improve health and development in LMICs. For example, since lead poisoning often occurs together with other exposures, improving testing for chemicals and other heavy metals in blood could address numerous challenges most efficiently. Integrating action on lead into existing systems for health and development is the most effective route to solutions.

7. Raising awareness of key decision makers in LMICs through health surveillance

Some participants indicated that - given the importance of monitoring and testing of the potentially affected population by lead poisoning in LMICs - an initial step to raise awareness and call for action could be for G7 members to test their expatriate staff who may be exposed to lead pollution without knowledge. Sharing this information (in full respect of data privacy rules) with the local administrations could stimulate further action by them and contribute to tackling lead poisoning as a health and development issue in their country.

8. Joining forces for multilateral data sharing

In the past, the WHO held a repository of national blood level and lead source data. The WHO could reprise this role, to allow comparison and progress. Formal rules on how the national data is produced would be needed to allow those comparisons.

9. Co-operating with the private sector

In most cases, new technologies are not needed to reduce lead poisoning. Thus, the direct economic costs to industry to reduce the exposure may very low, where best practices for environmentally sound management and alternatives are available. Industry partners initially willing to change (for example, reducing lead in paint, or promoting safe battery recycling) should be engaged to lead the way, and demonstrate the possibilities for wider change.

10. Recognize the underlying causes and effects of lead poisoning

Poverty is often a root cause of much lead exposure and poisoning, with workers and communities often having no choice but to work or live with exposure to lead, for example working in smelters or attending school near informal lead smelting, even where they realise the harm. Through its effects of poor health and hindered neurological development of individuals, lead poisoning also holds back social and economic development at the population scale.

11. Global co-ordination to address a global problem

International cooperation is critical to reducing lead poisoning, considering the global scope of the challenge:

- Global trade and movement across borders of personally purchased products and foods can contribute to lead poisoning.
- Investments from more developed countries in LMIC lead operations with low environmental standards can contribute to lead exposure.
- Used lead acid batteries, many of them originating in developed countries, are recycled in ways producing pollution.

Problems or solutions outside the G7 members' own boundaries are only effectively tackled by multi-state co-operative action. For example:

- Parties to the Rotterdam Convention that have not yet done so, could consider notifying national bans of lead chromates to the Convention.
- Adoption of responsible industry practices in LMIC operations owned or invested in by companies from more developed countries, or in supply chain companies, regulatory approaches and consumption behaviour can promote change in LMICs.
- Collective action on developing requirements for due diligence in global value chains could have a significant influence on global markets. This could be particularly relevant for verifying that the recycled lead imported in large volumes for commercial and industrial purposes originates from recyclers using environmentally sound management practices.

12. Initiating forums for cross-agency collaborative action

Some steps to reduce lead poisoning may benefit from increased collaboration with other agencies / ministries than those dealing with environmental protection, incl. those working on development, trade and economy – for example, the development of lower-cost methods for monitoring of blood lead levels (which is necessary to facilitate greater testing) would need involvement of research or innovation agencies / ministries.

Collective governmental action will often best involve collaboration with industry and civil society who can provide additional expertise to government officials on this topic, as has been shown on lead paint or traded waste lead acid batteries.

13. Build on lessons from existing models of intervention

For many of the major identified sources of lead poisoning, such as lead paint, used lead acid batteries, spices, and cookware, there has already been at least one intervention, often internationally supported, to screen for poisoning or to reduce lead exposure. These prior interventions can provide

valuable lessons for the planning of new or scaled up actions. Workshop participants shared insights from many of these, including:

- International action to support countries to put legislation in place to eliminate lead from paint, which has increased the number of nations that have enacted laws to more than 90.
- Actions to remove lead from petrol globally resulted in the phase out of lead-in petrol in all nations.
- International support to increase monitoring of blood lead levels in Mexico, as part of wider health screening, identified levels of lead in newborn babies (received from their mothers). This raised awareness that triggered consequential action to reduce lead poisoning across the population.
- International support helped officials in Georgia and Bangladesh identify that lead was being added to spices as colourant and work with producers to reduce the practice. In Georgia, preliminary studies show that blood lead levels are reducing, including possibly as a result of this intervention.

5. High-level recommendations on appropriate interventions in LMICs

5.1 Improving the evidence base on sources and exposure routes

- Although local sources of lead poisoning can sometimes be clear (for example where unregulated lead-smelting takes place, and action could be taken immediately), evidence of poisoning through testing of blood lead levels is still often helpful to stimulate action. This is because chronic lead poisoning is a subtle form of pollution and may go unnoticed until too late, unless blood tests are carried out.
- Thus, one key intervention to address lead poisoning is to facilitate increased gathering of data on blood lead levels⁸, ideally as part of a programme of health surveillance, or by integrating blood lead level testing into the regular interventions of a national health system, perhaps taking place with immunisation programmes (and together with testing for other heavy metal poisons). To achieve this, effective interventions also need to include increasing national laboratory testing capacity.
- Improved monitoring and source identification, such as through testing foods and products for lead content, would also allow for better prioritisation and targeting of interventions. In addition, where people in households have high blood lead levels, follow-up investigations to conduct such testing can reveal the source of the lead poisoning.
- Monitoring and testing practices can be the start-point for identification and tracking of sources: monitoring in New York City led to identification of imported Georgian spices as the source of lead exposure. This created support for interventions in Georgia that significantly reduced lead in spices.
- Improving monitoring data also can help to effectively advocate for funding for interventions, because impacts then can be monitored, which is a pre-condition of much public and philanthropic funding.

5.2 Building awareness of the negative impacts and sources of lead exposure

Lack of awareness of the significant negative impact of lead poisoning can be seen as one of the main drivers of exposure and the greatest barriers to successful interventions. Thus, awareness raising across the range of actors can be an important intervention. For example:

⁸ See point 12 under section 4.2 above.

- People adding lead chromates into spices or paint to improve their colour are often unaware that the addition is harmful and some stop once they are informed.
- Local communities around lead smelters, including workers at those smelters, are often unaware of the negative health impacts or how they can protect themselves. Even basic mitigation measures (such as wearing personal protective equipment in recycling facilities or smelters) can help reduce exposure when people understand the harms.
- Government officials – including health and education officials – often have limited awareness of the extent or sources of lead poisoning, and they are more likely to act when they better understand the danger to their citizens.
- Informal battery collectors in Africa have been reported to mix parts loads of broken, used lead acid batteries for recycling in trucks together with unpacked foods for sale in city markets, but would be less likely to make this mistake if they understood the resulting harm.

Steps to promote effective communication to raise awareness were suggested, including identification of target audiences, knowledge gaps, messaging, and actions to reduce exposure, using these guiding questions:

- Who should know about it?
- What are they thinking?
- How do we talk about it?
- What should they know about it?
- What should they do about it?

5.3 Supporting legislative change

For many of the sources of lead poisoning, national regulatory measures can play a significant role in reducing exposure. Cooperative activities by the Global Alliance to Eliminate Lead Paint have supported the creation of national legislation in many countries which have been effective at promoting standard practices to eliminate lead in manufacture of paints.

Regulatory standards provide an impetus for change and are particularly appropriate as a solution for lead added to products, where alternatives are available. Legislative change at the national level can be supported by international cooperation to highlight solutions, address barriers to action and determine appropriate consensus-based voluntary standards which can support setting of national legislation.

5.4 Supporting enforcement of legislation

Effective enforcement is critical to the success of legislation to reduce lead exposure. Limited knowledge of legislation, the harm caused by lead and appropriate compliance practices by the regulated community and limited enforcement resources in the government can undermine effectiveness in changing practices that lead to exposure. Interventions which build the capacity of local communities or NGOs to identify and address gaps in enforcement of laws can help address this challenge.

One example of international cooperation to promote effective enforcement is collaboration among partners in the Global Alliance to Eliminate Lead Paint to help UNEP develop *Guidance on Lead Paint Law Compliance and Enforcement*, which is currently available in draft and will be posted in final form on the UNEP website in 2023.

5.5 Using available economic drivers to limit exposure

For some sources of poisoning -- particularly relating to mining, smelting and used lead acid battery recycling -- short-term economic outcomes were identified as a key barrier to reducing exposure. For example:

- Unregulated smelters, which are usually more polluting, can offer better prices for lead recovered from used lead acid batteries than regulated smelters, providing a market advantage to the unregulated smelters. In Indonesia, for this reason, regulated smelters operate significantly under their capacity, while lead goes to unregulated smelters leading to more lead exposure.
- Taxation applied to regulated smelters also gives a competitive advantage to unregulated smelters, who can then supply smelted lead to international traders at lower prices.

These economic drivers can be mitigated by positive market incentives for improvements in the environmental performance of smelters. Engagements with smelters – for example on behalf of the International Lead Association (an industry organisation) – provide lessons on how these can work. The routes to do this include:

- Improving traceability through international value chains for lead and lead-containing products to identify lead that was recycled safely from used lead acid batteries and facilitate sourcing of lead from better performing smelters. This will provide a means for market forces to recognise and reward safer smelting, whilst enabling lead used in G7 members to be responsibly sourced to reduce lead poisoning.
- Promoting corporate responsibility for safer operation of overseas smelting operations can be a strong driver for changing economic incentives. The majority investors in smelters in Africa are Chinese and Indian companies, whilst companies from Japan own the majority of smelting operations for recycled lead in Indonesia. The adoption of improved national corporate responsibility practices by these investors, and others based in more developed countries would therefore have significant LMIC impacts. The G7 and G20 are appropriate forum for the exchange of policy experience on how to promote such corporate responsibility.
- Tax relief for regulated, less polluting smelters can level the playing field with other producers.

1. Recommendations for interventions on specific sources of lead exposure, with supporting rationale

Three certain major sources of lead exposure were discussed in detail.

A) Lead in food and cookware

The break-out group discussed experiences of poisoning from lead in products and remediating interventions from Bangladesh, Mexico, Central America, South Africa, Brazil; and many other countries, including Georgia, India and Pakistan.

The problem

There are several routes for lead exposure through use of food and cookware. These sources of lead are found in products made in formal and mass production facilities as well as informal sectors (such as by cottage/artisanal manufacturers). This discussion looked particularly at:

- Addition of lead chromate pigments for colouring food and consumer products, in particular spices (e.g., in Georgia and Bangladesh).

- Use of certain ceramic ware and artisanal pots, of the type often bought as tourist or cultural items (e.g., in Mexico and Morocco) which have been glazed in low-temperature kilns, and leach lead into food when used to cook tomato or lemon sauces.
- Mass-produced ceramics have also been found to leach lead during use.
- Cookware being made from aluminium waste, such as discarded appliances and old car parts, in which lead is used to lower the melting point during production.
- While not food or cookware, use of lead in firearms and ammunition
- While not food or cookware, use of lead-based cosmetics, including on children, as part of cultural traditions.

Overall, the problem is not decreasing, and for some sources, is increasing. For example, in some countries, as witnessed in South Africa, there is rapid growth in the manufacture of pots from aluminium waste. Though evidence shows these pots can leach metals (including lead and arsenic) into the food cooked in them, the pots are widely used in home and school settings and for the preparation of street foods and events catering, with a potentially significant public health impact.

Recommended best practices to tackle lead poisoning from food, cookware and these other sources included:

First, **identify the source** of measured high blood lead levels:

- There are some good practices in industrialized countries, for instance in the United States, where results from blood concentration testing (particularly those integrated into children's health programmes) have been used to identify sources of lead in products. Where elevated blood lead levels are found, subsequent investigations of the effected households are used to identify the products containing the source of lead, and then the origin of the product can be systematically tracked through global value chains.
- This approach can be equally well applied to LMICs, for instance by integrated blood lead tests for young children and pregnant individuals at risk for lead exposure. However, this would need to be significantly facilitated by an increase in laboratory testing capacities and the availability of low-cost testing materials (which requires innovation and commercialisation).
- This data on sources is needed to guide and win support for action and policy change.

Secondly, **protect consumers** by:

- Eliminating the source of lead exposure, including international engagement where evidence shows the source originates in another country (as often the case for cookware and contaminated spices).
- Raise public awareness, particularly among specific at-risk communities who are using certain products (e.g. pans imported from Afghanistan, used by Afghan immigrants in developed countries).
- Education of consumers to avoid use when possible (e.g. by identifying safe alternatives, like stainless steel pots) or to utilize risk management strategies (e.g. keep items away from children, or wash hands after use)

Thirdly, **work in international partnership**:

- Collaborations between health agencies, NGOs and other global stakeholders have been shown to be successful in eliminating possible lead sources in the products' countries of origin, e.g., collaborative action on lead in spices in Georgia and Bangladesh that rapidly delivered significant reduction in lead chromate contamination.

- Comprehensive blood lead testing is needed across nations to better understand the burden on children and the most important sources of lead exposure from large data sets.
- Work together to place import or trade restrictions on cookware being sold into G7 members that has been identified to contain lead, for example the Afghan pressure cookers identified in the United States as having the highest lead levels.
- Create producer and e- and re-tailers responsibility in the supply-chain in G7 and other developed countries. For example, expansion of sales of electronic products via the global electronic marketplace in recent years has meant that products manufactured using unsafe practices or with unsafe components are now more available to consumers. Collective action could facilitate significant changes to supply chains.

Fourthly, stimulate **appropriate actions for LMIC goals** and conditions:

- Support awareness-raising, education and risk communication for small-scale producers, whilst also increasing the availability of safe alternative methods or alternative income streams for artisanal or small-scale producers currently using low-temperature kilns. Alternative opportunities for the artisans to make a living is essential for change.
- Work with LMIC partners to develop enforceable regulations, including for industrial-scale factories in LMICs where products are manufactured using lead.
- More advanced national restrictions—or even outright bans—could be considered for the manufacture or use of lead-based compounds without essential industrial application, for example lead chromate pigment.

B) Unsafe recycling of used lead acid batteries

The problem

In some LMICs, the recycling of used lead acid batteries under unsafe conditions contaminates air, soil and water – poisoning people and the environment. The most immediate impacts are to the health of those working with the used lead acid batteries, their families and surrounding communities.

Lead acid batteries last around 3 to 5 years on average, with shorter lifespans in hotter countries. The lead within them is then recycled, typically for use in new lead acid batteries. The price on the global market for lead has doubled in recent years, making recycling even more profitable, and nearly all countries have formal or informal networks for collection of used lead acid batteries and their delivery for recycling. Although it is possible to recycle lead profitably without any harm, as happens in developed countries, the lead recycling practices in LMICs very often are highly dangerous.

When used lead acid batteries are broken to access the lead metal, the liquid electrolyte inside – which also contains high concentrations of lead – is often poured away without any restriction. Broken used lead acid batteries may even be transported together with food produce for market. No precautions are taken in the handling of the material at any stage. Cash economics and ignorance of risks drives these dangerous recycling practices, of which workshop participants spoke from direct experience in African countries, Indonesia and India.

Lead from used lead acid batteries is often smelted in the open, releasing lead into the air and the nearby environment. Profitable smelters using safer processes are competitively disadvantaged compared to operators who follow no safety measures. In some countries, regulators choose not to establish rules because they do not want to limit workers' ability to earn money from this business –

usually not realizing the significant, often fatal, harm that workers and communities experience from this work.

Much of the economic drive for recycling comes from international trade and demand for lead – for example, large exports of lead from used lead acid batteries collected in Africa to meet demand in India and China. Significant investments have been made by some international companies in smelting and recycling operations that are reported to be operated unsafely in Africa and other LMICs.

Some of the lead entering G7 member markets for production of new lead acid batteries is reported to use lead that may have been smelted in highly-polluting processes, either because corporations are not conducting due diligence on the origin of the lead, or because the lead is bought through international traders and the origin is not tracked at all.

Although major steps have been taken to create ‘closed-loop recycling’ of used lead acid batteries in some developed countries, some lead acid batteries produced by manufacturers, including manufacturers based in G7 members, continue to be recycled unsafely in LMICs.

Drivers of lead poisoning from unsafe battery recycling in LMICs

Break-out group participants from around the world spoke of their direct experience of the drivers of lead poisoning from battery recycling:

1. A lack of awareness of the serious harm from lead – in the people collecting and handling lead from used lead acid batteries; workers in smelters; regulators; nearby residents and communities; and communities disempowered by their own lack of knowledge or inability to influence others’ decisions.
2. Short-term profits or desire for any employment take priority over health impacts. To save costs, even some legal, regulated smelters require battery collectors to break open used lead acid batteries and pour off the highly polluting lead-containing acid.
3. Some public officials are unaware of clean smelting alternatives, or lack legal authority, capacity or resources to require improvements. In some instances, corruption is reported to be a factor.
4. Stopping trade or closing small dirty smelters may only move or increase the problem:
 - Because of economic drivers, when informal smelters are closed new ones are set up elsewhere to meet demand, spreading lead pollution to another site. Unless an LMIC has capacity to enforce closure of all small smelters, as China managed, interventions must be found which change the underlying economic incentives, for example rewarding improvement of large smelters.
5. Global trade drives the unsafe operations:
 - Demand for lead on global markets often lacks transparency on the origin of the lead, and whether it has been produced without regard for human health or environmental impacts. This is particularly the case where lead is purchased through metal traders, where information on origin is lost.
 - Overseas investors from G7 or G20 members often invest in smelters in LMICs which do not operate to safe standards.
 - In South America, legal barriers to cross-border trade prevents used lead acid batteries reaching high-quality recycling facilities with capacity in other countries, as a result of interplay between the Basel Convention and the national constitutions of some states in the region.

Recommended Interventions to tackle the drivers:

1. Improve supply chain due diligence for lead recycled from used lead acid batteries. This could include:
 - Effective due diligence practices on lead, of an equally effective standard in G7 countries, their industries, and beyond, to create a critical mass and a level-playing field for trade.
 - Much-improved transparency mechanisms in value chains – with validated, authenticated information on provenance of recycled lead to be used for batteries and other products. These can build on existing and developing digital technologies for product passports for other materials, and industry transparency programmes, such as LeadBattery360⁹; the work of the International Lead Association and the Global Battery Alliance.
2. The adoption of direct one-for-one exchange of used lead acid batteries for new batteries at the end of their life (which more reliably demonstrates that used lead acid batteries are being returned for safe recycling compared to documenting this exchange through paper-based proof of compliance).
3. Changing the economic incentives:
 - Reform tax regimes, such as the Value Added Tax, so that they do not disadvantage regulated smelting operations in comparison with the unregulated operations they compete with.
 - Leverage the power of large buyers of used lead acid batteries and other lead-containing material – creating international mechanisms for them to demand transparency in their value chains to help ensure that the lead in their products has not come from sources produced or recycled in an unsafe manner. These large buyers include the telecommunications companies and banks in LMICs which are often internationally owned (considering that telecoms masts and ATMs are the biggest users of lead acid batteries).
4. Influence economic incentives through stronger global voluntary standards and efforts to increase sourcing of lead that can be traced to certified recycling facilities.
5. Implementing effective national Extended Producer Responsibility (EPR) schemes – and making these appropriate for internationally traded products - is important. However, the prospect of a well-enforced future EPR is no solution for not enforcing existing regulation and working with industry now.

Recommendations for impactful actions by G7 members

To support the initiation or scaling up of effective interventions, G7 members can:

- Raise awareness so that affected communities, regulators, investors, consumers and others know about the harm of lead exposure from used lead acid battery recycling processes.
- Support expansion of LMIC health monitoring and lead testing capacity, to identify and quantify the problem.
- Build multinational collaborations, engaging industry and investors, to improve health outcomes.

⁹ [LeadBattery360° - Powering a Sustainable Future](#)

- Expand the sharing of best practices from G7 members, such as on closed-loop recycling schemes and standard operating procedures to guide safer processes, for example building on past International Lead Association programmes which can help promote local buy-in of industry and administrations.
- Deepen knowledge of trade flows in lead products – including the indirect trade in recycled lead from used lead acid batteries from LMICs (e.g. from Africa via China and India) to other developed countries, including G7 members.
- Ensure trade occurs in an environmentally sound manner, taking into consideration requirements under the Basel Convention and national-level requirements applicable to transboundary movement of waste lead-acid batteries.
- Promote collaborative action with relevant countries, including India, China, Indonesia, Korea and Mexico, which are major markets or producers for recycled lead, so an essential part of the solution for changing economic drivers.
- Create an international multi-stakeholder process which involves the actors along the value chain working together to define and develop the collaborative solutions to identify and reward safely recycled lead in globally traded products – e.g., via the Strategic Approach to International Chemicals Management (SAICM).
- Promote safe global lead production as an opportunity for industrial development in G7 members. Ongoing economic transition requires smelting to provide imports of lead into the G7 to meet demand, whilst increasing safe smelting would increase demand for exports of the equipment needed for clean smelting from the G7 (particularly France and Italy).
- Support the revision of the Basel Convention Technical Guidelines on the Environmentally Sound Management of Waste Lead-acid Batteries to provide guidance on safe recycling practices and help ensure that trade in waste lead-acid batteries occurs in compliance with Basel Convention requirements.
- Develop collaborative action and exchange on responsible sourcing for imports of recycled lead into G7 Members.
- Work at multilateral level to encourage a wider geographic participation of companies in industry-led associations that promote and share best practices in sustainable recycled lead sourcing and facility audits, potentially building on the International Lead Association.
- Consider appropriate, aligned regulations on the exports of products (as well as waste) containing lead, in which the exporters guarantee a functional end-use system for lead components.

C) Lead in Paint

The problem

- Lead paints remain widely available and widely used in most low and middle-income countries.
 - More than half of countries do not yet have legal limits on lead content in paint.
 - Studies investigating the lead content of paint in over 60 LMICs have shown high levels of lead in paint available on the market.
 - These studies have taken place across Asia, Africa, Latin America, and Eastern Europe, and almost all have found lead paints available on the market. For example, this year a study in Madagascar found that 61% of home-use solvent-based paints available on the market contained dangerous levels of lead (above 90 ppm).

- Not only is the sale and use of lead paint widespread across LMICs, but also paint production is increasing significantly year on year, so the problem continues to grow.
- Use of lead paint is of particular concern when used in homes, schools, and other environments where children are present. Once used on a surface, these paints can be a source of exposure for decades.
 - Children are exposed as painted surfaces naturally generate dust and flakes, which are ingested by children through inhalation and normal hand to mouth behaviour. Exposure can be exacerbated in warmer climates, as paint deteriorates or ages, and during application and removal.
 - The focus of most of the paint studies carried out in LMICs has been on residential and decorative solvent-based paint. Surveys and market data show that solvent-based paints are widely used in homes in LMICs, and more so than in high income countries (HICs).
 - Other types of paints, such as water based, industrial, anti-corrosive, and spray paints can also contain high levels of lead and are also used in environments around children. For example, industrial paints containing extremely high lead concentrations have been found in children's playgrounds in Brazil, Mexico, South Africa, Thailand, the Philippines, Indonesia, and Malaysia.
- Studies from HICs and LMICs demonstrate that lead paint contributes to children's elevated blood lead levels.
 - In HICs lead paint remains a significant source of childhood lead poisoning even decades after it has been banned.
 - In LMICs where lead paint is still available on the market, lead paint contributes to elevated blood lead levels. Studies of children in India, Nepal, Pakistan, Iran, Egypt, Nigeria, Benin, South Africa, and Brazil have shown a significant association between raised blood lead levels and lead paint in the home, the school, or the day care centre. Evidence on the linkage between paint and blood lead, such as in Vietnam, was discussed in the breakout group. There high levels of lead were found in solvent-based paints for home use, toys, on walls of pre-schools, and on walls in children's homes and in their blood with averages exceeding the WHO's 5 ug/dl threshold.
 - Lead paint is therefore likely to be an important contributor to the widespread lead poisoning in LMICs.

Drivers of the Problem

In LMICs where lead remains in paint, the main drivers of the problem discussed by the break-out group included:

- Lack of awareness of the public, policymakers and paint manufacturers, vendors, and users.
- Lack of technical capacity in SME paint manufacturers to reformulate paint without lead, and a lack of equipment for large scale reformulated paint manufacture.
- Lack of regulatory provisions limiting lead in paint, or compliance and enforcement systems to induce change.
- Lack of capacity to address the issue of lead exposure from paints and other sources in a holistic way.

Best Practices to Address the Problem

The most effective means of preventing lead exposure from paints is to establish national laws and policies to phase out lead paint manufacture, import, and sale. Ninety-one countries now have legal limits on lead in paint and companies in many LMICs have shown that reformulation to produce paint without lead is possible. Existing, effective interventions in LMICs to remove lead from paint can be used to showcase and steer the design and enactment of appropriate interventions in other LMICs.

The break-out group discussed a package of measures taken in Ethiopia, including a new regulation on lead in paint, to address very high levels of lead in paint. After identifying the problem clearly, officials discussed the consequences of lead in paint with industry. These discussions affected industry leaders, some of whom took voluntary actions to address the problem. Ethiopian officials also supported lab accreditation, facilitated paint industry documentation of compliance with the new requirements, and set up regular testing to monitor implementation. They also conducted discussions with industry leaders, who were emotionally impacted once they heard of the health impacts and took voluntary actions to remove lead from paint in advance of the regulation. After the package of interventions, most paints met the 90 ppm standard.

In many countries, the Global Alliance to Eliminate Lead Paint, a multilateral partnership which includes partners from some G7 nations, has been a key factor in success of LMIC efforts to phase out lead in paint. The key features of this partnership include:

- Lead paint was recognized in 2009 as an international chemicals priority by SAICM
- As a result, the Alliance was established in 2011, modelled after the successful efforts of the Partnership for Clean Fuels and Vehicles to phase lead out of gasoline, and including its collaborative approach of including key stakeholders to encourage collaboration on the objective of phase out of lead in paint.
- The Alliance has developed many tools to assist LMICs in phasing out lead paint, including:
 - a Model Law for Regulating Lead in Paint and
 - Paint Reformulation Guidelines for paint manufacturers
 - Toolkit for establishing laws to eliminate lead paint
 - Frequently Asked Questions
 - Draft Lead Paint Law Compliance and Enforcement Guidance
 - Direct legal drafting assistance upon request
- Funding from the Global Environment Facility for UNEP, WHO, and IPEN activities to support action to phase out lead in paint gave momentum to the rate of contributed to action by countries phasing out lead paint.
- This funding contributed to efforts working with international governmental organizations and civil society to work at the country level to build their capacity to phase out lead paint. For example, the International Pollutants Elimination Network (IPEN) through its member network of 600 public interest NGOs in more than 120 countries contributed expertise to drafting efforts and developed test data on lead paint in markets around the world. Regional offices in UNEP and regional and country offices in WHO also worked closely with country governments to facilitate the phase out of lead paint. These efforts continue to a lesser degree after the GEF Project has ended, due to funding constraints.

The current partnership approach to stimulating collaborative action has been effective over 10 years because:

- With the right support, SMEs in any country can remove lead from their paint production and still be competitive on the market.

- Working with all stakeholders helps with the development of laws and also helps with promoting compliance with laws in countries where there is a lack of resources for enforcement.
- Implementation of policies to phase out lead paint contributes to mainstreaming primary prevention in the sound management of chemicals.

International efforts to reduce lead exposure from paint have prioritised removing lead paint from the market in order to prevent additional application of lead paint, especially in homes, schools, etc., in order to stop the problem growing. In addition, steps can also be taken in G7 countries and LMICs to reduce the exposure to lead in paint that has already been applied. Renovation activities which can cause exposure to lead in paint dust from disturbing painted surfaces and scraping off paint and schools with decaying paint that may leave lead dust in playgrounds can result in lead exposure. The break-out session discussed steps of:

- Increasing awareness of the dangers of lead in paint; use of influencers in awareness raising campaign.
- Creating guidelines with paint manufactures for methods to remove paint containing lead during renovation with reduced exposure – for example wet scraping as discussed in the context of the Philippines.
- Screening of blood lead levels to help identify sources of lead exposure (for example in playgrounds or schools). G7 members have a lot of experience in screening, which can be shared – e.g., working with university researchers, and applying appropriate methodologies for screening.
- Increasing testing capacity and reducing its costs. Increase availability and lower price of environmental testing that parents and civil society can use to detect the presence of lead.
- Working with paint manufacturers who understand the risks of lead, to safely remove lead and repaint schools where existing paint is harmful.
- Providing information to homeowners and governments about what can be done if lead is detected in homes or on playgrounds.
- Using lead in soil and in other sources outside blood for determining risk from lead. This was recommended because the levels tested there are in achievable and quantifiable limits and in some cases there are over-the-counter-tests (Amazon sells lead swabs), though these do not provide accurate quantitative results.

Recommendations for Interventions by G7 members

The break-out group listed how G7 Members, and others, can valuably assist where they:

- Stimulate action to increase awareness of the public, industry, and government policymakers of the dangers of lead paint.
- Help mainstream the lead in paint issues to help governments add the issue into the chemicals and waste agenda, sectoral programs, and plans. This could lead to a higher prioritization and resource allocation.
- Provide technical information for paint producers to use alternatives to lead in paint.
- In countries without laws to phase out lead paint, provide legal drafting assistance and other support to develop these.
- In countries with lead phaseout policies, support their effective implementation, compliance, and enforcement.

- In both sets of countries, build lead paint testing capacity.
- Work globally, such as encouraging Rotterdam Convention parties to notify national bans of lead chromates to the Rotterdam Convention and reject imports of paint into G7 member countries where the paint does not meet criteria for or lead exceeds the regulatory limit, and end exports of pigments containing lead from G7 members for overseas paint manufacture.

6. Summary of Recommendations heard during the Workshop

Following the breakout sessions, the workshop concluded with a discussion of recommendations as gathered in two days of discussions of the stakeholders. This section presents a summary of the recommendations that were compiled by the organizers based on the workshop discussions and presented to the participants for discussion.

Overarching principles

Overall, participants encouraged actions at global, bilateral, national and local levels, and indicated that continued emphasis on the critical importance of this issue by G7 (and possibly G20) members is helpful. Stakeholders urged G7 action and recognition of the breadth of this topic, as it affects women, children, health, environmental justice – all facets of society – and understanding of the challenge as a global health emergency. Finally, participants noted the importance of addressing sources already known to be a problem with immediate short-term solutions.

Types of efforts needed

The types of efforts identified to address this challenge included standards and guidelines (international and national), health interventions, cooperation, capacity building, and monitoring. These are detailed below:

- Possible **collaboration opportunities** were identified with G7, G20, OECD, UNEP, WHO, UNICEF, the World Bank, FAO, and others; existing international policy structures such as Basel Convention, Rotterdam Convention, SAICM, GEF, and Sustainable Development Goals (SDGs); and existing international partnerships (e.g. the Global Alliance to Eliminate Lead Paint).
- Workshop participants identified the need to **raise awareness** with public health professionals, health personnel, institutional staff in technical agencies that have country offices, and the public, and to support civil society organizations raising awareness and maintaining focus on this work over time.
- It was recommended to work toward **capacity building to establish and enforce laws**, noting the need for legislation to prevent environmental and health impacts of relevant industrial facilities in LMICs, and for strengthened enforcement to effectively implement new and existing laws and standards.
- Support **effective, transparent facility auditing** in LMICs, possibly starting with joint audits, and providing knowledge. As it was reported that auditors can experience threats, this could also include creating safe environments for honest auditors.
- The most important **health interventions** could include efforts to develop and use methods to reduce exposure at clinical level, such as chelation, antidotes, and using WHO guidelines; enhancing nutrition; and training of health workers, including through an online course, to detect lead poisoning.
- **Surveillance** is needed to integrate blood lead levels into standard health monitoring programs/surveys. A global repository to capture all existing data would be beneficial, along with testing for sources, surfaces, and blood; testing of newborns/cord blood to identify maternal exposure; testing for a panel of metals and pesticides; and studies at country level

to identify the highest priority populations and sources. It was recommended to support governments in having ownership over their data as a matter of national leadership.

- Efforts are needed to identify significant sources of high blood levels and how to prioritize multiple sources of exposure for single child. Thus, **research and technology needs** include better diagnostic tools, including an improved and inexpensive blood lead screening method, accurate enough to be the basis of intervention with individual children, noting that a larger market would facilitate more affordable tools. A competition to find new methods was suggested. Additionally, research is needed to understand trade flows of lead products and compounds.
- It was recognized that **existing models** can provide a basis for further work, such as the Model Law of the Global Alliance to Eliminate Lead Paint; the recent SAICM GEF project addressing lead paint; the Partnership for Clean Fuels and Vehicles, and an E-waste effort to remove lead from solder.
- It will be key to **partner with industry** to identify and explore ways to involve producers, industry and trade associations to exercise product stewardship and sustainable and responsible supply chain management for their products and relevant lead-contaminated articles, including through extended producer responsibility schemes. It will also be important to change the economic incentives around unsafe lead use and recycling in LMICs to reduce lead exposure, including supporting small enterprises (paint, etc); efforts to shift informal small operations to battery recycling in industrial installations; and support for extended producer responsibilities and methods such as LeadBattery360 program. It was suggested to invite major users of lead acid batteries, such as telecom companies and banks, to commit to only work with lead from high standard recycling.
- **Trade, supply chains and due diligence** can be helpful as part of the solution; including working to prevent distribution of contaminated products worldwide; with importers to ensure lead is responsibly sourced; enhancing export regulation enforcement to ensure lead only reaches functional waste systems; promoting due diligence on lead sourcing, such as in the EU Corporate Sustainability Due Diligence directive¹⁰; developing global systems to track lead raw materials; and integrating lead into environmental and social governance (ESG) metrics.
- **G7 member leadership** could be helpful to create and strengthen institutional responsibility and regulatory controls; eliminate use of lead in plastics (PVC), ammunitions and other products, where feasible; update emissions and ambient air standards for lead to address industrial emissions; update occupational lead standards; use blood lead testing in G7 members to identify issues that may originate abroad and work with those countries to address the issue; and eliminate all uses of lead in all types of paints. G7 members were also invited to partner with UNICEF through the the *'Healthy environments, Healthy children'* programme.
- Finally, participants noted the following **international policy opportunities**: promoting an indicator for the SDG chemicals goal based on deaths from lead; SAICM/ICCM5; new environmental sound management (ESM) Guidelines under Basel; notifying national bans of lead chromates to the Rotterdam Convention; and the possibility of a voluntary or binding international agreement.

As conclusion of the workshop participants from G7 members identified possible options for future work and cooperation on lead sources to reduce lead exposure in LMICs in a *"Report to G7 Ministers on Key Workshop Outcomes"*s:

https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Europa___International/outcome_g7_workshop_lead_2022_bf.pdf.

¹⁰ Details available on this link: [Corporate sustainability due diligence](#).

Agenda for the G7 Workshop: Lead as a major threat for human health and the environment – an integrated approach strengthening cooperation toward solutions

Spielfeld Digital Hub GmbH
Skalitzer Str. 85/96, 10997 Berlin, Germany
and virtual
9-10 November 2022

Moderation: *Dr. Minu Hemmati*

Wednesday 9 November 2022

12:00-13:00*	Registration and small lunch with finger food
13:00-13:20	<p>Welcome by the G7 Presidency and co-organisers</p> <ul style="list-style-type: none"> • Dr. Eva Kracht, Director-General for International and European Policy, Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection, Germany • Astrid Schomaker, Director for Global Sustainable Development, European Commission, European Union (virtual) • Jane Nishida, Assistant Administrator, Environment Protection Agency, Office of International and Tribal Affairs, United States of America (virtual)
13:20-13:40	<p>Setting the scene – part I</p> <p>Introduction Outline of stocktaking report and key highlights, including overview of the impacts of lead in environment in general Rachel Silverman, <i>Center for Global Development</i></p>
13:40-13:45	Video on Global Lead Exposure, PureEarth
13:45-14:45	<p>Lead Exposure in Low- and Middle-Income Countries (LMICs) <i>Panel</i></p> <p>Rachael Kupka, <i>Global Alliance on Health and Pollution</i> Dr. Md. Mahbubur Rahman, <i>Lead and Project Coordinator, International Center for Diarrheal Disease Research, Bangladesh</i> Dr. Mara Téllez Rojo, <i>Instituto Nacional de Salud Pública, México</i> Ruma Tavorath, <i>Zambia Mining and Environmental Remediation and Improvement Project Team Leader, World Bank</i> Dr. Angela Mathee, <i>South African Medical Research Council</i></p> <p>Questions for panelists/audience discussion:</p> <ul style="list-style-type: none"> • What routes of lead exposure are causing harm? • What are good opportunities to reduce routes of lead exposure now?
14:45-15:45	<p>Approaches to Address Lead (NGO/IGO) <i>Panel</i></p> <p>Sara Brosche, <i>IPEN</i> Carla Valle-Klann, <i>Basel Convention Secretariat</i> Drew McCartor, <i>PureEarth</i> Lesley Onyon, <i>World Health Organisation (WHO)</i> Abheet Solomon, <i>UNICEF</i></p> <p>Question for audience/panelist discussion:</p> <ul style="list-style-type: none"> • What are the features of interventions are most effective in addressing lead issues?

15:45-16:00	Coffee
	Setting the scene part II
	<i>Examples of Key Drivers and Successes toward Reducing Lead Sources</i>
16:00-16:10	<i>Global Economic Impacts of Lead and related World Bank Programs</i> <i>Dr. Valerie Hickey, Global Director for Environment, Natural Resources, and Blue Economy, World Bank</i>
16:10-16:20	<i>Successes on lead in gasoline and lead in paint</i> <i>Jacqueline Alvarez, Economy Division Chemicals and Health Branch, UNEP on behalf of</i> <i>Sheila Aggarwal-Khan, Director Economy Division, UNEP</i>
16:20 – 16:30	<i>Questions and Answers</i>
16:30-17:00	<i>Approaches to Address Lead (Industry)</i> <i>Panel</i> <i>Steve Binks, International Lead Association</i> <i>Heidi McAuliffe, World Coatings Council</i>
	Question for audience/panelist discussion: <ul style="list-style-type: none"> • What can industry (and others, including international organizations and international financial institutions) do that would make a meaningful difference in addressing lead?
17:00-18:00	<i>G7 Member Actions to Address Lead</i> <i>Panel</i>
	G-7 member representatives share what they have learned from addressing lead that could be relevant for action in LMICs
	Question for audience discussion: <ul style="list-style-type: none"> • What should G7 members prioritize when addressing lead?

Thursday 10 November 2022

9:00-9:30	Recap of first day's exchanges Dr. Minu Hemmati , Moderator - and assigned presenter –	
Coffee-break		
9:45-11:20	Breakout sessions <i>To analyse in depth existing challenges and how G7 (and G20) could contribute addressing them, and to propose possible follow up activities.</i>	
Lead in batteries Moderator: Jürgen Helbig (tbc) / Christian Hudson (tbc), EC <i>Panel (40 minutes)</i> Drew Mercator , Pure Earth Ahmad Safrudin , KPBB, Indonesia Alberto Santos Capra , Basel Convention Regional Centre for South America in Argentina Dr. Sampson Atiemo , Mountain Research Institute, Ghana Dr. Leslie Adogame , SRADeV Nigeria Dr. Christian Rosenkranz , Industry and Governmental Relations EMEA, CLARIOS <i>Discussion (55 minutes)</i>	Lead in paint Moderator: Angela Bandemehr, US EPA <i>Panel (40 minutes)</i> Mihaela Paun , UNEP Elena Jardan , WHO Jeiel Guarino , IPEN Lucia Coulter , LEEP Thuy Nguyen Kim , CGFED Girma Gemechu , Environment Protection Agency, Ethiopia <i>Discussion (55 minutes)</i>	Lead in food and cookware Moderator: Steffi Richter, Germany <i>Panel (40 minutes)</i> Dr. Paromita Hore , New York City Health Department Dr. Steve Whittaker , Seattle/King County, USA Dr. Jenna Forsyth , Stanford University Dr. Angela Mathee , South African Medical Research Council Dr. Antonio Menezes-Filho , University of Brazil Daniel Estrada , Pure Earth Mexico <i>Discussion (55 minutes)</i>
11:20-11:30	Coffee Break	
11:30-12:30	Breakout session readouts and discussion	
12:30-13:30	Lunch	
13:30-14:30	Identification of key recommendations Dr. Minu Hemmati , Moderator - and other assigned presenters from each breakout group –	
14:30-14:45	Closing remarks by the G7 Presidency and co-organisers <ul style="list-style-type: none"> • Dr. Steffi Richter, Federal Ministry of the Environment of Germany • Hodayah Finman, US EPA • Luca Marmo, European Commission, European Union 	
Coffee break		
15:00-16:00	Preparation of recommendations (closed session of G7 Members)	

**Participants and Contributors in the G7 Workshop on “Lead as a major threat for human health and the environment - an integrated approach strengthening cooperation toward solutions”
09-10 November 2022 in Berlin**

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