



# VIRTUAL WORKSHOP REPORT ADVANCING A LEAD POLLUTION AND HEALTH ROADMAP FOR BANGLADESH

Prepared by: Pure Earth Bangladesh  
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## EXECUTIVE SUMMARY

“Together, we can end lead pollution.” On 19<sup>th</sup> July 2021, **Pure Earth Bangladesh**, in coordination with the **Bangladesh Department of Environment (DoE)** and with support from **United States Agency for International Development (under Cooperative Agreement No. AID-OAAA-16-00019)**, **OAK Foundation**, **Swiss Agency for Development and Corporation SDC**, and the **Global Alliance on Health and Pollution (GAHP)** held a virtual workshop titled ‘*Advancing a Lead Pollution and Health Roadmap for Bangladesh*’. The workshop convened stakeholders with three goals: to share the state of knowledge about lead exposure from all sources in Bangladesh; build a common understanding of the related challenges, and lay the groundwork for a unified approach to lead exposure reduction. The event was enriched by more than **65 diverse sets of experts** representing government agencies, national and international civil society organizations, research and academic institutions, and development agencies. The workshop, also attended by print and electronic media agencies, received excellent media coverage.

Despite the severe impacts of lead on public health and economic development, few programs and policies exist to adequately control contemporary lead sources, reduce exposures, and identify and treat lead-poisoned children. There is also a lack of communication and coordination among stakeholders and no unified plan at the national level. The overwhelming outcome of the meeting was that lead poisoning in Bangladesh should be viewed as a public health crisis. The speakers and participants shared recommendations to improve this situation, with a particular emphasis on establishing a multi-stakeholder approach with the leadership of the relevant government ministries to eradicate community lead exposure. Participants also discussed preparing comprehensive lead pollution studies, developing a national inventory on lead pollution sources, and importantly, a time-bound national action plan.

Additionally, the following topics were deemed to be of high priority to properly implement the roadmap – improved occupational health safety in lead-related industries, identifying community areas that are contaminated with lead and taking steps to restore these communities, increasing the monitoring capacity of the Department of Environment and the Ministry of Industry, addressing the import of lead chromate as a pigment, and ensuring effective industrial waste management. The participants and speakers highlighted the need for mechanisms to shift illegal, informal used lead-acid battery recycling industries to registered facilities, and consider options for alternative livelihoods among workers in informal lead industries. There were also suggestions for awareness building among the public and policymakers, and the organization of various training sessions and workshops to enhance the knowledge and skills of stakeholders related to lead pollution.

Notably, during the workshop, the Additional Secretary of the Ministry of Environment, Forest, and Climate Change committed to prioritizing the issue of lead exposure within the Ministry and requested the DoE to take the lead in a joint, multi-stakeholder approach to eradicating lead pollution.

## OBJECTIVES

The primary goal of the workshop in support of the Lead Pollution and Health Roadmap was to help the Government of Bangladesh and partner organizations share current information and move towards a coordinated, unified and multi-sectoral approach to address lead pollution challenges.

*The overall goals of this workshop were:*

- ◆ **Understand how lead work in the country is evolving**
- ◆ **Build a common understanding of lead challenges, sources, impacts, and opportunities**
- ◆ **Develop common goals and strategies to mitigate lead exposures**

## MAJOR INSIGHTS FROM THE WORKSHOP ACTIVITIES

The following are key points from the speakers and participants:

***Welcome Speech:** Abdullah Al Mamun, Deputy Director, Chemical and Waste Management Unit, DoE*

- ◆ Bangladesh is one of the most lead impacted countries in the world.
- ◆ The average blood lead level in children in Bangladesh is 7.5 mcg/dL, which is 50% higher than the common health guidelines.
- ◆ 4% of total deaths in Bangladesh are caused by direct or indirect exposure to lead pollution, making Bangladesh the 4th most impacted country in the world.
- ◆ Almost 70% of intellectual disabilities in Bangladesh are caused by lead pollution.
- ◆ The economic loss caused by the effects of lead pollution is equal to 6% of Bangladesh's GDP or 50% of the total income generated from apparels and textiles.
- ◆ The Bangladesh government has recently issued a special SRO on ULABs.
- ◆ The government will enforce the e-waste management rules of 2021.
- ◆ Pure Earth and the Department of Environment are working closely to combat lead pollution especially to control the sources of lead, reduce the exposure, and identify and treat children who are exposed to lead.
- ◆ With the input from multiple sectors, a strategic paper is being developed on the sources and impacts of lead exposure in Bangladesh. It will provide a strategic framework to align the government and non-government agencies, academia, national and international development agencies, and many other relevant stakeholders.
- ◆ Alternative livelihoods options should be created for the ULAB recycling workers to make the shift towards the formal sector.

- ◆ He suggested that the Coordination committee can be formed in the Ministry and the technical committee can be formed under the leadership of the Director-General of the Department of Environment (DoE) to prevent lead pollution.

**Background and efforts to date:** *Andrew McCartor, VP, Strategy & Partnerships, Pure Earth*

- ◆ There has been a positive change on the issue of lead – many organizations have picked up lead as a priority (University of Dhaka; ESDO; icddr,b; Stanford University; UNEP; UNICEF; International Lead Association; Accumulators Battery Manufacturers and Exporters Association of Bangladesh). The government has been active on this issue.
- ◆ Pure Earth has observed that donor organizations are interested in working on eradicating lead in Bangladesh.
- ◆ There is room for more coordination and communication between the government, the NGOs, universities, UN groups, the donors, and various stakeholders to striving common goals and strategies. Until now the projects have been somewhat intermittent and siloed.
- ◆ There is a very strong justification for further work on lead in Bangladesh.
- ◆ Bangladesh has banned lead in paint which is a significant achievement and a great step forward, but it was not a silver bullet to solve the problem completely. In the west and high-income countries, the death rate due to lead exposure declined after banning lead-based gasoline, but in Bangladesh, it has increased over the last three decades.
- ◆ Pure Earth has documented 300 lead-contaminated sites in Bangladesh.
- ◆ The chief concern of lead exposure is its impact on children’s brains. Lead causes permanent brain damage and IQ loss, and as a result, decreases economic productivity.
- ◆ Productivity losses from lead exposure reduce Bangladesh’s GDP by about 16B USD (1.3T Taka) annually, thus lead is not only a health issue but a poverty-reduction issue.
- ◆ The safe management of the ULAB also is critical to address climate solutions.

*The full presentation on the ‘Background and efforts to date’ is included in **Annex A**.*

**Lead exposure sources: current status and needs:** *Dr. Shahriar Hossain, Ecologist, General Secretary, Environment and Social Development Organization (ESDO)*

- ◆ It is important to understand what are the sources of lead and to understand why Bangladesh is among the most highly exposed countries.
- ◆ More discussion is needed around the source of lead in consumer products and there is a need for effective guidelines and regulations which are currently not available.
- ◆ Contamination of soil due to lead is a serious issue, as it ends up in the food chain.
- ◆ Gold ash processing is a recently-discovered source of lead exposure in Bangladesh.
- ◆ Spices, particularly turmeric, cause exposure to lead. icddr,b has researched this extensively.
- ◆ World Bank estimates there are 1100 informal ULAB recycling sites. ESDO estimates 2000+.

- ◆ Shifting ULAB recycling from informal to formal sector is very important.
- ◆ There are a growing number of relevant rules and regulations (e-waste, updated SRO on LABs 2021, household paint standard 2018), but enforcement is a problem. Inspectors, officials, and stakeholders need to be aware of the sources and impacts of lead.
- ◆ Public awareness and participation, behavior change are important.
- ◆ Recent studies have identified lead in food (rice, vegetables, and liquid milk). We have to understand how lead is entering in the food chain.
- ◆ Regional and global cooperation is required.
- ◆ Government should establish a holistic national framework that considers all sources of lead, with provisions for monitoring and enforcement.

*The full presentation on the ‘Lead exposure sources: current status and needs’ is included in **Annex B**.*

***Opportunities in the health sector:** Dr. Anwar Sadat, Deputy Program Manager, Planning, Monitoring and Research (PMR), Directorate General of Health Services (DGHS)*

- ◆ There is currently no routine blood lead level (BLL) testing in Bangladesh, but research efforts indicate that children in Bangladesh are among the most highly exposed to lead globally.
- ◆ All BLL data is currently conducted by development partners or research institutions. The government has not yet generated evidence on the current situation.
- ◆ A recent systematic review in 2021 estimates the mean BLL in Bangladesh is 7.87 µg/dL.
- ◆ Research has indicated seven districts as lead hotspots – Dhaka, Gazipur, Tangail, Bogura, Mymensingh, Khulna, and Magura.
- ◆ Several lead pollution causes were highlighted – pesticide use, industrial waste (including ULAB), shipbreaking, turmeric processing.
- ◆ ULABs are imported from India, recycled, and the lead is sold back to India.
- ◆ Comprehensive data on contributing sources are needed to respond to interventions.
- ◆ Prevention is the key due to lead’s long-term effects.
- ◆ Blood lead level testing provides information on acute exposures but to get an understanding of cumulative lead exposure, bone lead level testing is needed.
- ◆ The health sector cannot do this alone. Multi-sectoral cooperation is needed.
- ◆ DGHS already formed a Technical Implementation Committee for PECP. PMR is considering establishing multi-sectoral activities and a committee to lead this project.
- ◆ Current initiatives:
  - Health Sector Situational Analysis (in development phase). Similar analyses should be carried out by the Ministries of Environment and Industry.
  - In process of developing communication materials for national campaigns and training modules for health service providers, particularly in lead-affected areas.
  - Raising awareness of lead poisoning in health systems and structures. Meeting with health sector regulatory bodies and research organizations to help with this.
  - Integrating lead pollution into policies and programs.

- Establishing multi-sectoral networking and collaborations for synergistic impact with relevant stakeholders (may convene after Eid).

The full presentation on the ‘**Opportunities in the health sector**’ is included in **Annex C**.

**Possible next steps:** Andrew McCartor, VP, Strategy and Partnerships, Pure Earth

**Structure of recommendations:** short- and long-term interventions in four categories:

1. Used lead-acid batteries
2. Other lead-related industrial sources
3. Consumer products
4. Health Sector

### 1. Used lead-acid batteries

#### **Short-Term Steps:**

- ◆ Establish a multi-sectoral stakeholder engagement group with government leadership
- ◆ Review and assess current environmental performance standards
- ◆ Identify current needs for training or technical assistance around the environmentally sound management (ESM) of ULAB
- ◆ Perform an economic analysis of economic tools/instruments
- ◆ Develop a national inventory of active and legacy illegal ULAB recycling sites
- ◆ Raise public and consumer awareness

#### **Long-Term Steps:**

- ◆ Support the elaboration of Statutory Regulatory Order (SRO) into a full law and enforcement of the conditions laid out in the SRO
- ◆ Implement an economic tool to incentivize the recycling of ULABs in the formal sector.
- ◆ Develop a program to assess, prioritize and remediate sites

### 2. Other lead-related industrial sources

**Short-Term Steps:** Implement systematic monitoring and assessment around lead-related industries

**Long-Term Steps:** Improve environmental controls, identify alternatives methods, or relocate

### 3. Consumer products

#### **Short-Term Steps:**

- ◆ Support research organizations to quantify the extent and sources of lead exposure

- ◆ Conduct market assessments
- ◆ Continual public education campaigns

**Long-Term Steps:** Systematic monitoring and enforcement

#### **4. Health Sector**

**Short-Term Steps:**

- ◆ Capacity building workshops for service providers
- ◆ Build technical capacity and institutional knowledge for BLL testing
- ◆ Facilitate multi-sectoral coordination among health, environmental, education, and communication sectors

**Long-Term Steps:**

- ◆ Strengthen blood lead levels (BLL) monitoring and reporting systems (including source identification and interventions)
- ◆ Build capacity for evidence-based decision making

*The full presentation on the ‘Findings on next steps’ is included in Annex D.*

**Major insights from the Open discussion and Q/A session on the next steps:** *Moderator: Dr. Mahfuzar Rahman, Country Director, Bangladesh, Pure Earth*

#### **Dr. Mahbub, icddr,b**

- ◆ It is important to inform the public about the situation and sensitize the print and electronic media to play a crucial role in creating awareness in the public about the sources and effects of lead pollution and spurring government bodies to act.
- ◆ As most people may not be aware of the harmful effects of lead, community awareness on this issue should be raised before taking regulatory actions.
- ◆ Many countries are using lithium-ion batteries or long-lasting batteries and noted that lead-acid battery quality is low in Bangladesh, so alternatives should be considered.
- ◆ The efforts of Pure Earth and the U. of Dhaka in identifying and mapping ULAB recycling sites in Bangladesh are laudable. Informal recyclers rapidly move and create new contaminated sites, so ongoing surveillance is needed (not just ULAB sites, but others like e-waste).
- ◆ The occupational health and safety hazards of working with lead are significant and it is important to educate workers working directly with lead.
- ◆ The Ministry of Industry and Ministry of Commerce should monitor the import of lead chromate as a pigment so that misuse of the compound does not happen (as an additive in turmeric). Food safety inspectors and workers from different sectors at the sub-district level could be trained and equipped to monitor.

- ◆ The informal ULAB recycling industry is growing and sustaining in Bangladesh because of the current cost-benefit scenario. Industry wants the government to subsidize the formal recycling of ULAB. Currently, the formal sector is mostly only refining, while the informal sector is doing most of the recycling.

#### **Md. Zia-ul Haque, Director, Dhaka Region, Department of Environment (DoE)**

- ◆ Md. Zia-ul Haque expressed his support for the short- and long-term recommendations.
- ◆ A multi-sectoral coordination committee is important and the MOEFCC should take the lead on this issue.
- ◆ It is important to conduct a national inventory of all sources of lead pollution and create a time-bound action plan (roadmap) to tackle this issue.
- ◆ DoE is supportive of action in the area and is committed to continued involvement, leadership, and coordination with DGHS, icddr,b, ESDO, Ministry of Commerce, and Ministry of Industry.
- ◆ As he has observed in his current role as Director of Dhaka Region, it is important to monitor lead pollution from industrial sources.
- ◆ There is a need to consider existing legislation to advance our future strategy.
- ◆ DoE now has a Chemical and Waste Management branch; a holistic approach to lead and mercury could be considered.

#### **Mostafa Yusuf, Reporter, The Daily Star**

- ◆ Recently the government destroyed 16 recycling facilities near Dhaka, but that these illegal sites keep cropping up, so strict monitoring from the government is needed to ensure that closed illegal ULAB recycling sites are not reopened. Increased manpower and logistics from the government are needed to respond.
- ◆ He noted that he was unaware of the impact of lead contamination and got to know about this serious issue by reading the articles of Dr. Mahfuzar Rahman and from this workshop.

#### **Dr. Aoerangajeb Hossain, Researcher, DGHS**

- ◆ As a researcher of environmental health, particularly heavy metals and suitable technologies for waste remediation, he reiterated concern over the occupational health of workers in lead industries.
- ◆ Effective waste management across all sectors, especially industrial waste, is important because contaminated waste ends up affecting health through different pathways, including the agricultural chain. Tannery waste in particular contains lead.

#### **Dr. Minjoon Kim, Health Specialist, Health section, UNICEF**

- ◆ UNICEF, DGHS, and Pure Earth are collaborating and working to mainstream lead poisoning issues of the health sector.
- ◆ UNICEF is helping the DGHS in conducting studies on assessment of the capacity of the healthcare sector and the treatment options for lead poisoning. It is important to have a “no one is left behind” approach to lead poisoning.

- ◆ This event will help create opportunities for wider consultation.
- ◆ UNICEF is very keen to collaborate with other government departments as well to form a multi-sectoral approach to this issue. They are also working on developing policy advocacy documents.

### **Irfan Noor**

What options do consumers have in terms of alternatives to lead-acid batteries, spices tainted with lead, if they want to reduce lead exposure?

- *Response (Andrew McCarter, Pure Earth):* We need to develop communication materials to inform the public about these options and alternatives, and we can explore more about them in the future.

### **Zohura Sikdar, Deputy Director (Chemical), BSTI**

BSTI has updated its standards for toys, cosmetics, household paint, and fuel oil; BSTI standards follow ISO norms.

*Speech: Chief Guest: Mr. Ahmed Shamim Al Razi, Additional Secretary, Ministry of Environment, Forest and Climate Change*

- ◆ Shamim Al Razi committed on behalf of the *Ministry of Environment, Forest, and Climate Change* to start working on the eradication of lead exposures. He added that the Department of Environment should take the lead to mainstream this issue with proper actions as this department is committed to prevent exposures to hazardous chemicals.
- ◆ The government's election manifesto also pledges to play an effective role in protecting and developing the environment
- ◆ The government has made it a priority to protect the environment for future generations.
- ◆ Lead pollution is a cross-cutting issue that includes multiple stakeholders.
- ◆ The relevant government departments and ministries to work closely on this issue are the Ministry of Environment, Forest and Climate Change, the Department of Environment, Ministry of Health, Ministry of Commerce, Ministry of Industry, and the Local Government Division (LGD).
- ◆ The local government has a crucial role in raising awareness and battling this issue at the community level.
- ◆ An existing study found seven districts that have lead contamination, of which Chittagong was not included. Further studies of lead contamination should be conducted in the Chittagong district since the shipbreaking industry, a source of lead pollution is mostly located there.
- ◆ In the circulated notice of DoE to prevent lead contamination of old or useless lead-acid batteries, as per the Section 6A of Bangladesh Environmental Protection Act 1995 and through SRO No. 175-Act / 2006 and SRO No. 29-Act / 2008, the Government has imposed conditions on collection and recycling activities and management.

- ◆ The Minister has acknowledged the severity of the lead pollution and expressed to develop projects mitigating this issue as soon as possible.
- ◆ Shamim Al Razi gave the following recommendations as steps to prevent lead pollution:
  - The Department of Environment and other relevant government bodies will commit to joining existing multi-stakeholder platforms focused on lead, to facilitate regular communication and coordination across Ministries, NGOs, research teams, and institutions.
  - Support the transition of used lead-acid batteries from informal recycling to registered facilities, and ensure registered facilities are operating to high environmental performance standards.
  - Immediately identify community areas contaminated with lead, where children are being put at risk for disability, and develop a plan to fix them and return them to as a safe place.
  - The way the Government is increasingly monitoring and imposing taxes and fines for the pollution of water by the industrial units to prevent the loss of surface and groundwater quality due to the removal of untreated waste by various industrial units. Similarly, especially soil contamination by lead pollution should be monitored and enforced by the ministry.
  - The other means of lead contamination discussed in the workshop need more in-depth research.
  - Organize various trainings and workshops to enhance the skills of different stakeholders.

***Concluding remarks by the Chair and meeting adjournment: Mr. Ashraf Uddin, Director General, Department of Environment (DoE)***

- ◆ Achieving sustainability goals is one of the six main goals of the Eighth Five-Year Plan of the country. With that goal in mind, the Bangladesh government has given priority to reducing air and water pollution, increasing greening, and conserving biodiversity.
- ◆ To conduct mobile court against the person/ organization violating the Environmental Protection Act and rules and to take legal action by filing a case in the Environmental Court; to encourage people's participation in environmental protection and management, the ministry is actively carrying out various activities including establishing partnership activities with various social, cultural and economic groups.
- ◆ The government is taking initiatives against unauthorized ULAB recycling factories and organizations through mobile courts. Recently 16 such operations were destroyed.
- ◆ There is a need for greater awareness both within the government and among the public.
- ◆ Lead must be addressed as its damage to the human body and environment is irreparable.
- ◆ The recommendations and solutions that have emerged from today's discussion to prevent lead pollution have led us to do more research in this area in the future and will play a helpful role in carrying out effective initiatives.

## NOTABLE QUOTES FROM THE SPEAKERS

### **Abdullah Al Mamun, Chemical and Waste Management Unit, DoE**

“We know what the problem is and we have to act on it. The Bangladesh Government is very serious on this issue.”

“Pure Earth and the Government has been working closely for a long time to combat this disaster, especially in controlling the sources of lead, reducing exposures, and identifying and treating lead-poisoned children.”

“The Coordination Committee could be formed in the Ministry and a Technical Committee could be formed under the leadership of the DG DOE. This model was used for plastics pollution.”

### **Andrew McCartor, VP, Strategy and Partnerships, Pure Earth**

“The first reason for this workshop is that it is our perception that there is still a lack of coordination amongst all the stakeholder groups... The second reason for this workshop is that the available data are fairly concerning. Both informal battery recycling and spice adulteration with lead chromate has been extensively researched and have shown to be quite severe issues.”

“I’m particularly encouraged to hear Dr. Sadat say that the government will be establishing a multi-sectoral committee for networking and collaboration. That’s exactly the type of next step that we hope could emerge from this workshop and it is certainly part of the recommendations of the Lead Pollution and Health Roadmap.”

“We have visited many communities that have allowed illegal battery recycling in their communities and their back-yards, without understanding that such activity will damage their children and community. So greater awareness in the public would help prevent such operations finding a home.”

### **Dr. Shahriar Hossain, Environment and Social Development Organization (ESDO)**

“We are talking about the lead in batteries and paint, but we don’t talk about the lead in products, particularly for consumer products and essential products.”

“High levels of lead have been detected in rice and vegetables. A recent study by Bangladesh Agricultural University found that food groups of cereal, fish, meat, fruits, vegetables, and spices are highly contaminated with lead.”

**Dr. Anwar Sadat, DPM, Planning, Monitoring and Research (PMR), DGHS**

“Even though Bangladesh is one of the most impacted countries, there is no routine evidence generation system in the government system of Bangladesh. All the presentations that we have seen here have been conducted by our development partners or research institutions.”

“We have to establish blood level monitoring and integrate blood lead data into MOH’s routine health information system, such as DHIS2... This requires investment to bring the equipment needed to conduct the testing at district or division levels.”

“We request Ministry of Environment and Ministry of Industry to conduct a Situational Analysis in their sectors, so this evidence can be used to collaborate and create a strong movement.”

**(Chair) Mr. Ashraf Uddin, Director General, Department of Environment (DoE)**

“We are unknowingly eating and breathing poisonous lead. The common people of the country and all our families need to be aware of this and talk about it. We need to work together to solve this global problem, and I think Pure Earth opened that door with today's event.”

“We need to raise public awareness about how the lead is increasing our environmental and health risks through industrial pollution in our communities, in spices and other foods, and through other products. Lead is a silent killer. Its damage to the human body and environment is irreparable.”

**(Chief Guest) Ahmed Shamim Al Razi, Additional Secretary, Ministry of Environment, Forest and Climate Change**

“The Department of Environment should take the lead to eradicate lead exposure from Bangladesh, as it is a very detrimental and harmful substance for the human body.”

“The whole earth is shivering from the threat of Covid 19, but the threat of lead and other pollutants can in no case be underestimated. Lead is the silent killer, unlike COVID-19.”

“From today, I declare that I am taking cognizance of this issue and we shall frame projects so that we can drive the eradication of lead exposures as soon as possible.”

## QUOTES FROM THE PARTICIPANTS

**Md. Zia-ul Haque, Department of Environment:** “We need to develop a national inventory on lead pollution sources. At the same time, we should prepare a comprehensive lead pollution abatement study and a time-bound action plan with a specific goal to achieve.”

**Dr. Minjoon Kim, UNICEF:** “With this collaboration from other sectors, UNICEF wants to support the Ministry of Health to develop a higher strategy note on environmental health, with focus on lead poisoning, so that no one is left behind for development.”

**M H Faruquee (stated in the chatbox):** “There is another aspect to work to improve the workplace environment in the recycling industries and gradual rehabilitation of workers engaged in these industries.”

**Dr. Rehnuma H Sarah (stated in the chatbox):** “As we all are aware, the number of informal ULAB sites numbers is more than 2000, so we can imagine how much loss of biodiversity around those sites. But there is hope; we have low-cost materials for phytoremediation of the soil like household waste, pond mud, wood chips, grass, etc. I think authorities may consider this bioremediation in the SRO ASAP before losing our biodiversity. Glad to see people are concerned about the health impacts but we should conserve our nature too!”

## RECOMMENDATIONS

1. A multi-stakeholder approach with the leadership of the relevant government ministries should be established to eradicate community lead exposure. The Department of Environment (DoE) should take the lead in a joint, multi-stakeholder approach to eradicating lead pollution. A coordination committee could be formed in the Ministry of Environment, Forest, and Climate Change, and a technical committee can be formed under the leadership of the Director-General of DoE.
2. The relevant government departments and ministries that should work closely on this issue are the Ministry of Environment, Forest and Climate Change, the Department of Environment, the Ministry of Health, the Ministry of Commerce, the Ministry of Industry, the Local Government Division, and the Food Safety Authority.
3. A time-bound, holistic national action plan which considers existing legislation is needed to advance progress on the issue of lead exposure. This action plan should include provisions for monitoring, reporting, and enforcement.
4. Comprehensive lead pollution studies and a national inventory on lead pollution sources are key to prioritizing effective exposure mitigation projects. This research is needed to identify polluting industries and lead-containing consumer products.
5. Effective monitoring by relevant agencies is needed to identify lead exposure sources, develop interventions, and ensure long-term success. This is needed for both industrial sources (e.g., the closure of informal ULAB sites), as well as in products (e.g., lead chromate adulteration in spices).
6. Interventions in the ULAB recycling sector should be prioritized as this is a major known source of community lead exposure. Research institutions and universities should come up with ways to shift illegal, informal ULAB recycling industries to the regulated, registered sector. Second-generation lead-acid batteries or alternatives such as lithium-ion batteries should be examined for application in Bangladesh.
7. Occupational health and safety hazards of working with lead need more attention; workers who are working directly with lead require additional education. For those workers engaged in informal lead industries, alternative livelihoods should be explored as more of the industry shifts to the formal sector.
8. Ensuring effective waste management across all sectors, especially industrial waste is important because contaminated waste ends up affecting health through different pathways, including the agricultural chain.

9. Blood lead monitoring must be established. Blood lead data could be integrated into the MOHFW's existing routine health information system, DHIS2. Investment is needed to conduct this testing at district and division levels. Blood lead data can be used to identify contributing sources and monitor the efficacy of interventions.
10. The capacity of health workers and the health care sector to address lead exposure should be expanded.
11. Sensitization through print and electronic media plays a crucial role in creating public awareness about the sources and effects of lead pollution and spurring government bodies to act. There should be various training sessions and workshops to enhance the knowledge and skills of stakeholders related to lead pollution.

## CONCLUSION

The main goal of the workshop is to bring together the various stakeholders of lead pollution to come together on a unified strategy that has been largely successful. The representatives from the various departments of government acknowledged the devastating social, health, and economic impacts of lead pollution, and agreed that better surveillance and public awareness are needed going forward.

The group highlighted current capacity gaps in national exposure and blood lead level surveillance. The important roles of the media and local governments in working with the public were also highlighted. It was decided that the Department of Environment (DoE) will take the lead in a multi-stakeholder initiative for the eradication of lead exposure in Bangladesh, with cooperation from the Ministry of Health, Ministry of Commerce, and local development governments.

## ANNEXES

**Relevant workshop documents are available at this [link](https://drive.google.com/drive/folders/1kY0Mz-KK50r6QthyrA5N_tnURAE5jiZT?usp=sharing):**

[https://drive.google.com/drive/folders/1kY0Mz-KK50r6QthyrA5N\\_tnURAE5jiZT?usp=sharing](https://drive.google.com/drive/folders/1kY0Mz-KK50r6QthyrA5N_tnURAE5jiZT?usp=sharing)

**Annex A:** Presentation on the Background and efforts to date

**Annex B:** Presentation on the Lead exposure sources: current status and needs

**Annex C:** Presentation on the Opportunities in the health sector

**Annex D:** Presentation on the Findings on next steps

**Annex E:** Workshop Agenda and Discussion Summary

**Annex F:** Draft of the Lead Health Roadmap Strategy Paper

**Annex G:** Zoom Recording of the event

**Annex H:** Chat history of the event

**Annex I:** List of guests and participants

**Annex J:** Photos of the event

**Annex K:** Media coverages of the event

**Annex L:** Social media and visibility materials of the event