Foreword

Lead (Pb) is a naturally occurring element found in the Earth's crust. Lead is a cumulative toxicant that affects multiple body systems and is particularly harmful to young children**.** Lead exposure can cause high blood pressure and brain, kidney and reproductive issues in adults. Lead poisoning is defined as a deleterious effect of a gradual accumulation of lead in body tissues, as a result of repeated exposure to lead containing substances. Lead poisoning is usually caused by eating or drinking (ingesting) lead contaminated substances, and/or touching or breathing in toxic metal.

The 2010 Lead poisoning experience in Zamfara State, in Northern Nigeria was a call for action. By May 2010 public health officials learned that hundreds of children had become sick and presented with vomiting, abdominal pain, headaches, and seizures. About 400 children died and several others were disabled (MSF, 2012). A diagnosis of Lead poisoning was later made, and a team of experts from FMoH, MSF, AFENET, UNICEF, CDC, WHO and a host of others promptly responded. Similar outbreak was experienced in Niger state in 2015 and was brought under control.

The widespread use of lead has resulted in extensive environmental contamination, human exposure and significant public health problems in many parts of the world including Nigeria. Exposure to children can result from multiple sources and can cause irreversible and life-long health effects. Lead in the body is distributed to the brain, liver, kidney and bones. It is stored in the teeth and bones, where it accumulates over time.

Young children ages 1-5 years are particularly vulnerable to the toxic effects of lead. There is no level of exposure to lead that is known to be without harmful effects; therefore, no safe blood lead level (BLL) in children has been identified. Low levels of lead in blood have been shown to affect Intelligent Quotient (IQ), that is, inability to pay attention and achieve academic excellence. Several children are exposed to high levels of lead through various means.

The Policy will help Federal Agencies to work strategically and collaboratively to reduce exposure to lead and improve children's health. It builds upon previous work of the relevant stakeholders to address lead exposure in children.

This policy will build Nigeria to a place where children, especially those in vulnerable communities, live, learn and play protected from lead exposure and its harmful effects.

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ABBREVIATIONS AND ACRONYMS

AFENET	African Field Epidemiology Network
ASGM	Artisanal and Small-Scale Gold mining
BLL	Blood Lead Level
BLRV	Blood Lead Reference Value
CDC	Center for Disease Control and prevention
CFR	Case Fertility Rate
DSNO	Disease Surveillance Notification Officer
EP	Erythrocytes Photoporphyrin
FCCPC	Federal Competition and Consumer Protection Commission
FMOE	Federal Ministry of Education
FMoEnV	Federal Ministry of Environment
FMoH&SW	Federal Ministry of Health and Social Welfare
FMWR	Federal Ministry of Water Resources
FMARD	Federal Ministry of Agriculture and Rural Development
GAP	Good Agricultural Practices
HCW	Health Care Workers
HP	Haemoglobin Screening
IEC	Information Education and Communications
IQ	Intelligent Quotient
LEPAC	Lead Exposure and Prevention Advisory
LGA	Local Government Area
MDAs	Ministry Department and Agencies
M&E	Monitoring and Evaluation
NSDWQ	Nigeria Standard for Drinking Water Quality
MSF	Médecins Sans Frontières
NAFDAC	National Agencies for Food and Drugs Administration and Control
NAQS	Nigeria Agriculture and Quarantine Services
NCDC	Nigeria Center for Disease Control
NESREA	National Environmental Standards and Regulations Enforcement Agency
PPE	Personnel Protective Equipment
PPM	Parts Per Million
SMoH	State Ministry of Health
SON	Standard Organization of Nigeria
TBA	Traditional Birth Attendant
UNICEF	United Nation Children Emergency Fund
WHO	World Health Organization

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Chapter 1: INTRODUCTION

Lead (Pb) is a naturally occurring toxic metal found in the Earth's crust that affects multiple body systems in humans and is particularly harmful to young children. The widespread use has resulted in extensive environmental contamination, human exposure, and significant public health problems in many parts of the world including Nigeria. The WHO has identified lead as 1 of 10 chemicals of major public health concern, needing action by Member States to protect the health of workers, children, and women of reproductive age. However, its exposure is preventable.

Lead can accumulate in the body if it is ingested and inhaled. It can also enter through splits in the skin or through mucous membranes. It can damage the heart, bones, kidneys, teeth, intestines, reproductive organs, nervous and immune systems.

Lead in the body is distributed to the brain, liver, kidney, and bones. It is stored in the teeth and bones, where it accumulates over time (Arowolo and Bamgbose, 2004).Young children ages 1-5 years (CDC, 2017) are particularly vulnerable to the toxic effects of lead (because they absorb 4–5 times as much ingested lead as adults) and can suffer profound and permanent adverse health effects, particularly affecting the development of the brain and nervous system. Children with elevated blood lead levels are likely to be aggressive, violent and deliquescent (Dapul and Laraque, 2014). Lead also causes long-term harm in adults, including increased risk of high blood pressure and kidney damage.

Lead exposure can have serious consequences for the health of children, affecting the brain and central nervous system to cause coma, convulsions and even death. Children who survive severe lead poisoning may be left with mental retardation and behavioural disorders. Lead exposure also causes anaemia, hypertension, renal impairment, immunotoxicity and toxicity to the reproductive organs. The neurological and behavioural effects of lead are often irreversible. Exposure of pregnant women to high levels of lead can cause miscarriage, stillbirth, premature birth, and low birth weight (WHO, 2010; Yahaya et al., 2014)

African children have been identified as a group susceptible to high risk of exposure, often simultaneously, to multiple sources of environmental lead (Mathee, 2014). Undernourished children are more susceptible to lead poisoning because their bodies absorb more lead if other nutrients, such as calcium or iron, are lacking (Lead report 2019). Children at highest risk are the very young (including the developing fetus) and the economically disadvantaged.

Lead exposure to humans can result from multiple sources and can cause irreversible and life-long health effects. These Policy and Action Plan focus on reducing exposures from lead

sources and associated health impacts that pose serious and urgent threats to children, especially in high-risk communities.
The sources of environmental contamination of lead include mining, smelting, manufacturing and recycling activities. In some countries, the continued use of leaded paint, leaded gasoline, and leaded aviation fuel are possible sources of Lead exposure. Globally, more than three quarters of lead consumption is from manufacture of lead-acid batteries for motor vehicles (ISDC, 2014). Other household sources of lead products are cosmetics, toys, medicines etc. and could be found in drinking water delivered through lead pipes.

Several mitigating measures shall be initiated by the Federal Ministry of Health as well as other line ministries to reduce the disease burden. The mitigating measures include the following interventions:
Environmental remediation of contaminated soil surface, advocacy, safer mining measures, legal framework, capacity building initiatives for the communities, periodic monitoring and evaluation of surface soils and water chain to prevent re-contamination, establishment of community health service and frequent monitoring of Blood Lead Levels (BLLs)

Some of the factors promoting this are poverty and ignorance of the consequences of exposure to Lead by the affected communities. It will be difficult to stop mining completely in Nigeria since it is an important source of income. Hence, it is imperative to make mining safe for the communities. To this effect, the Federal Government and Development Partners have continuously conducted training of health care providers in the affected communities. This action has promoted community awareness and sensitization to the residents of the area. These interventions have prevented many deaths, and thousands of children including the disabled who were exposed to lead and treated.

Therefore, these interventions provide an opportunity to re-orientate Health officers and other stakeholders who have been at the forefront of ensuring that Lead poisoning ceases to be a major public health challenge in the country.

1.1 Global Perspective of Lead Poisoning

Lead poisoning is otherwise called plumbism. It refers to the deleterious effect of a gradual accumulation of lead in body tissues. Lead is a cumulative toxicant that affects multiple body systems such as brain, liver, teeth, kidney, bones, and reproductive systems. Exposure to high levels of lead may cause anaemia, weakness, kidney, and brain damage. It is particularly harmful to young children (due to their hand-to-mouth behaviour) resulting in reduced intelligence quotient (IQ), behavioural changes such as reduced attention span and increased anti-social behaviour.

WHO guideline/safety limits for clinical management of lead in blood is 5 µg/dL, but there is no known safe level of lead in the human body. Lead poisoning therefore is of significant global public health concern. The WHO estimates that 240 million people are over exposed and 99% of those with blood levels above 20µg/dL are in the developing world. The greatest burden is in low- and middle-income countries.

1.2 Situations of Lead Exposure in Nigeria

In Nigeria mass lead poisoning incident occurred in 2010 in Zamfara State due to unsafe mining and ore processing. This led to the deaths of more than 400 children in three months (Figure 1). More than 2,000 people needed intensive therapy, after high levels of lead were found (MSF, 2012).

The lead exposure in Nigeria was first reported by a DSNO in Anka LGA from Zamfara State. They observed an abnormal increase in infant mortality in Dareta and Yargalma villages of Anka and Bukkuyum Local Government Areas, respectively. Initially, the deaths were thought to have been caused by malaria but when the patients were not showing positive response to treatment, the medical team had to change their approach.

Consequently, the blood samples of the victims which were sent to Germany for analysis indicated the cause of the strange ailment to be an abnormal high level of lead (Pb) in the bloodstream of the victims. Further investigation by Zamfara State Ministry of Health and Médecins Sans Frontières (MSF) confirmed the presence of high levels of lead in the blood samples collected from the gold miners and processors. Further surveillance activities led to the discovery of lead poisoning in fifteen other local government areas where there were gold mining activities in Zamfara State.

Exposure to lead is not only confined to the Zamfara State incident. The Federal Ministry of Health notified the WHO of the suspected lead poisoning outbreak in Ungwa Maigero and Ungwa Kawo communities in Rafi LGA of Niger State in May 2015. A total of 48 cases including 14 deaths (CFR 29.2%) were reported.

A second heavy metal poisoning occurred in 14 LGAs in Zamfara State in the year 2024. A total of 697 cases and 13 deaths (CFR= 2%) were recorded. Shinkafi LGA reported a total of 341 cases and Maradun, 142. Other LGA with at least 10 cases were Zurmi 49, Bungudu 39, Anka 36, TalataMafara 32, Gusau 17, Kaura Namoda 11, Bakura 12. Other LGAs with cases are Gummi, TSafe, Birni Magaji, Bukkuyum and Maru. Heavy metals detected in high quantity were mainly Arsenic and Lead, however Mercury, Cadmium, Chromium and Manganese were also present.

The outbreak of heavy metal poisoning in Sokoto state was first reported on the 20th of March 2024 from Isa LGA. Patients reported with abdominal distension, abdominal pain, vomiting, fever and difficulty in breathing. Majority of the cases were children and young adults, ages 5-14 were more affected. Active search for cases by the state rapid response team, revealed cases from thirteen additional LGAs (Illela, Sabon Birni, Tambuwal, Gwadabawa, Kware, Silame, Wamakko, Shagari, Yabo, Tureta, Kebbe, Gudu and Dange Shuni). Of the thirteen LGAs only Sabon Birni shares border with Isa LGA). A total of 713 cases have been reported with 53 deaths (CFR:7.2%). Kware and Tambuwal LGAs have higher CFR of 33% and 22% respectively. About half (79%) of the children were from households whose parents' occupation is farming. Blood and ascetic fluid samples from cases showed high levels of Lead, Chromium, Cadmium, Cobalt and Arsenic. Water samples from open wells and boreholes showed high levels of lead with significant amount of cadmium and chromium from the wells and borehole respectively. Soil samples from farm, open well and boreholes showed high concentration of Cadmium and significant level of lead. Samples from water melon leave, fruits and tomato fruits showed very high concentration of lead. The response being coordinated through an incident management system with multi agencies and partners' participation. The ongoing activities include intensified surveillance with active search for cases, case management using palliative approach and sensitization of communities in affected and non-affected LGA.

Figure 1: Grave of Young Children, Observed

Photo Credit Zamfara State

Figure 2: Stomach Distension Due to Heavy Metal Poisoning

Chapter 2: MAIN GOAL: ESTABLISHING POLICY ON LEAD USE

The Federal Government of Nigeria has develop an Action Plan which shall be used as a template to address the problems of lead poisoning in the country.

The Action Plan has four goals with key priorities and objectives that seek to reduce harm to humans from exposure to lead. By identifying specific goals and actions, the Federal Ministries of Health, Environment, Mines and Steel Development, Agriculture and Rural Development, Water Resources and other relevant MDAs will prioritize their efforts and monitor progress of implementation.

The four specific goals are:

i. Reduce human exposure to lead sources.
ii. Identify lead-exposed persons and improve their health outcomes.
iii. Communicate more effectively with relevant stakeholders.
iv. Support and conduct relevant research to inform efforts to reduce lead poisoning

Our Vision

To ensure Nigeria becomes a place where children, especially those within vulnerable communities, live, learn and play protected from the harmful effects of lead poisoning.

Policy Trust

The Federal Ministry of Health and Social Welfare (FMoH&SW) has developed a national policy and action plan document for lead poisoning control. This document was developed based on situation reports on lead poisoning in some States in Nigeria, and a series of meetings with experts, advocates and community members. The (FMoH&SW) was saddled with the responsibility of developing Lead Poisoning Elimination Policy and Action Plan for inclusion in documents related to public health. Noting the urgency of the responsibility, the (FMoH&SW) developed this policy with the strongest evidence base. Priority was placed on actions that are related most directly to preventing children from coming into contact with lead, and enabling those who are already been exposed to access medical services to help them live.

Declaration and Commitments

The policy guides key Stakeholders regarding reduction of human exposure to lead sources and prompt identification of lead exposed persons for improved health outcomes.

2.0 Reduce Human Exposure to Lead Sources

2.1.1 Lead Exposures and Related Health Risks

Lead exposure can have serious consequences for the health of children, affecting the brain and central nervous system to cause coma, convulsions and even death. Children who survive severe lead poisoning may be left with mental retardation and behavioural disorders. Lead exposure also causes anaemia, hypertension, renal impairment, immunotoxicity and toxicity to the reproductive organs. The neurological and behavioural effects of lead are often irreversible. Exposure of pregnant women to high levels of lead can cause miscarriage, stillbirth, premature birth and low birth weight (WHO, 2010; Yahaya et al., 2014)

Undernourished children are more susceptible to lead poisoning because their bodies absorb more lead if other nutrients, such as calcium or iron, are lacking (Lead report 2019). Children at highest risk are the very young (including the developing fetus) and the economically disadvantaged.

2.1.2 Common Sources of Lead Exposure

Lead is widely found in both the formal and informal sectors (including small scale industries) in Nigeria, as well as in some traditional practices (Figures 2-3).

Soil: Lead released from combustion of leaded gasoline, deterioration of lead-based paint, indiscriminate and unsafe disposal of battery waste, artisanal mining and smelter emissions, and other industrial sources can become airborne and eventually settle onto the surface soil. The accepted safety standard for soil in residential areas is 400 parts per million (ppm) in play areas and 1200 ppm for non-play areas (US-DHUD, 2012).

Water: Lead solder that is used to hold copper pipes together can contaminate drinking water. Municipal water supplies are usually regulated to prevent contamination at the source, but lead can leach into the water supply that is delivered to homes when older fixtures are corroded. In 1991, the EPA published the Lead Rule to control the amount of lead in drinking water. The EPA "action level" of lead in water is 15 ppb. This is unlikely to cause clinically significant elevation of BLL in adults; however, children may be more susceptible to lead poisoning because of their relatively smaller body size and slow body metabolism. Above this level, the lead exposure can cause cancer, interfere with vitamin D metabolism, affect mental development in infants to the central and peripheral nervous systems. The Standard organization of Nigeria (SON) stipulated lead level in drinking water to be 0.01 mg/L. Sinkers in subsistence fishing communities may be sources of lead contamination.

Food: Lead makes its way into food products during its production, handling, packaging, preparation, and/or storage. Lead from the air deposits onto soil and results in the contamination of any agricultural produce that is grown on it. Lead solder that is used during the canning process finds its way into food. Imported spices from other countries that are not tested for lead content also can contaminate food during its preparation. Food stored, prepared, or served in lead crystal, lead-glazed pottery, or porcelain can as well be contaminated.

Children's toys, Cosmetics and Recreation Materials:
Children's toys, jewelries and furniture used at recreation centres may contain lead-based paint. Many lipsticks and cosmetics are manufactured using lead. Contact with these objects presents a low risk of contamination; however, ingestion of these products via chewing and/or swallowing may cause lead poisoning.

The role of lead as a neurological toxin is well established. Lead exposure has been associated with reductions in intelligence scores, hearing loss, hyperactivity, shortened concentration spans and poor school performance in children, as well as lowered lifetime earnings. In recent years, several studies have linked lead exposure to aggression or violent behaviour. In the light of growing evidence of the lack of a threshold of safety for lead in blood, there have been calls for a lowering of the blood lead level.

African children have been identified as a group susceptible to high risk of exposure, often simultaneously, to multiple sources of environmental lead (Mathee, 2014). Incidences of large-scale lead poisoning in Zamfara and Niger states in Nigeria from informal gold mining and dismantling of batteries in Dakar, Senegal have highlighted the vulnerability of Africans in this regard (Umar-Tsafe, 2019). A three-month investigation uncovers the recycling of Lead-Acid batteries and its poisoning effects on air, soil and water in Ogun and Lagos States leading to high Lead Blood Level of an average of 3.7µg/dl among recyclers (Isaac Anyaogu and Petra Sorge, 2018). Inspite of the evidence of serious lead exposure in Nigeria, there is no comprehensive lead poisoning prevention, or even National Blood Lead surveillance, programmes and policy.

Leaded Paint: White house paint was 50.0% lead before the 1950s and this has informed why old houses were of high risk for Lead exposure. In 1971, the maximum permissible Lead level in paint was reduced to 1.0% and by 1977 it was down to 0.06% (Lanphear et al., 2002, Laraque and Trasande, 2005;). Although most homes have since been repainted with nonleaded paint, lead may still be released into the homes during renovations either through peeling, chipping or cracking. Therefore, lead exposure to humans can be traceable to ingested paint chips, household dust containing Lead, which may be inhaled or ingested by children via hand-to-hand activities. In Nigeria the permissible level of lead in paint is 90 ppm (NIS/ISO3856-1)

Gasoline: The combustion of leaded gasoline has been responsible for most lead exposure through inhalation.

2.1.3 Local Sources of Lead and Exposure

The sources of environmental lead and exposure are lead-based paint (Dewalt et al., 2015), welding, artisanal mining, leaded petrol, aviation fuel, lead contaminated dust, potable water in lead pipes, ground water, packaged water, household products like cosmetics, toys, medicines and others and use of some traditional medicines.
Exposure to lead is through inhalation and ingestion from occupational and environmental sources (Figure 4). The pregnant women, children and the elderly are more vulnerable to lead exposure.

Figure 3: Rock Ore Mining

Figure 4: Rudimentary Methods of Mining

Figure 5: Other Rudimentary Methods of Mining

Figure 6: Remediation in Affected Communities

2.2 Identify Lead-Exposed Persons and Improve Their Health Outcomes

2.2.1 Government action plan for reducing lead poisoning.

The Government Action Plan to Reduce Childhood Lead Exposures and Associated Health Impacts (Action Plan) is a blueprint for reducing lead exposure through collaboration among government structures, agencies and with a range of stakeholders, including states, and local communities, along with businesses, property owners and parents.
The Action Plan will help the Government to work strategically and collaboratively to reduce exposure to lead and improve children's health.
Lead exposure is a significant public health concern for some children because of persistent lead hazards in the environment.

Children may also be exposed to lead through:

- Ingestion of contaminated food.
- Use of folk-remedies,
- Cultural and consumer products.
- Recreational activities and take-home exposures from workplaces

2.2.2 Government Target

Target acceptable level by 2030 – United Nations proposes the target acceptable blood lead level in humans to be at zero level by 2030. Nigeria Government remains a signatory to the SDGs and should work towards the goal (UN Goal)

By 2025, children's blood lead "level of concern" shall be testing result of 10 micrograms per deciliter (10 µg/dL). From 10ug/dl and above, the children shall be considered for case management.

2.2.3 Determination of tolerable blood level/safety limit

The National Institute of Occupational Safety and Health recommended a lead blood level of <60 µg /dL of whole blood in mining workers.

2.2.4 Establishment of Designated Centres for Blood Lead Level Measurement

CDC uses a population-based reference value to identify children with BLLs greater than 97.5% of the children ages 1 to 5 years (CDC, 2017). The blood lead reference value (BLRV) is not a clinical reference level defining an acceptable range of blood lead levels in children nor is it a health-based toxicity threshold; rather it is a policy tool that helps identify the children in the upper end of the population blood lead distribution in order to target prevention efforts and evaluate their effectiveness.

The current CDC BLRV is 5 µg/dL based on the 97.5th percentile of the distribution of blood lead levels (BLLs) for children ages 1 to 5 years, the estimated 97.5th percentile of blood lead level is 3.5 µg/dL (Caldwell et al., 2017).

The risk for lead exposure is not the same for all children; data show disparities in exposure by sociodemographic characteristics and geographic location (Roberts et al., 2017; Hanna-Attisha et al., 2016; CDC, 2013; CDC, 2016).

Furthermore, the relative contribution of various exposure media (e.g., house dust, soil, drinking water, food, air) to BLLs can vary by childhood age and between those children with elevated BLLs versus lower BLLs (Zartarian et al., 2017).

2.3 Communicate More Effectively with Relevant Stakeholders

Several actions are to be integrated from the Federal to State and Local Government Areas, and community stakeholder groups so that the intended benefits reach target populations such as pre-school and low-income children and their caregivers, health educators, school officials, industrial workers, and renovation contractors.

2.4 Support and Conduct Relevant Research to Inform Efforts to Reduce Lead Poisoning

There is dearth of information, publication, and research on control of lead poisoning in humans in Nigeria. Surveillance data is limited as per the incidence and prevalence of lead poisoning cases in Nigeria, therefore, there is need to determine adequate case detection where lead poisoning is occurring in the 19 artisanal and small-scale gold mining states in Nigeria.

Figure 7: Treatment / Case Management

Chapter 3: ROLES OF GOVERNMENT, AGENCIES AND PARTNERS

The Federal Government has identified actions to further reduce exposures to lead and associated health impacts, especially for those localities at greatest risk.

3.1.1 Federal Ministry of Health:

- Lead Poisoning Control in Nigeria
- Control lead poisoning in humans in collaboration with States in ensuring zero level of lead in human blood in line with UN SDG, 2030.
- Control lead poisoning in all products in conformity with Chemicals Management Division mandates of Food and Drugs Department
- Create awareness to both the health care workers and communities in identified mining areas.
- Conduct operational research.
- Enforcement of laws and regulations

3.1.2 NCDC

- Conduct Lead poisoning and other heavy metal surveillance.
- Respond to cases of Lead Poisoning in collaboration with FMOH.

3.13 NPHCDA

- Conduct oversight functions on the identified Primary Health Care Centres identified as treatment centres.

3.1.4 NAFDAC:

- Ensure regulatory control and enforce compliance with maximum permissible level of lead in both local and imported food, and cosmetic products.
- Ensure use of appropriate food grade contact materials for processes and packaging of food and food products
- Ensure adequate labeling of food, cosmetics, toys, and other regulated products.
- Conduct sensitization workshops on good hygienic practices, food, and chemical safety strategies.

3.1.5 Ministry of Mines and Steel Development:
Establishment of safer mining programme

- Identify and formalize the informal miners.
- Build their capacity.
- Sensitize them on safer mining.
- Equip them with the necessary gadgets and PPEs.
- Establishment of mineral processing center

3.1.6 Federal Ministry of Environment in conjunction with NESREA:

- The Federal Ministry of Environment in conjunction with other relevant MDAs shall co-ordinate remediation of sites contaminated by lead through the activities of Artisanal and Small-Scale Gold Mining (ASGM).
- The Federal Ministry of Environment shall ensure Sound Management of Chemicals including lead.
- Ensure cradle to grave management of lead in all sectors.
- Promote and encourage capacity-building with regards to dangers inherent in lead.

- Collaborate with relevant MDAs towards ensuring safer mining methods.
- Work collaboratively towards ensuring the elimination of lead in the environment.
- Initiate, coordinate and promote research activities on lead and its deleterious effects on humans and the environment in collaboration with relevant stakeholders.
- Regulate permissible levels of lead in the environment and this shall be enforced by the National Environmental Standards and Regulation Enforcement Agency (NESREA).

3.1.7 Federal Ministry of Agriculture and Rural Development:

- Sentinel to assess the extent of environmental contamination by lead poisoning and other poison.
- Participate in food safety management system via; Good Agricultural Practice (GAP)
  - Animal disease control Act (2022 amended)
  - Fish inspection and quality assurance regulation of 1995.
  - Agricultural control of importation and exportation Act (2003 amended)

3.1.8 Federal Ministry of Water Resources:

- Ensure provision of safe drinking water devoid of lead and other toxic metals to protect public health.
- Carry out routine water quality surveillance of drinking services producer.
- Carry out sensitization in mining communities of the health impact of lead in drinking water.
- Carry out special water testing in communities with reported cases of lead poisoning for appropriate investigation.

3.2 State Ministry of Health

- Create awareness to both the health care workers and communities in identified mining areas.
- Conduct operational research.
- Collaborate with other line ministries, department, and agencies.
- Funding of the Public Health Emergency Operational Centers (PHEOC)
- To carry out surveillance on health complications resulting from exposures to lead in mining areas.
- Community engagements and participation

3.2.1 SON:

- Regulate lead content in products.

3.2.2 FCCPC

- Ensure protection of consumers' rights and privileges

3.2.3 State Ministry of Environment

- Ensure implementation of legislation on lead level in paints and batteries
- Collaborate with relevant agencies to eliminate lead in paints.

3.2.4 State Water Agencies

- Provide safe drinking water devoid of lead and other toxic metals.

CHAPTER 4

4.0 Targeted Activities to Reduce Lead Exposure

Actions to reduce exposures to lead, fall under the following four interconnected goals:
Goal 1: Reduce children's exposure to lead sources.
Goal 2: Identify lead exposed children and improve their health outcomes.
Goal 3: Communicate more effectively with stakeholders.
Goal 4: Support and conduct critical research to inform efforts to reduce lead.

Goal 1: Reduce Children's Exposure to Lead Sources

Key Priorities: Reduce children's exposure to lead-contaminated soil, drinking water, lead- based paint and toys.

Impact:

Federal Ministry of Health efforts can further reduce childhood lead exposures by employing multiple coordinated approaches that include strengthening standards, strategic communication, surveillance, enhancing prevention and control measures to regulate the use of lead-based paints and implementing long-lasting infrastructure improvements.

Objective 1.1. Reduce Children's Exposure in Homes and Child-Occupied Facilities with Lead- Based Paint Hazards

- Exposure to lead paint in old housing and vehicles.
- Focus on structures including homes and locations outside the home where young children spend significant amounts of time.

Actions:

- Provide guidelines to address childhood exposures to lead-contaminated dust generated from lead-based paints.
- Develop regulations and empower relevant authorities that require individuals and firms conducting lead-based paint abatement, risk assessment or inspection to be properly trained and certified. Training programs are to be accredited, and these activities to be conducted according to reliable, effective, and safe work practice standards (EPA, NAFDAC, SON)
- Conduct lead-based paint inspections and risk assessments, abatement, and interim controls (SON, NESREA)
- Properly trained and certified staff are to conduct such actions in federally assisted properties; and

- Enhance direct collaboration with state and local governments on their development of lead paint hazard reduction strategies. (FMoH&SW, SON and NAFDAC)

Objective 1.2. Reduce Exposure to Lead from Drinking Water

Recognizing that no safe level of lead in drinking water had been established in Nigeria. To ensure lead free water, relevant MDAs (FMWR and NAFDAC) should collect water samples from relevant sources for water quality assessment.

- Develop strategies and adopt appropriate water treatment technique with a goal to reduce lead levels to the barest minimum in conformity to National and International Standards. (FMWRs, NAFDAC)

- Drinking water systems service providers (Water Board) must work with their customers to collect tap water samples not from locations with lead service lines and/or leaded plumbing materials.

Actions:

- Improve public health protection and reduce levels of lead in drinking water;(FMWR, SMWR, NAFDAC, FMOH&SW and SMOH)
- Engage the stakeholders to identify special water quality challenges, best practices and tools to address these challenges; (SMoH, SMWR, NAFDAC)
- Assist schools and childcare centers with the 3Ts approaches (Tell, Teach and Train) to reduce lead in drinking water (FME, FMWAs).
- To take actions that increase the number of schools and childcare centers that train and provide parents with information on how to minimize children's exposure to lead in drinking water;(FMoE, NOA, FMWAs, FMoH&SW, NAFDAC)
- The Federal Government in collaboration with stakeholders, to undertake assessment on all plumbing materials to ensure they are lead free FMWR, SMWR.
- Provide regulations and establish standards for lead content in plumbing materials used in new installations and repairs;(SON and NESREA).
- Routinely tests drinking water in schools at all levels of public institutions, homes and child care centers (NAFDAC).

Objective 1.3. Reduce Exposure to Lead in Soil

Lead can be a relatively common soil contaminant as a result of past and current human activities or uses (i.e. lead paint deposited in surface soil), and natural occurrence. Young children often have higher rates of soil and dust ingestion/ inhalation because of their unique behaviors such as crawling and hand/object-to-mouth contact.

As such, children who play in areas near former mining and smelting sites, manufacturing facilities, processing plants, landfills, and buildings with exterior lead-based paint may be exposed through incidental ingestion of small amounts of soil and inhalation of soil-derived indoor dust. Soil near roadways and in yards, playgrounds, gardens and elsewhere in the community may also be a source of exposure. Contaminated soil can also be tracked into the home.

Actions:

- Reduce childhood exposures to lead in soils through removal, remedial and corrective actions at contaminated sites and reduce lead soil exposures to the most vulnerable community residents.(FMoEnv and MMSD)
- Promote health education events to inform community members about the lead content of the soil in their immediate environments and best practices for safer gardening and prevention of childhood lead exposure (SMoH, SMoEnv, SMWR SMoE and Partners)
- The Federal Government to continue with the evaluation of lead exposure at contaminated sites and identify ways to protect the public's health. (FMoH&SW, MMSD, FMoEnv, FMWR).

Other Objectives: Addressing other sources of lead identified and enforcing laws to ensure compliance aimed at further reducing lead exposures.

Objective 1.4:Reduce Exposure to Lead Associated with Emissions to Ambient Air

Lead is still emitted into ambient air from a variety of sources, including metals processing facilities and combustion of leaded aviation fuel (avgas) by aircraft with piston engines. Also, it is found at lead smelting operations, such as battery recycling facilities and other metal processing facilities.

- Ensure air quality standard near primary artisanal miners and smelter.
- Emission monitoring
- Regular blood lead level surveillance

Actions:

- Create awareness of ambient lead air pollution and reduce childhood exposures to lead in air through removal of affected persons for treatment, analysis of air quality in communities contaminated with lead. Ensure the air quality meets with the permissible standards of Federal Ministries of Health and Environment (Research ongoing).

- Continuous monitoring of lead in the ambient air in the high-risk areas. The primary and secondary lead (Pb) standards are 0.15Ug (micrograms) per cubic meter lead in total suspended particles as a 3month average. (Federal Ministry of Environment and Health).

Figure 8: Environmental Management Remediation Using X-Ray Florescence

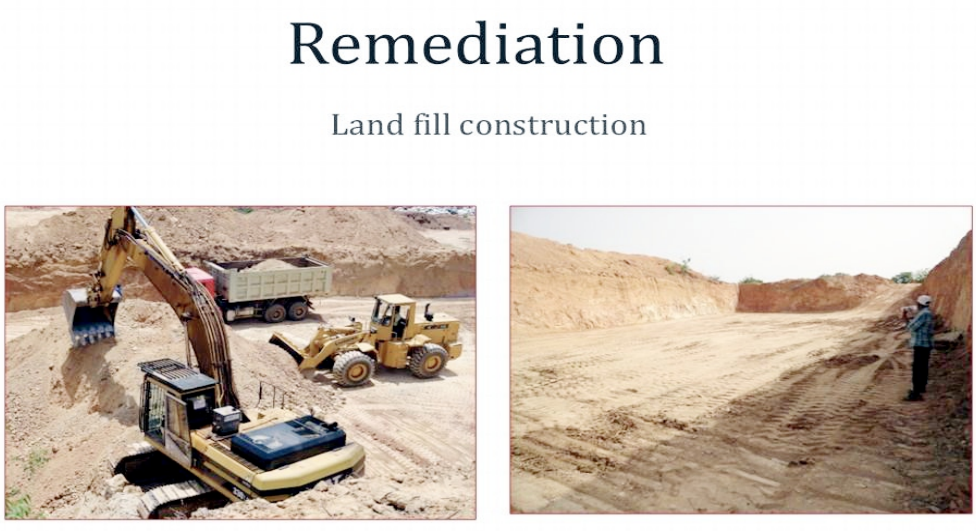

Figure : Environmental Management Remediation

Objective 1.5: Reduce Lead Exposure from Occupational Sources

The Occupational Health Safety Division of the Federal Ministry of Health and State Ministry of Health enforces workplace standards for lead that include a permissible exposure limit for workers' exposure to airborne lead. Provision of medical support for workers with elevated blood lead levels, in addition to other requirements.

Actions:

- Improve safety of workers in industries and occupations where preventable exposure to lead continues to occur. Children may be exposed to lead if their parents or adults in the household transfer lead from the workplace to their home or vehicle; and

- Reduce occupational exposure to lead, including take-home exposure to children, by incorporating information on such hazards and how to avoid them into training courses/materials (Federal Ministry of Health to collaborate with the Federal Ministry of Labour and Employment on reducing occupational hazards due to lead exposure).

Objective 1.6: Reduce Exposure to Lead in Food

- Promote good agricultural and manufacturing practices that can minimize lead contamination of food.
- Utilize food grade contact materials in the preparation and packaging of food and food products.

Actions

- Avoid agricultural activities on lead contaminated soils. This prevents transmission of lead from soil to agricultural produce (Legal Act); (FMARD)
- Strict adherence to regulatory control on the importation of food and food products packaging containing lead (NAFDAC, Nigeria Custom Service, SON and Nigeria Agriculture and Quarantine Service (NAQS).
- Periodic monitoring of locally processed and packaged food to ensure conformity to permissible lead limit in food products (NAFDAC, NAQS and SON);
- Periodic evaluation of the provisional tolerable total dietary intake level as a tool for assessing risk linked to exposure to lead in any particular food (NAFDAC and SON).
- Intensify monitoring of domestic and imported food for lead (NAFDAC and SON).

Objective 1.7: Reduce Exposure to Lead in Cosmetics and Personal Care Product

Lead may occur as an impurity in ingredients used in cosmetic products owing to background presence of lead in the environment and production materials.

Actions:

- Monitor domestic and imported cosmetics for lead impurities (NAFDAC, SON.
- Provide guidance and enforce compliance to permissible lead levels in cosmetic products (NAFDAC and SON)
- Provide maximum allowable level of lead in cosmetics not more than 10-20ppm (US-FDA)

Objective 1.8: Reduce Exposure to Lead in Consumer Products

The Federal Ministry of Health should collaborate with relevant regulatory government agencies (NAFDAC, SON) to ensure maximum compliance with allowable lead limit in consumer products (furniture, articles, children's toys and other articles intended for use by children that bear lead-containing paint).

Actions:

- Enforce regulations regarding lead content in consumer products (NAFDAC and SON)
- Enforce labeling requirements to prevent consumer product-related lead exposure (NAFDAC and SON)
- The FMOH&SW should work with regulatory bodies such as NAFDAC, SON to ensure foreign suppliers' compliance with Nigerian lead content requirements.

Objective 1.9: Reduce Lead Exposure through Enforcement and Compliance Assistance

Regulatory agencies and the Ministry of Justice should enforce the laws that help reduce the sources of lead in children's environments. The options may include formal or informal administrative actions by the regulatory agency or judicial enforcement through a referral from Epidemiology Division of FMoH&SW/NAFDAC for a civil enforcement action or criminal prosecution.

Institute compliance assistance for homes and child-occupied facilities with lead-based paint, lead-contaminated drinking water, and lead-contaminated soil.

Actions

- Supports regulatory agencies' focus on addressing lead exposures; (Ministry of Justice)
- Strict enforcement of the law by relevant agencies at all levels (NAFDAC, NESREA, SON)
- Prioritize action on referred cases to agencies about potential childhood exposure to lead, particularly when these cases are time sensitive and require rapid action to protect human health (FMoH & SW, MMSD, FMWR, FMoEnv)
- Coordinate and collaborate with states, agencies, and local governments to share information and develop enforcement cases. (FMoH & SW, FMoEnv, FMWR, MMSD)

Goal 2: Identify Lead-Exposed Children and Improve Their Health Outcomes

Key Priorities: Improve identification of children exposed to lead through surveillance and foster access to services and support designed mechanisms to promote children's physical, developmental and mental health. Ideally, these services would be provided through a patient-centered medical coordinated system of care.

Objective 2.1: Strengthening Surveillance of Blood Lead Levels (BLLs) to Identify Children Exposed to Lead
Children can be investigated for blood Lead level.

Actions:

- Monitor, evaluate and establish the blood lead level based on reference value.
- Review national health objectives for BLLs in children to focus on populations at highest risk for exposure.
- Improve the utility of designated centers for blood lead testing in children at risk populations; and
- Conduct routine targeted screening surveys and/or small-area prevalence studies to identify localities with high lead exposure risk.

Objective 2.2: Facilitate Follow-up Blood Lead Testing and Monitoring of Children Identified as Lead-Exposed

A primary purpose of blood lead testing is to identify children with lead exposure before they show signs and symptoms and ensure that they promptly receive services to identify exposure pathways, reduce exposures, and reduce the potential impacts of lead exposure. State and other health agencies will use blood lead test results above a designated public health action level to initiate lead investigations in the communities once a child is identified as lead exposed.

Epidemiology Division of the Federal Ministry of Health and Community Based Organizations (CBOs) work with healthcare professionals, parents, schools and community groups, states, and local governments as well as development partners to address children's environmental health issues in homes, schools, and communities. FMOH&SW and relevant partners facilitate training of health providers who serve lead-exposed children and their families.

Actions:

- Explore creative ways to work with state, and local communities to match children identified as lead-exposed with local environmental assessment services and enhanced health services; and
- The development partners, government agencies and non-governmental organizations should support the efforts of the Government to increase the number of primary healthcare providers, obstetricians, and pediatricians with continuing education on prevention, diagnosis, management and treatment of lead exposure.

Objective 2.3. Facilitate Screening for Developmental Delays in Children Identified as Lead-Exposed

Once a child is identified as at-risk for developmental delays because of lead exposure by state, tribal and local officials based on their criteria, assessment of the child's developmental progress over time by healthcare providers facilitates early identification of any developmental delays.

Early identification of developmental delays allows providers and communities to intervene earlier to improve outcomes. Because children with elevated BLLs are at high risk for developmental problems, the FMoH&SW recommends continued screening for developmental delays and mental, emotional, and behavioral disorders in those children as they age.

Actions:

- The FMOH & SW works with government and non-government agencies in communities where surveillance has identified children with higher BLLs; and
- Encourage primary healthcare and other service providers to promote developmental monitoring by providing working tools to facilities and basic information to parents and other care givers when a child under five years of age has documented lead exposure.

Objective 2.4. Facilitate Referrals and Receipt of Appropriate Services for Children Identified as At-Risk for Developmental Delays Due to Lead Exposure

Children with developmental delays or at high risk for developmental delays benefit most from interventions that start at an early age. Thus, timely identification and referral to services are critical. Increasing referrals to appropriate services could improve child and family outcomes beyond the cognitive and behavioral sequelae of lead exposure.

Actions:

- Facilitate the development of state action plans and improve access to coordinated systems of care for children exposed to lead in all states.
- The FMoH & SW will facilitate the provision of one-on-one risk assessments and counseling to individuals concerning lead exposures and developmental milestones.
- The FMoH & SW/NPHCDA should provide resources related to lead exposures for families through the Maternal and Child Health Care.

Goal 3: Strategic Communication

Key Priorities: Promote public awareness on the hazards associated with lead exposure by coordinating and streamlining messages on lead exposures in children. Community mobilization and continuous health education. Regular media engagement for prevention and control of Lead poisoning. Maximum pressure campaign on lead poisoning, and community health care.

IMPACT:
Prompt and effective communication with stakeholders will assist the Federal, State, and local governments in their on-the-ground community-based efforts to reduce lead exposures in their communities.

Objective 3.1. Coordinate and Streamline Lead-Related Communication and Messages

To ensure that stakeholders receive consistent and accurate messages on lead poisoning. The Task Force on lead will work collaboratively to expand federal communication efforts by leveraging on and expanding the existing partnerships and stakeholder relationships to develop comprehensive and effective federal-wide communication and outreach plans for reducing exposures to lead poisoning.

Actions:

- Identify communication command for effective communication system (FMoH & SW and NOA).
- Create an online portal to enhance, consolidate and streamline federal-wide communication to the public. Links will direct the public to agency-specific information. (Not everyone affected by lead exposures has access to the internet, and therefore, agencies will continue to provide access to Information, Education and Communication (IEC)/ Social and Behavioral Change (SBC) materials; and
- Enhance local partnerships with community organizations, local health agencies, faith-based organizations, and private philanthropies to raise awareness on the hazard of lead poisoning in products especially lead based paint, and to promote data sharing.

Figure 10: Advocacy

Figure 11: Community Engagement

Objective 3.2. Improve Awareness on Lead Hazards and Prevention Strategies in High-Risk Population

As each community is diverse and deals with a variety of challenges, a one-size-fits-all approach is not effective at increasing prevention awareness. Therefore, it is imperative that outreach activities be designed specifically for diverse populations. Conduct scientific studies on environmental health issues!

Actions:

- Develop appropriate, evidence-based lead exposure prevention and intervention communication materials and disseminate through relevant agencies;
- Enhance partnerships with state and local governments, and key stakeholders (e.g., media, community groups, faith-based groups, advocacy groups, Civil Society Organization, medical providers, philanthropies, Fed Min of Mines and Steel development, Fed Min of Environment, Fed Min of water resources and Fed Min of Agriculture and food securities) that represent or serve communities at risk for childhood lead exposure; and
- Increase outreach events and engagement processes in collaboration with at-risk communities and lead-safe coalitions to provide education on the dangers of lead exposures, strategies for reducing exposures in children, and actions to support exposed children and their families.

Goal 4: Support and Conduct Critical Research to Inform Efforts to Reduce Lead Exposures and Related Health Risks

Address critical information gaps, identify, and eliminate duplication of efforts and maximize leveraging and coordination opportunities. This is because of disparities in BLLs and lead sources vary by location. The relative exposure pathway approaches are needed to evaluate the contributions of multimedia lead exposures and identify risk factors at the local level.

Research efforts through cross-agency collaborations are needed to address key information gaps for identifying children at high risk, and understanding, preventing, and mitigating lead exposure and related health effects.

Key Priorities: Prioritize and address the critical research and data needs to inform lead policies and guide decisions.

Objective 4.1: The research outcome to address the actions identified under this goal is expected to be implemented by FMoH & SW and other relevant stakeholders.

Actions:

- Enhance and apply data and tools (e.g., models or approaches), and determine the key drivers of blood lead levels from multimedia exposures to inform lead regulatory decisions and site assessments.
- Generate data, maps, and mapping tools to identify high exposure communities or locations and disparities for prioritization efforts to reduce blood lead levels in humans especially children.
- Generate data to address critical gaps for reducing uncertainty in lead modeling and mapping for exposure/risk analyses and for estimating population-wide health benefits of actions to reduce lead exposures.
- Identify approaches to prevent, mitigate, and communicate about lead exposures and risks in exposed communities; and
- Evaluate the effectiveness of actions (e.g.,interventions, programs, policies, enforcement) to prevent lead exposure, mitigate health effects and communicate on lead exposures/risks.

Implementing the actions in Objective 4.1 will require effective collaboration among the federal agencies. An inter-agency workgroup is working to further define, prioritize and address the critical research needs. The outcomes are expected to inform lead policies and guide decisions through the application of tools, data, information and approaches and identification of the most effective public health practices to reduce children's lead exposures and its health impact. Prioritizing, leveraging, and coordinating lead research among agencies will identify opportunities to increase the value of individual agency efforts, while remaining cognizant of the different missions, capabilities and resources of the various Federal Agencies.

Objective4.2. Establish the Lead Exposure and Prevention Advisory Committee (LEPAC).

The Water Infrastructure Improvements for the Nation Act requires the Federal Ministry of Health to establish LEPAC as a federal advisory committee. It will review research and federal programs and services. Identify effective services and best practices for addressing, preventing lead exposure and its impacts in affected communities.

Action:

Federal Ministry of Health shall establish:

- The Lead exposure and prevention advisory committee (LEPAC).
- Convene and support the work of the LEPAC. (FMoH&SW, NCDC and relevant partners).

Chapter 5: Management of Lead Poisoning

There is no specific cure for exposed lead patients. The management of lead poisoning is to ensure that BLLs are reduced to a safer level. To manage Lead exposed victims, the patient must be moved from the source of lead exposure before the commencement of medical treatment. Chelation therapy has been shown to reduce mobility and mortality at high levels of blood poisoning. The chelation therapy is the main stay for medical management of lead Poisoning

5.0 Symptoms and Clinical Manifestation of Lead Poisoning

These include developmental delays, abdominal pain, and cramps, neurological manifestation, irritability, low grade fever, vomiting, headache, loss of sights, convulsion, aggressive behavior, constipation, Insomnia, loss of developmental skills, loss of appetite, infertility, high blood pressure, tingling, numbness, anaemia, kidney dysfunction, low IQ, and memory loss.

5.1 Diagnosis of Lead in the home

Definitions.

- **Suspected case**: A person from a community with a high death rate for children, with a combination of two of the following: vomiting, abdominal pain, weakness to the point that the person or child can no longer stand, inconsolable cry, headache, restlessness, numbness, decreased play, in coordination (ataxia), change in skin colour and loss of appetite (anorexia) with an onset of convulsion.

- **Confirmed case definition**: A child of 5 years or less from one of the affected communities with a raised venous blood lead level (VBLL $\geqslant$ 45µg/dL).

Diagnostic Methods

- VBLL testing is the most useful screening and diagnostic test for children with lead exposures.
- Direct detection of lead in capillary blood samples
- Erythrocytes photoporphyrin (EP)
- Haemoglobin screening (HB)
- Complete blood count
- Radiological imaging

5.1.1 **Level of Management of Lead Poisoning**
Case management at different levels of health care

Primary Levels:

- Case detection using the community level case definition; and
- Conduct follow ups on treated cases and patient oral chelation therapy

Secondary Level

- Laboratory testing and case management; and
- Refers complications to tertiary levels or back to health community for oral treatment and follow up.

Tertiary

- Manage cases with complications.

Complications of Lead Poisoning
These include Blindness, deafness, kidney failure, convulsion, unconsciousness that may lead to death, etc.

5.1.2 Disease Management in Health Facilities: Level I, Level II, and Level III

5.1.3Level I: Primary Health Care Centre's, Dispensaries and Health Posts: the Community Health Workers (TBAs, CHIPS, VHCWs etc) Junior Community Health Extension Workers (JCHEW) or trained Patent Medicine Vendors (PMV) belong to this level. There is no laboratory facility at this level.

5.2 Level II: General Hospitals, certain categories of Private Hospitals staffed by Medical Officers, Community Health Officers, or Nurses.

5.2.1 Level III: Specialist, Teaching, and some categories of Private Hospitals.
Three categories of patients may be anticipated at this level. These are patients presenting for the first time, those visiting for follow-up of the same illness and those referred from other levels that have failed to respond to therapy or have severe complications.

5.2.2 Referral

The referral system starts from the caregiver at home who should visit the nearest health facility as soon as there is no perceivable response. In general, health providers and health workers at all levels should be able to recognize their limitations and make early referrals.

Referral should be a two-way process whereby the health worker at the higher health facility should also endeavor to give feedback to the lower-level health facility on the outcome of the patient's management.

Chapter 6: Information, Education and Communication (IEC)/BCC

The aim of IEC is to ensure that individuals, families, communities, and health workers are taking preventive measures to prevent disease, improve on their recognition of dangers of contact with lead:

6.0 Approach

The key components of the IEC/BCC strategy for lead poisoning will include:

- Advocacy:
- Identify the key stakeholders,
- Production of advocacy kits (T-shirts, stickers, banners, hand fliers),
- Develop key messages for the stakeholders.
- sensitization of the stakeholders (through meetings, community engagements and participation)
- Involvement of partners: these will include all tiers of government, non-governmental development agencies, civil societies, private sectors, and individual communities.
- Development of key messages: Messages on hazards of lead poisoning, these messages should be disseminated through the most effective means of communication in relation to the target audience. Options include town announcements, posters,• pamphlets, mass media (electronic/print), special announcements in places of worship etc.

- Monitoring and evaluation of IEC efforts: This is important to evaluate effectiveness. There is a great need to evaluate IEC messages to get feedback from the community on the impact of the IEC.
- Applied research: This will be conducted focusing on areas where gaps in information exist.

6.1 Key strategies

i A baseline survey to determine the knowledge, attitude, beliefs, and practices on lead related activities should be conducted

ii Design and produce appropriate messages to at-risk populations.

iii Train health providers at all health care levels on skills for community mobilization and use of IEC messages

iv Training on the cause, identifications, treatment and prevention of lead poisoning, religious and opinion leaders, and school children

v Production and distribution of IEC materials to target groups nationwide

vi Holding of meetings and community IEC activities using traditional/local channels.

CHAPTER 7: MONITORING AND EVALUATION

Monitoring and evaluation can be done using M&E framework, Logical framework. (Ref National Lead Poisoning Elimination Strategic Plan)

Goal 1: Reduce children's exposure to lead sources.

Objective 1: Reduce children's exposure in homes and child-occupied facilities with lead-based paint hazard.

S/N	Input	Process/Activities	Output	Outcome	Impact
1	• Funds, personnel, training venue, training materials	Training of the mothers, Teachers and HCWs, at the facility levels on identification of lead paint hazards	Number of mothers, HCWs and teachers trained	Increase in the level of awareness among mothers and HCWs	% reduction in children exposure to lead
2	Funds, personnel, Sensitization venue, training materials	Community Sensitization of Women Leaders, Caregivers, Religious Leaders, Youth Leaders, Community Leaders and Traditional Leaders	No of Women Leaders, Caregivers, Religious Leaders, Youth Leaders Community Leaders and Traditional Leaders Sensitized	Increase in awareness of all Stakeholders	% reduction in children exposure to lead

Goal 2: Identify lead exposed children and improve their health outcomes.

Objective 1: Strengthening surveillance of blood lead levels to identify children exposed to lead.

S/N	Input	Process/Activities	Output	Outcome	Impact
1	Lab personnel, DSNOs, lab reagents and other consumables	Training of personnel, sample collection at the community level, handling, and transportation to reference lab	Number of samplescollected, and number of personnel trained	The burden of lead poisoning in the community determined	% of children with improved physical and mental wellbeing

Goal 3: Communicate more effectively with stakeholders.

Objective 1: Coordinate and streamline lead related communication and message.

S/N	Input	Process/Activities	Output	Outcome	Impact
1	stakeholders, key messages, Funds, IEC materials	Identification of stakeholders, develop, production and distribution of key messages	Number of stakeholders meeting held	Public awareness increased	Effective communication among stakeholders achieved

Goal 4: Support and conduct critical research to inform effort to reduce lead exposure and related health risks.

Objective 1: Establish the lead exposure and prevention advisory committee.

S/N	Input	Process/Activities	Output	Outcome	Impact
1	Committee members, TOR document, Fund,	Identification of committee members, development of TOR document, inauguration of the committee	Committee constituted	Number of meetings held by the committee	% of preventive measures and best practices achieved

Chapter 8: Research

Government, other national organizations, and international agencies should support the funding of research. Research focus should include: -

- basic medical sciences research including those geared toward the discovery of new molecules, if possible, or new uses for old drugs or tools; and
- health interventions in conformity to global best health practices

Chapter 9 Legal Issues

9.0 Laws Regulating the Lead Poisoning in Nigeria.

There is no existing law enacted regarding Lead poisoning in Nigeria. However, existing laws that protect lives and environment can be applied: In this regard, the activities of the following should be closely monitored:

a. Food and drug industry
b. Paints and plastic industry
c Paints and plastics containing lead
d. Consumable containing lead
e. Environmental degradation
f. Mining industries

This is in the exclusive legislative list of the Federal Government; the implication of this is that the State Government cannot make laws on mining. However, where mining results in environmental degradation including release of lead, the State Government can make and enforce laws to protect their environments. Where a state does not have existing laws, states can make use of agencies like NESEREA in prosecuting the offenders.

Cases of Environmental degradation can be reported by the Federal Ministry of Health to relevant agencies for enforcement of state laws and prosecution.
These and other related agencies have the power to prosecute in any court of law.

9.1 Police Act

The Police Act empowers police officers to arrest and investigate the case of lead poisoning due to Artisanal mining and send their report to the office of the Attorney General of the Federation in case of Federal offences and to the office of State Attorney General in case of State offences.

Definition of Terms

Unless otherwise expressly provided in this policy, the following words shall have the following meanings:

a. Relevant law Enforcement Agency means: NAFDAC, SON, Office of the Attorney General of the Federation, FCCPC and any other enforcement agent that may be created by National Assembly (Act) and State (law).

APPENDIX 1

GLOSSARY

Artisanal Mining: Artisanal mining is a small-scale informal subsistence mining that is not officially employed by a mining company but works independently mining minerals using low technology and minimal machinery.

Children: Children are young human beings who are typically considered to be in the stage of life between infancy and adulthood, which have relatively low immune system and are prone to diseases and other health related events. They usually range from birth to around 12 years old, although this can vary depending on cultural and legal definitions.

Elimination: Elimination of Lead is a critical step in reducing its harmful effects on human health and the environment.

Lead: Lead is a heavy metal that occurs naturally in the earth's crust. It can be found in soil, rocks, and water and it can also be found in products like paints, gasoline, and batteries.

Lead Poisoning: Lead poisoning is otherwise called plumbism and refers to the deleterious effect of a gradual accumulation of lead in body tissues. Lead is a cumulative toxicant that affects multiple body systems such as Brain, Liver, teeth, Kidney, Bones, and reproductive systems. Exposure to high levels of lead may cause anaemia, weakness, kidney, and brain damage. It is particularly harmful to young children (due to their hand-to-mouth behaviors) resulting in reduced intelligence quotient (IQ), behavioral changes such as reduced attention span and increased anti-social behavior.

Ministry Department and Agencies: This policy employed a one health approach involving the Ministry of Health and Social Welfare, Ministry of Agriculture and Food Security, Ministry of Environment, Ministry of Mines and Steel Development, NAFDAC and NCDC. Other partners that work with the MDAs were WHO, MSF, and Professors from universities.

Policy: Public health policy is the laws, regulations, actions, and decisions implemented within the society to promote wellness and ensure that specific goals are met.

APPENDIX 11

LIST OF CONTRIBUTORS

Frontline Stakeholders (Federal Ministry of Health)

Epidemiology Division

Public Health Department

Food and Drug Administration Department

Legal Service Department

Finance and Account Department

Frontline Stakeholders (State Ministry of Health)

Zamfara State

Niger State

Kaduna State

Plateau State

Ebonyi State

Collaborative Stakeholders (Other MDAS)

Federal Ministry of Mines and Steal Development

Federal Ministry of Environment

Federal Ministry of Water Resources

Federal Ministry of Agriculture and Food Security

Parastatal/Agency

National Agency for Food and Drug Administration and Control (NAFDAC)

Nigeria Center for Disease Prevention and Control (NCDC)

Academia

University of Ibadan, Ibadan, Chemistry Department

Obafemi Awolowo University, Ile-Ife, Chemistry Department

Partners

World Health Organization (WHO)

Medicine Sans Frontiers (MSF)

USAID

UNICEF

Resolve to Save Lives

African Field Epidemiology Network (AFENET)

APPENDIX 111

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