



# Programmatic Framework for Lead

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## INTRODUCTION

Pure Earth is an international environmental health organization dedicated to protecting people and the environment from the harms of toxic pollutants. Pure Earth advances its goals by collaborating with public, private, and civil society organizations to implement sustainable, cost-effective interventions that achieve measurable impacts. Per our **2020-2030 Strategic Plan**, Pure Earth’s current organizational priority is reducing lead and mercury poisoning in low-income and middle-income countries (LMICs), particularly among children and pregnant and lactating women.

Indeed, Pure Earth and its partners are responsible for a considerable amount of scientific literature, data, advocacy, and intervention case studies around lead exposures in LMICs. Pure Earth has conducted on-site assessments at more than 1,600 lead-contaminated sites and has conducted exposure-reduction programs in more than 50 communities. In 2017, Pure Earth led the drafting of [The Lancet Commission on pollution and health](#),<sup>1</sup> and in July 2020, Pure Earth and UNICEF published “[The Toxic Truth](#),”<sup>2</sup> a report focused on sources of lead exposure, impacts on children’s health, and mitigation strategies. Currently, Pure Earth has several multi-year grants supporting lead exposure reduction programs from Clarios Foundation, GiveWell, Takeda Pharmaceutical Company Limited (“Takeda”), and others.

The purpose of this document is to establish and describe *Pure Earth’s Programmatic Framework for Lead* (“*The Framework*”). Through this structure, we explain our lead strategy, and create a resource to help staff design and implement lead projects that are consistent with this strategy.

*The Framework* is presented through a set of elements including:

- Problem Tree
- Theory of Change
- Program Intervention Logic
  - Outcomes and Performance Indicators to monitor progress
  - Activities
- Snapshot of Pure Earth’s Implementation Approach

While individual lead projects will not include all aspects of *The Framework*, every project should be able to place itself somewhere within our problem tree, intervention logic, and theory of change, and contribute to some sub-set of *The Framework’s* programmatic outcomes.

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<sup>1</sup> Landrigan, Prof Philip J, MD; Fuller, Richard, BE; Acosta, Nereus J R, PhD; Edeyi, Olusoji, DrPH; Arnold, Robert, PhD; Basu, Prof Niladri (Nil), PhD; et al. The *Lancet* Commission on pollution and health. The Lancet Commissions. Volume 391, Issue 10119, pps 492-512. February 3, 2018.

[https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(17\)32345-0.pdf](https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(17)32345-0.pdf)

<sup>2</sup> Rees, Nicholas and Fuller, Richard. The Toxic Truth: Children’s Exposure to Lead Pollution Undermines a Generation of Future Potential. UNICEF and Pure Earth. 2020.

<https://www.unicef.org/media/109361/file/The%20toxic%20truth.pdf>

## GLOSSARY

**Activity:** The actions you intend to conduct (trainings, workshops, BLL screenings, campaigns, etc.) in order to reach your objectives and contribute to outcomes and larger goals.

**BLL:** blood lead level. The concentration of lead in blood. Usually expressed as micrograms per deciliter or µg/dL.

**Disability-adjusted life years (DALYs):** an indicator of morbi-mortality (see below), years of life lost due to premature death and years of life lost to disability. 1 DALY = the loss of the equivalent of 1 year of full health.

**Externality:** a side effect or consequence – positive or negative - of an activity (often industrial or commercial) that affects other parties without this being reflected in the cost of the goods or services involved. (Positive example: the pollination of surrounding crops by bees kept for honey. Negative example: noise and pollution caused by manufacturing.)

**Evaluation:** the periodic, retrospective assessment of a process, project, or program. The purpose may be to inform summative decisions such as whether or not to continue similar projects, or formative decisions, such as how to improve project design and early implementation. Evaluation objectives may be to assess: whether, and to what extent, a project has achieved its expected results; causal contributions of activities to results; or a project or program's long-term impacts – both expected and unexpected.

**Goal:** the higher-order aspiration to which a project or program is intended to contribute. A goal should be lofty in nature and not resource dependent. Many projects can contribute to the same goal.

**Indicator:** a particular characteristic or dimension used to measure intended changes. An indicator is a quantifiable sign or marker that measures one aspect of a project to determine whether a project is on track towards reaching its targets on time. To be useful, indicators should be specific, measurable, achievable, relevant, and timebound (SMART).

**Intergenerational Transmission of Poverty:** the cycle through which the children of people living in poverty are more likely than children of the well-off to live in poverty as adults themselves. Factors

### A note on terminology

Individual organizations and funders (and people) can use different words to refer to the same concepts. For example:

- Goals/Impacts
- Outcomes/Results
- Outcomes/Outputs
- Deliverables/Outputs

As some users may be accustomed to different vocabulary, the terms of interest, as we use them in *The Framework*, are defined in this Glossary section. The terminology aligns with most USG funders.

While it's more important that concepts are clearly and commonly understood than that we all use identical terminology, the latter can make the former simpler.

that contribute to intergenerational poverty are many, intertwined, and much studied, but still not very well understood. Known factors include disparate access to educational and social opportunities, bias and discrimination (e.g., race, gender), and differences in health outcomes, including those caused by exposure to pollution. Bowles and Herbert suggest that “taking into account the fact that the children of the well-to-do are much healthier than poor children along with the fact that poor health has substantial effects on incomes later in life would probably account for a substantial part of the intergenerational transmission (of wealth) process.”<sup>3</sup>

**KAP survey:** a method to investigate what is known (Knowledge), believed (Attitude), and done (Practiced) in the context of the topic of interest, usually health-related. KAP surveys may reveal misconceptions or misunderstanding that can present obstacles to activities we would like to implement and potential barriers to behavior change. (Note: KAP surveys record an opinion and are based on statements; there may be gaps between what is *said* and what is actually done.)

**Lead poisoning:** For Pure Earth, lead poisoning is a BLL exceeding 5 micrograms per deciliter (µg/dL). This is the reference value that the World Health Organization (WHO) considers the threshold value to trigger action.<sup>4</sup>

**Learning:** the process through which we apply the knowledge that emerges from projects in order to make evidence-based decisions, to continually improve our work and to achieve results. This could apply to project design and in-process implementation (adaptive management), management processes, strategies, etc.

**Logic Model:** a method of presenting an idea. Logic models describe a bounded project or initiative: what is planned and what results are expected. The development of models provides an opportunity to review the connections between activities and outcomes. Logic Models can be used in design, planning, implementation, and evaluation. Benefits include:

- Developing common language with stakeholders
- Offering participatory learning opportunities (assuming they are developed participatorily)
- Documenting explicit outcomes
- Clarifying knowledge about what works and why
- Identifying important variables to measure
- Providing a reporting framework
- Improved design, planning, and management<sup>5</sup>

Two general types of Logic Model are the Program Logic Model and the Theory of Change.

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<sup>3</sup> Bowles, Samuel and Gintis, Herbert. “The Inheritance of Inequality.” Journal of Economic Perspectives. Vol. 16, No.3, Summer 2002, pp.3-30. <https://www.aeaweb.org/articles?id=10.1257/089533002760278686>

<sup>4</sup> WHO Guideline for Clinical Management of Exposure to Lead. 2021. <https://www.who.int/news/item/27-10-2021-who-guidance-to-reduce-illness-due-to-lead-exposure#:~:text=The%20WHO%20Guideline%20for%20Clinical.reduce%20or%20end%20this%20exposure.>

<sup>5</sup> Introducing Logic Models. [https://www.sagepub.com/sites/default/files/upm-binaries/50363\\_ch\\_1.pdf](https://www.sagepub.com/sites/default/files/upm-binaries/50363_ch_1.pdf)

**Monitoring:** the ongoing, routine collection and analysis of data on activity, project, or program parameters to provide project managers with indications about implementation quality, and of the extent of progress against plans and targets, including performance indicator targets.

**Morbi-Mortality:**

- Morbidity refers to illness or loss of function in your body or mind, including age-related and chronic diseases. A person with a morbidity may not live as long as a healthy person, but it doesn't necessarily mean they are in imminent danger of death.
- Mortality means the number of deaths caused by an event or illness of a specific period of time.

**Objective:** a statement of the condition or state one expects to achieve. Objectives should be concrete, time-bound, and measurable.

**Outcome/Outcome Indicator:** the *changes or conditions* that indicate progress toward achievement of project/program goals. (e.g., project participants apply new skills, laws are passed, decrease in average BLLs) Outcomes are results higher than an output to which a given project output contributes. The results or effect that is caused by or attributable to a specific activity.

**Output/Output Indicator:** the tangible, immediate, and intended *products or consequences* which result from inputs/activities (e.g., # workshops, papers published, people trained, pamphlets produced, social media posts) and are within the project's control, and the indicators that capture those products or consequences.

**Reporting:** refers not just to report documents, but to all means (methods, processes, tools, media) by which individuals and organizations communicate about progress during the implementation of a project or program. Reporting can be upward or downward, internal or external, and is an instrument for accountability, project management, learning, fundraising, etc.

**Prevalence:** the proportion of a population who have a specific characteristic in a given time period, regardless of when they first developed the characteristic (in our case, lead poisoning showing a BLL above 5 micrograms per deciliter).

**Program:** a set of related projects that have a common goal, long-term outcomes and/or produces common benefits. For example, the Takeda and Clarios projects are part of Pure Earth's lead program.

**Program Logic Model:** an operational type of logic model that shows a project's or program's resources, activities, and their outputs and outcomes. This document, *The Framework*, is a Programmatic Logic Model which includes a Theory of Change. Tools used to illustrate programmatic logic models include *logframes* and *results frameworks*.

**Project:** a set of tasks that must be completed, within a set amount of time and with a certain amount of funding, in order to arrive at a particular goal or outcome(s) and/or produce particular outputs.

Depending on the size and scope of the project, these tasks may be simple or elaborate, but all projects can be broken down into objectives and what needs to be done to achieve them.

**Rapid Market Screening (RMS):** an activity that aims to identify sources of lead that may contribute to chronic exposure by analyzing lead concentrations in samples of consumer products and foods sources from local markets.

**Target:** an expected value or level for an indicator, at a specified future point in time. The target shows the level of achievement expected in order for results to occur. Targets are compared against actual results.

**Technical Assistance:** the process of providing targeted support to an organization or entity that has a development need or problem. It is an effective method for building the capacities of an organization or entity. Largely, technical assistance is a capacity-building activity.

**Theory of Change:** a conceptual type of logic model that shows how we believe change happens. It is more general and not as detailed as a programmatic logic model such as a results framework or a logframe. A theory of change should:

- Provide a compass, not a map
- Aim for a best guess, not best practice
- Ask the right questions, not prescribe the answers
- Be based on local knowledge, not imported models (unless adapted)
- Be iterative – stand back and test every X# months, then revise
- Incorporate antennae to read changing external circumstances, learn from success/failure<sup>6</sup>

**Toxic Sites Identification Program (TSIP):** global database that contains information on the distribution, prevalence, and severity of chemical contamination hotspots. Currently holds information on 5,000+ assessed sites across more than 50 countries. Today, the TSIP is one of Pure Earth's most visible programs and remains a unique resource used by governments, development agencies, non-profits, researchers and community groups.

## THE PROBLEM/CHALLENGE

### What is the problem/challenge?<sup>7</sup>

- Globally, more than 800 million children are estimated to be poisoned by lead, presenting a concentration of lead in their blood above 5 µg/dL.

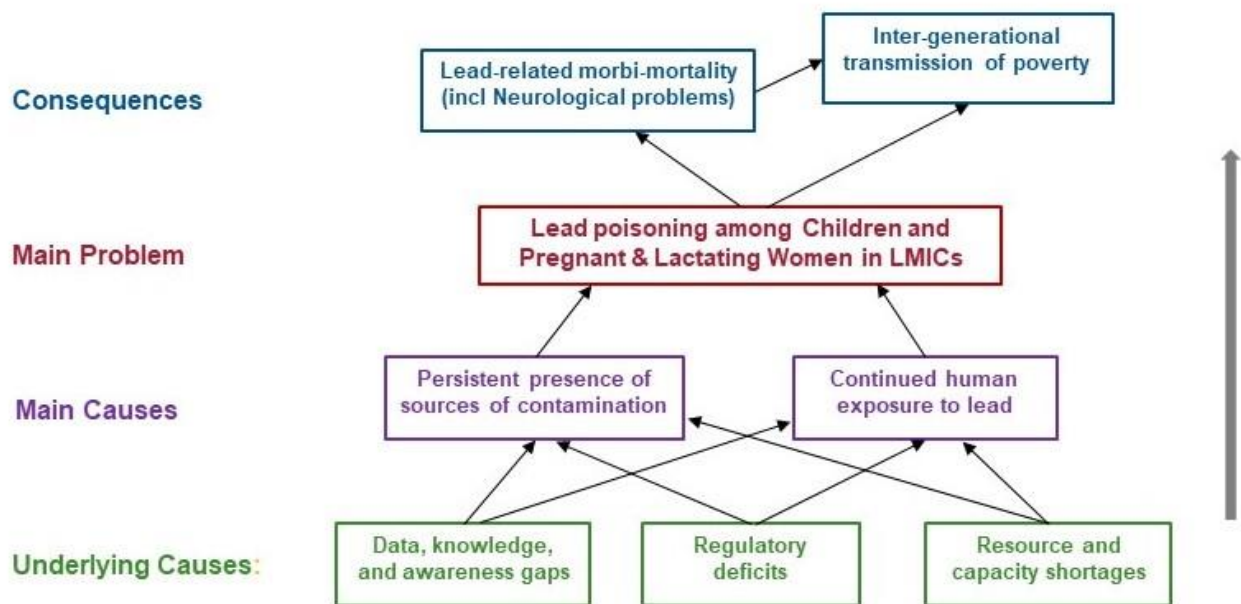
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<sup>6</sup> <https://frompoverty.oxfam.org.uk/theories-of-change-the-muddy-middle-and-what-to-do-about-assumptions/>

<sup>7</sup> Unless otherwise noted, the statistics in this section come from *The Toxic Truth* report.

- More than 90% of severely lead-poisoned children live in LMICs, and within those countries, the majority belong to the most vulnerable and socio-economically deprived populations. The WHO states, “Poor people are more likely to be exposed to lead and to be at risk of exposure to multiple sources... Communities that lack political influence, communities that are disenfranchised, and ethnic minority groups have repeatedly been shown to be at greater risk of exposure to lead than other populations.”
- An indeterminate number of adults have been or are severely exposed to lead, which contributes in the long-term to the development of heart and kidney diseases, among other health problems, and results in an estimated one million annual deaths.<sup>8</sup>

Figure 1. Simplified Lead Problem Tree



<sup>8</sup>WHO. <https://www.who.int/news/item/23-10-2022-almost-1-million-people-die-every-year-due-to-lead-poisoning--with-more-children-suffering-long-term-health-effects#:~:text=Each%20year%2C%20an%20estimated%201,toxicity%20to%20the%20reproductive%20organs>.



## What are the consequences of lead poisoning?

### *Among children:*

- For most children with a BLL above 5 µg/dL, lead poisoning is asymptomatic, however, the WHO has determined that such levels can cause permanent and irreversible brain and neurological damage. This damage manifests in the loss of 3-5 IQ points, and damage to the brain's frontal cortex, reducing a person's capacity for empathy and self-control, increasing their tendency to anti-social behavior.
- With increasing lead levels above 30 µg/dL, clinical symptoms such as anemia and abdominal colic can occur.
- Children with BLLs above 45 µg/dL require clinical treatment, including chelation therapy. At higher levels, depending on the symptoms (e.g., seizures, encephalopathy), hospitalization and enforced treatment is necessary. A BLL above 100 µg/dL can be fatal.
- Given the LMIC origin and socio-economic background of the vast majority of lead-poisoned children, and the secondary conditions and diseases they can develop, it's likely that lead poisoning contributes to the inter-generational transmission of poverty due to those health and cognitive problems.

### *Among general population:*

- 900,000+ annual deaths in 2019 were caused by heart disease cases attributable to long-term lead exposure—a mortality toll approximately equal to HIV/AIDS and greater than that of malaria.
- The IMHE estimated in 2019 that lead exposure accounted for 62.5% of the global burden of idiopathic developmental intellectual disability,<sup>9</sup> 8.2% of the global burden of hypertensive heart disease, 7.2% of the global burden of the ischemic heart disease, and 5.65% of the global burden of stroke.
- Pregnant and lactating women present levels of lead concentration that can represent a health problem for them as well as for their fetuses and babies. These include an increased rate of spontaneous abortion and preterm birth, reduced birth weight and impaired cognitive development, depending on the dose, and especially during the specific critical windows during the pregnancy.
- The loss of intellectual capital among poisoned children can reduce their lifetime earnings and productivity, with an estimated cost to GDP of 4% in Africa and 2% in Asia and Latin America. This said, it's also important to note that these losses disproportionately affect the lowest socio-economic groups in society, those for whom increased consumption, usually related to increased earnings, is more critical to improved wellbeing than to those in higher socio-economic groups.

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<sup>9</sup> Ideopathic definition: related to or denoting any disease or condition which arises spontaneously or for which the cause is unknown. ([Oxford Languages](#))

## What are the *main causes* lead poisoning?

Lead exposure's contribution to a high prevalence of elevated BLLs and lead poisoning is often multifactorial, with multiple sources simultaneously affecting the same geographic area or household. Sources of contamination and contamination pathways can vary depending on pollutants, contexts, or age groups, and different sources can accumulate or interact, giving rise to high BLLs in children and adults. Pure Earth focuses primarily on those lead sources that most contribute to lead exposure among children and pregnant and lactating women.

We work with two variables: contamination sources, and human exposure to those sources. Hence, the **two main causes** of lead exposure for us are:

1. **Persistent presence of lead sources in LMICs:**
  - Lead contamination of soils and dust: in and around active or abandoned (“legacy”) industrial sites, including small-scale activities such as informal ULAB recycling.
  - Lead in kitchen stuff, including adulterated or contaminated food (spices, chocolate, candies, baby-food, grains, vegetables) and the presence of lead in foodware (ceramic, metallic or plastic items used to cook, serve or store food).
  - Use of lead in consumer items: toys, traditional medicines, cosmetics, pigments, etc.
  - Residential surfaces and fixtures: paint (and its dust) and pipes.
  - Air pollution near manufacturing areas or caused by leaded fuels used by small planes.
2. **Continued human exposure to lead contaminated sources:**
  - People living, working, learning, and playing in areas with high levels of pollution in soil, dust, air, or water.
  - Occupational exposures: lack of protection, safety equipment, and/or training among industrial workers and operators of lead-products.
  - Families living in houses with lead-paint or lead-pipes (known or unknown).
  - Regular use or consumption of items containing lead (pottery, foods, toys, cookware, etc.). Important to note that many of these products may be used or consumed very far from where they have been produced or contaminated.
  - Populations ingesting or inhaling lead particles in air pollution from leaded fuels in small planes and industrial chimneys/smokestacks.

## What are the *underlying causes* of lead poisoning?

Whereas in high income countries, lead exposure among children has declined dramatically in recent decades, children in LMICs continue to experience elevated BLLs. The *underlying* causes include:

1. ***Insufficient data about lead poisoning and/or lack of knowledge about lead poisoning due to lack of data or lack of education/awareness about existing data***

- Lack of *data* about the existence or magnitude of the problem and its public health implications among authorities, the private sector (e.g., industry), and affected communities is recurrent in LMICs.
- Lack of *knowledge* about lead poisoning, either because of the lack of data or the lack of education about existing data. In other words, data may exist, but it's not been adequately communicated or disseminated. This lack of knowledge contributes to inaction of authorities and industry, and/or risky behavior among these communities.
- To design effective lead poisoning prevention and mitigation measures, stakeholders must understand the prevalence, severity, and demographic distribution of lead exposure through national or subnational surveys, and identify the primary exposure sources and pathways. Only then can implementers ensure interventions target the most at-risk populations and key exposure sources. Unfortunately, these preliminary steps have not been undertaken yet in most LMICs.

## 2. ***Lack of adequate regulations or their enforcement to mitigate or clean up pollution***

- Partially due to the lack of knowledge mentioned above, but also to lack of interest from some governmental authorities, regulations in LMICs pertaining to lead use and contamination (e.g., industry emissions, occupational health and safety regulations) are sometimes poor and/or inadequately enforced. Industry and other private sector actors and affected communities may lack incentives to follow laws and regulations due to corruption, collusion, or weak enforcement.
- Corruption and deliberate strategies to attract investment can be behind inadequate regulation and enforcement. Governments and industry or other private sector actors may prefer low levels of environmental and social regulation to facilitate higher profits.

## 3. ***Lack of resources and/or capacity***

- A lack of knowledge and/or interest often translates to a lack of resources and investment. However, in some cases, resource shortages for the elimination of contamination sources and exposure are structural and related with poverty, an important limiting factor even among motivated actors. Resource shortages refer not only to financial resources, but may also include insufficient human resources to carry out the necessary tasks, absence of technical expertise, or inadequate equipment and health surveillance systems.
- Progress may be limited by chronic under-investment in areas populated by marginalized groups such as indigenous peoples, racial, ethnic, or religious minorities, opposition groups, women, and people living in extreme poverty. In resource-constrained environments, investment decisions are sometimes based on political, ethnic, or socio-economic considerations, not on cost-effectiveness or on justice/equity.
- Finally, market failures in accounting for environmental externalities may also limit the resources available to mitigate lead poisoning in LMICs. Since environmental and health harms are not priced into products and paid by consumers, those externalities are often born by governments and communities that are already dealing with a variety of priority issues and may not be able to allocate resources to lead poisoning mitigation. Thus, the benefits are privatized, and the costs are socialized.

## THEORY OF CHANGE

A theory of change is a type of logic model that shows *how we believe change happens*. As the name implies, a theory of change is conceptual. Theories of change are distinct from a programmatic logic models, which are operational rather than conceptual and include details and specifics like resources, activities, outputs, and outcomes.

Programmatic logic models, like the **Intervention Logic** described below, can be simplified and illustrated using tools like *logframes* and *results frameworks*. This is especially useful when designing projects and creating funding proposals. As one learns and tests assumptions through project implementation, research, assessments, etc., theories of change should be revisited and updated to reflect new learning and understanding.

**Pure Earth's Theory of Change around lead**, illustrated in **Figure 2**, below, can be expressed as:

**IF** elevated BLL prevalence within a specific area is revealed through BLL testing,

**AND** the primary sources and pathways of lead exposure are subsequently identified and analyzed (scope, severity),<sup>10</sup>

**AND IF** incentives and justifications (e.g., market incentives; threats of fines or shut down; cost-benefit analyses) for taking action are identified,

**AND IF** these results and findings are shared with government, private sector actors, local organizations, the media, and affected communities,

**THEN** these stakeholders will have the data, information, and stimuli they need to take action to prevent lead poisoning.

*For example:*

- **Government:** *allocate resources (as permitted by budget), create and enforce policies and regulations, implement programs, systematize BLL surveillance.*
- **Private sector/industry:** *institute and/or comply with standards and regulations, improve environmental performance, remediate contaminated sites.*
- **Local NGOs:** *advocate for government action, carry out campaigns, raise public awareness, design/implement risk-reduction activities.*
- **Media:** *raise public awareness.*
- **Communities and households:** *raise awareness, advocate for government action, and take steps to protect themselves from exposure.*

**IF** resulting actions produce measurable, sustained reductions in lead concentrations in products, environmental media, and/or BLLs,

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<sup>10</sup> Primary sources identified through home-based assessments of a subset of BLL households and/or via market-based assessments of consumables and products

**THEN** relevant stakeholders will have evidence and intervention models of what works to replicate, and/or scale up.

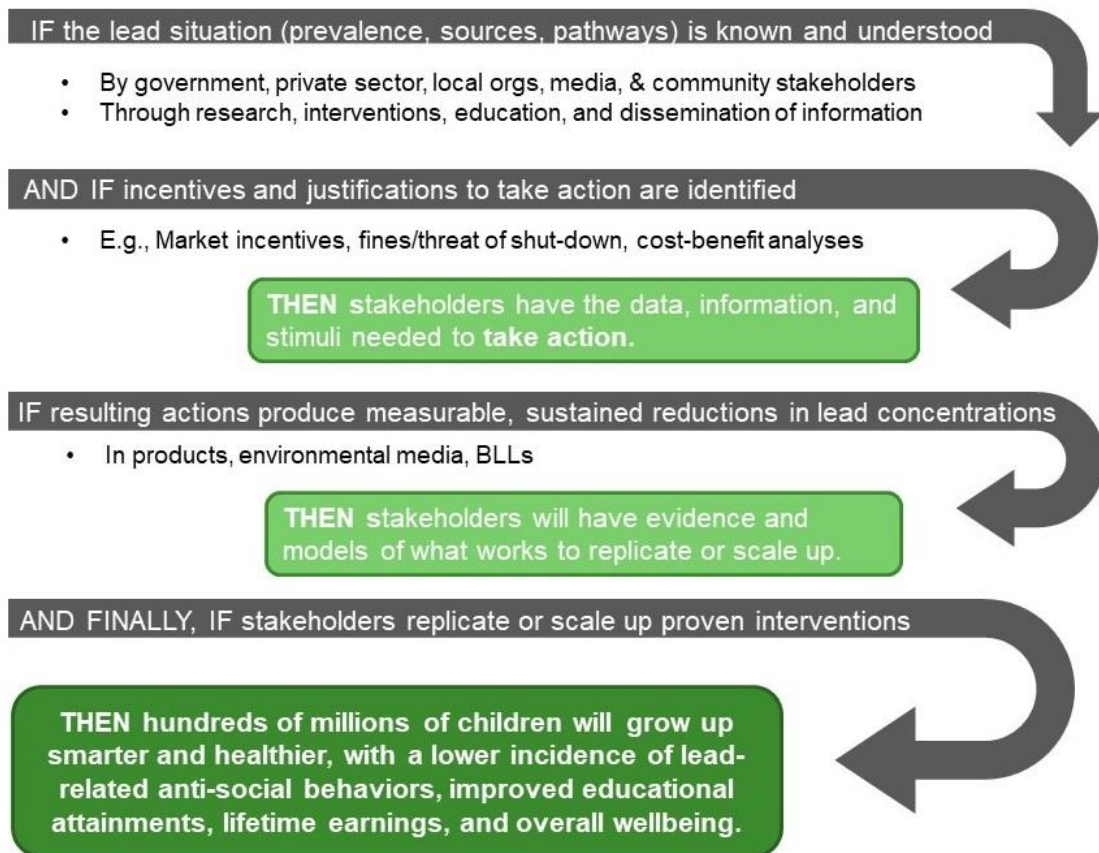
**And Finally,**

**IF** countries and other actors replicate and scale-up proven lead interventions, **THEN** hundreds of millions of children in current and future generations will grow up smarter and healthier, with a lower incidence of lead-related anti-social behaviors, and with improved health outcomes, educational attainment, lifetime earnings, and overall wellbeing.

**Assumptions:**

- BLL tests are correctly administered and results are accurate, broadly disseminated and understood.
- Presented with information, data, incentives, etc., governments and other stakeholders are motivated to act.
- Incentives and pressures will motivate industry stakeholders to improve their environmental performance and reduce public health risks associated with their activities/products.
- Government budgets allow for resources allocation to this issue.
- Programs or projects are well designed and implemented.
- Communities want to participate.

**Figure 2: Lead Theory of Change**



# LEAD PROGRAM INTERVENTION LOGIC

## General Statement

Pure Earth’s programmatic activities aim to prevent and reduce lead poisoning in LMICs by removing contamination sources and/or by reducing human exposure to them. We achieve this through pragmatic interventions that generate data and knowledge, improve regulatory frameworks, remediate lead hazards, improve the environmental performance of industry, facilitate the adoption of lead substitutes in production processes (e.g., pottery glaze), and increase resources to address lead pollution.

Pure Earth applies a practical, solution-driven approach.<sup>11</sup> We combine advocacy, social and behavioral change strategies, and technical assistance with effective implementation. Our approach is interdisciplinary, bringing together environmental science and engineering, public health, social and medical sciences, and other methodologies to fulfill our objectives.

## Impact Goals

Impact Goals refer to changes a program (or project) aims to achieve in the long-term, beyond the life of a program. Impact Goals usually address the direct consequences of the problem a program is designed to solve and are stated as substantive changes that are expected to take place during the lives of the target population.

Programs should *contribute* to the achievement of Impact Goals; however, actual achievement of those goals may depend on factors outside of the program. Normally, Impact Goals are *not* measured within the program cycle due to the long period of time required to observe such impacts, and the inability to attribute changes observed solely to program interventions.

Pure Earth’s Long-term Impact Goal for lead

- Reduction of morbid and mortality among children and, in the long-term, the general population, related to lead poisoning.

## Programmatic Outcomes

Programmatic Outcomes are the changes that result from programmatic activities, within the life of a program or project, and which help us reach our Long-term Impact Goals. Within this intervention logic, High-level Outcomes correspond with the Main Problem. Intermediate Outcomes correspond with the Main Causes. Sub-intermediate Outcomes correspond with the Underlying Causes.

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<sup>11</sup> Pure Earth’s approach is one of many applied by humanitarian and international development organizations. Other approaches include a feminist approach, human rights-based approaches, and principles-based approaches.

## High-level Outcomes

*High-level Outcomes (and Impact Goals) are linked with the Main Problem:* lead poisoning among children and pregnant and lactating women in LMICs.

High-level Outcome: Reduction of prevalence of lead poisoning among children and pregnant and lactating women, or other targeted populations, in intervention areas.

### High-level Outcome Indicators

- Percent of children and pregnant & lactating women with elevated BLLs (prevalence)
- Average BLL among children and pregnant & lactating women in intervention area (severity)

## Intermediate Outcomes

*Intermediate Outcomes correspond primarily to the Main Causes of lead poisoning:* 1) the persistent presence of lead sources; and 2) continued human exposure to these sources. In other words, they relate to the removal of contamination sources, the reduction of lead concentration in sources, or the reduction of human exposure to those sources (when their complete removal is not possible).

Intermediate Outcome 1: Elimination or reduction of lead hazards (includes contaminated site remediation & reducing presence / concentration of lead in products)

### Illustrative Indicators

- Number of hectares of contaminated soil remediated to < standard or reference value
- Percent of soil samples that exceed standard or reference value
- Average lead concentration in a specific source (e.g., soil, dust, paint, pottery, metal cookware, spices, cosmetics, toys)
- Percent of product samples (of a specific type) that exceed standard or reference value
- Percent of product (of a specific type) testing positive for lead
- Percent of markets selling products (of a given types) that test positive (or exceed standard/reference value)

Intermediate Outcome 2: Reduction of human exposure to contaminated sources

### Illustrative Indicators

- Number of people exposed to a contaminated site
- Number of people living in homes with lead paint
- Percent of households that own/use contaminated items (e.g., dust, paint, products)
- Percent of applicable workplaces that have / follow health & safety guidelines
- Percent of employees at applicable workplaces that have received health & safety training

## Sub-Intermediate Outcomes

*Sub-intermediate Outcomes relate mainly to the Underlying Causes of lead poisoning:* the lack of research and data, the lack of knowledge and awareness, the lack of regulations or their enforcement, and the lack of resources.

## Sub-Intermediate Outcome 1: Increased research, data, knowledge, and awareness

### Illustrative Indicators

- Number of signals of support from key actors towards generating data, learning about existing data, or disseminating data with others (e.g., formation of working groups, international commitments)
- Percent of target audience demonstrating knowledge about lead exposure (e.g., kids, industry)
- Number/percent people trained with demonstrating new or increased skills or knowledge
- Percent social media audience growth
- Percentage of target population that change their behavior (e.g., handwashing, use of PPE)

## Sub-Intermediate Outcome 2: Strengthened regulatory systems

### Illustrative Indicators

- Laws, policies, regulations, standards developed, modified, or adopted that address lead pollution (e.g., ESM of LAB/ULAB, “economic tools”)
- Number of actions taken in response to recommendations
- Percent of industry in compliance with regulations / degree of compliance
- Number of firms that improve technologies or practices to reduce toxic emissions

## Sub-Intermediate Outcome 3: Increased resources and capacity to address lead pollution

### Illustrative Indicators

- Number of signals of support from key actors towards taking on interventions begun through Pure Earth project (e.g., cleanups, such as in Vietnam)
- Amount of new funding allocated or leveraged by partners for lead programs
- Number/percent people trained that *apply* new or increased skills or knowledge
- Number of key orgs/groups that adopt improved tools, technologies, or practices
- New (or improved) projects, programs, systems implemented by partners (e.g., BLL surveillance by gov't)
- Replication or scaling of interventions
- Government funds lead-dedicated staff/experts (Secondments hosted by stakeholders)

## Activities

Activities are the specific actions and tasks we complete within a project in order to materialize outputs and outcomes and achieve project objectives. Activities and their respective targets are essential to project management because they help us to know what organizational inputs are needed and when, which allows us to work within budgets, timelines, with org charts.

However, tracking achievements through activity targets is not the right way of measuring programmatic success. In fact, just reaching activity targets does not necessarily mean a project is effective. **It is the attainment of outcomes (measured through progress towards indicator targets) and objectives which marks success.** In other words, we can be below activity targets and still be successful overall if the outcomes are achieved through a more efficient execution of the activities. The reverse is not true.



*Activities are typically connected with the Main or Underlying Causes of our Main Problem. They try to address the issues identified at the bottom of our Problem Tree. For that reason, most of our activities will be related to knowledge generation (to tackle knowledge gaps), with regulatory improvements (to solve regulatory deficits), and with technical assistance to the concerned actors to increase capacity through Pure Earth's monetary or in-kind contributions to address resource scarcity.*

## **Activities related with Main Causes**

Hazards and exposure to them (not exhaustive)

- Toxic site clean-up, mitigation, and remediation activities in resource-constrained settings.
- Lead sources removal in resource-constrained settings (pottery exchanges, replacement of contaminated items from homes -mattresses, cookware, foods, lead-paint elimination, etc.).

## **Activities related with Underlying Causes**

Data and knowledge generation and awareness raising (not exhaustive)

- Baseline BLL surveys
- Setup of monitoring and surveillance systems
- Source apportionment studies
- Source identification and assessment (RMS, home-base assessments, TSIP, etc.)
- Supply chain analysis
- KAP surveys
- Community education and public awareness actions among high-risk population
- Communication campaigns and information sharing
- Publication of research results and articles
- Operational research and piloting for innovative methodologies and products.

Activities related with the improvement of regulatory frameworks (not exhaustive)

- Legal and regulatory assessments and recommendations
- Advocacy
- Policy and Regulatory technical proposals
- Piloting, follow-up, and dissemination of regulatory measures

Activities related with resource/capacity increase (not exhaustive):

- Training and skills and knowledge transfer for workers, industry, academia, governmental bodies, health professionals, etc.
- Lead-Expert Secondments in governmental bodies
- Technical assistance and intervention design
- Collaborative fundraising activities
- Building data management systems

## Activity Indicators

Activity indicators are not typically part of a project's results framework or logframe as we track activity execution through work plans and through inputs follow-up (budget, staff time, spent resources, etc.). However, while reaching activity targets does not necessarily mean we are closer to our intended outcomes, it is a way to help internally evaluate how we plan and implement.

The type of activity indicators, which can help ensure “ground-truthed” implementation design and planning, may include:

- Number of activities vs planned targets (meetings, workshops, assessments, trainings, clean-ups)
- Number of people impacted / participants, disaggregated by sex, if applicable
- Number of publications
- Number of people in audience, disaggregated by sex, if applicable
- Number of allied institutions & partners
- Number of sites assessed / remediated sites

You will notice that Activity Indicators are frequently focused on counting things. This type of indicator, which is used to describe the delivery of products or count the type of and types of things, services, or people is also known as an *Output Indicator*.

## TRANSITION CRITERIA

While the nature of systems-level work is continuous and unfolds over time, Pure Earth's interventions are temporary and needs-based. They are intended to help to reduce BLLs in our intervention areas while supporting governments and other duty bearers to establish durable institutional mechanisms that are able to sustainably address lead poisoning at local and national levels. Once such mechanisms are in place, progressing well (or halted), Pure Earth will shift its resources to other intervention areas.

Transition criteria may include:

1. Prevalence of lead poisoning among children and pregnant and lactating women, or other target population, in our intervention areas below a specific level, TBD by intervention context.
2. Declining trend in lead poisoning prevalence in our intervention areas.
3. In absence of BLL evidence, declining trends in lead concentration in soils, products, or other project-relevant exposure sources.
4. Functional monitoring and surveillance system established in the country of intervention or its main hotspots.
5. Decision-making tools and system around data collected through monitoring and surveillance system developed and in use.

## INTERVENTION AREAS

Pure Earth country offices will follow the **2020-2030 Strategic Plan** as it relates to operational continuity as well as country expansion or phase-out decisions. For the selection of intervention areas within strategic countries, Pure Earth will prioritize lead poisoning hotspots, focusing on national, subnational, and/or local areas with confirmed (or suspected, where BLLs are not available) high-prevalence of lead poisoning among children and pregnant and lactating women. Where BLL measurements are not available, we use proxy indicators mainly based on source identification and/or assessments data, as well as IHME BLL estimates. A high density of contamination sources may be used as a proxy indicator for high BLL prevalence when IHME estimates also indicate a high BLL prevalence for the specific country or region.

Regarding the type and scope of our activities in LMICs, we mainly prioritize national entities for regulatory activities except in very decentralized countries where sub-national administrative divisions have significant decision-making power. For knowledge generation activities, we tend to focus on sub-national entities where lead exposure is known to be high and we think our work will have more impact on at-risk communities and on removal of pollution sources, not necessarily through Pure Earth's direct implementation. Because of resource shortages in LMICs, when carrying out clean-ups or remediations, Pure Earth focuses at the local level. This is due to our low capacity (as a small NGO), and to the way in which exposure occurs at toxic sites, i.e., only a small number of people living or working right around the site are affected.

Pure Earth may also engage in trans-boundary activities when global supply chains are an important part of the problem and contaminated products are produced in one place and consumed in another.

## TARGET POPULATION

Pure Earth's main beneficiaries are children and pregnant and lactating women. The focus on these groups is not based on our activity types or the stakeholders we work with, but on the expected impact of our projects. Indeed, we work with public and private sector / industry actors, communities, and governments alike, but we think that the positive outcomes of reducing lead exposure are most significant for children and childbearing women.

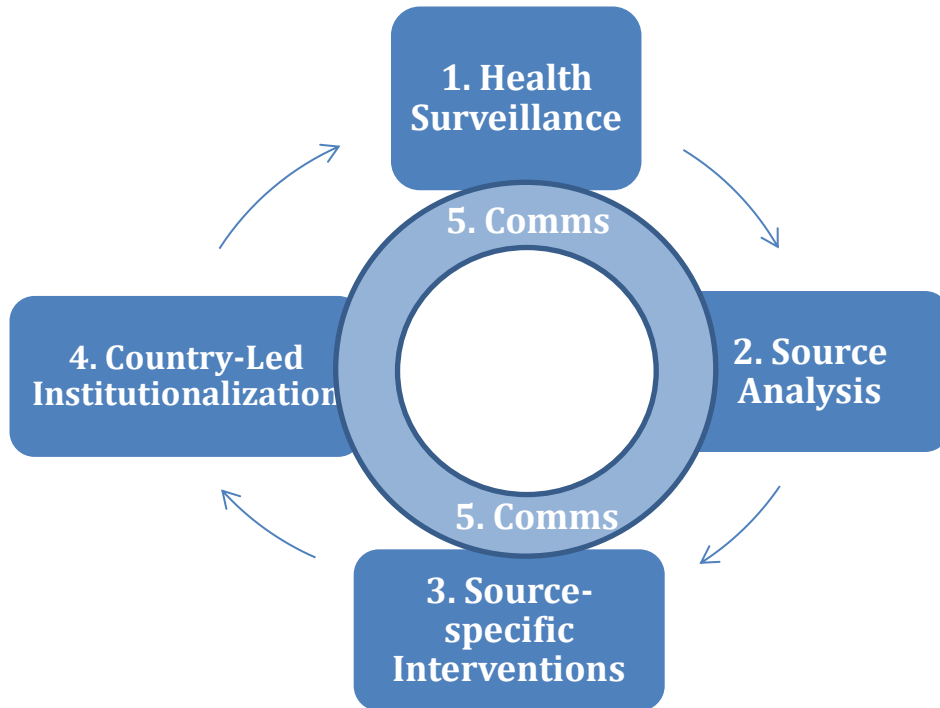
Given the social distribution of lead poisoning around the world, the groups that stand to most benefit are people living in poverty. Often, marginalized groups experience discrimination in the application of laws and policy, and in access to resources, services, and social protection. This is a result of structural inequities rather than the inevitable result of *inherent* vulnerability. When it comes to toxic pollution, people living in poverty are likely to experience disproportionately high rates of exposure due to the proximity of industry to their homes, employment available to them, etc. While our long-term goals are not centrally aimed at changing social, economic, and political norms or systems, we do aim to positively impact groups marginalized by them.

## PURE EARTH'S LEAD INTERVENTION APPROACH

Since 1999, Pure Earth has tested numerous lead exposure reduction strategies and, informed by its successes, setbacks, and lessons learned, has developed its approach to reduce lead poisoning. It consists of five core elements which may be employed individually, or in varied configurations of two or more elements, depending on the scope and context of the intervention. The first three elements, in interventions where all three are employed (not always), are often implemented sequentially. The Communications element must be integrated within each of the other four elements. See **Figure 3**, below, for a graphic depiction of the approach.

1. **Health Surveillance:** Analyze the blood-lead levels of target population in the program area to determine the prevalence, severity, and the demographic and geographic distribution of lead poisoning.
2. **Source Analyses:** Assess consumer products, environmental media, and homes of a subset of those households surveyed through element 1 (as well as a control group) to identify the primary sources and exposure pathways that likely contribute most significantly to lead poisoning.
3. **Source-Specific Interventions:** Design and implement interventions to sustainably reduce lead concentration in sources and hinder exposure routes (e.g., contaminated site remediation) in order to decrease lead exposure among target populations.
4. **Country-Led Implementation Strategy/Institutionalization:** Support governments in developing their own capacities and programs to prevent, identify, and reduce lead exposures and poisoning.
5. **Communications:** Integrate communications within each of the other elements. Develop education and awareness raising campaigns to build support and encourage action among government, private sector, NGOs and community members. Share with key stakeholders the data, information, tools, and strategies necessary to build support and to justify, design, fund, and implement effective interventions.

Figure 3: Pure Earth 5-Element Lead Intervention Approach



## PRE-IDENTIFIED LEAD SOURCES & STRATEGIES FOR RISK REDUCTION



Annex 1.- Main  
Pre-identified

## OUTCOMES & INDICATORS TABLE

Outcome	Outcome Indicators	Illustrative Activity (Output) Indicators
<b>Long-term Impact Goals</b>		
Reduction of morbidity and mortality among children and, in the long-term, the general population, related to lead poisoning.		
<b>High-Level Outcomes (addresses Main Problem)</b>		
Reduction of the prevalence of lead poisoning among children and pregnant / lactating women, or other target populations, in intervention areas.	<ul style="list-style-type: none"> <li>• Percent of children and pregnant and lactating women, or target population, with elevated BLLs</li> <li>• Average BLL among children and pregnant and lactating women, or target population, in our intervention areas</li> </ul>	
<b>Intermediate Outcomes (address Main Causes)</b>		
Reduction of Sources of Contamination / Lead Concentration in Sources		
<p><i>Intermediate Outcome 1:</i> Elimination or reduction of lead hazards.</p> <p><i>(Includes site remediation and reducing presence or concentration of lead in products.)</i></p>	<ul style="list-style-type: none"> <li>• Number of hectares of contaminated soil remediated to less than standard or reference value</li> <li>• Percent of soil samples exceeding standard or reference value</li> <li>• Average lead concentration in a specific source (e.g., soil, dust, paint, pottery, metal cookware, spices, cosmetics, toys)</li> <li>• Percent of product samples (of specific type) exceeding standard or reference value</li> <li>• Percent of product (of a specific type) testing positive for lead</li> <li>• Percent of markets selling products (of a given types) that test positive (or exceed standard/reference value)</li> </ul>	<ul style="list-style-type: none"> <li>○ # soil samples taken</li> <li>○ # spice producers whose product tested</li> <li>○ # sites remediated</li> <li>○ # M<sup>2</sup> remediated</li> </ul>
Reduction of Human Exposure		
<p><i>Intermediate Outcome 2:</i> Reduction of human exposure to contaminated sources.</p>	<ul style="list-style-type: none"> <li>• Number of people exposed to a contaminated site</li> <li>• Number of people living in homes with lead paint</li> <li>• Percent of households that own/use contaminated items (e.g., paint, products, pottery)</li> <li>• Percent of workplaces that have / follow health &amp; safety guidelines</li> <li>• Percent of employees at applicable workplaces that have received health &amp; safety training</li> </ul>	<ul style="list-style-type: none"> <li>○ # HHs surveyed</li> <li>○ # products tested</li> <li>○ # markets sampled</li> </ul>

<b>Sub-Intermediate Outcomes</b> (address Underlying Causes)		
<p><i>Sub-Intermediate Outcome 1:</i> Increased research, data, knowledge, and awareness</p>	<ul style="list-style-type: none"> <li>• Number of signals of support from key global actors (e.g., formation of working groups, int'l commitments)</li> <li>• Actions/signals of support by NGOs/CSOs (produce &amp; disseminate assets, advocate)</li> <li>• Percent of target audience demonstrating knowledge or awareness about lead exposure (e.g., children, industry)</li> <li>• Number/percent people trained that demonstrate new or increased skills or knowledge</li> <li>• Percent social media audience growth</li> <li>• Percentage of target population making given behavior change (e.g., handwashing, use of PPE)</li> </ul>	<ul style="list-style-type: none"> <li>○ # peer-reviewed publications</li> <li>○ # knowledge products (case studies, research reports, guides) produced</li> <li>○ # of learning events and presentations (e.g., conferences)</li> <li>○ # of news stories, articles</li> <li>○ # new technologies, practices being researched or field-tested</li> </ul>
<p><i>Sub-Intermediate Outcome 2:</i> Strengthened regulatory systems</p>	<ul style="list-style-type: none"> <li>• Laws, policies, regulations, standards developed, modified, or adopted that address lead pollution</li> <li>• Number of actions taken in response to recommendations</li> <li>• Percent of industry in compliance with regs (or degree of compliance)</li> <li>• Number of firms or people that apply improved technologies/practices to reduce emissions or lead concentration</li> <li>• Industry upgrades &amp; process improvements to reduce emissions</li> </ul>	<ul style="list-style-type: none"> <li>○ # gaps identified, recommendations to policymakers, others</li> <li>○ # of “contacts” made between depts/orgs on regulatory recommendations (e.g., meetings, roundtables, co-authored articles)</li> <li>○ # of knowledge pieces on policies and regulations</li> </ul>
<p><i>Sub-Intermediate Outcome 3:</i> Increased resources and capacity to address lead pollution</p>	<ul style="list-style-type: none"> <li>• Number of “signals of support” from key actors towards taking on interventions begun through PE projects (e.g., cleanups, Vietnam)</li> <li>• Number/percent of people trained that apply new or increased skills or knowledge</li> <li>• Amount of new funding allocated/leveraged for lead programs</li> <li>• Number of key orgs/groups that adopt and apply improved tools, technologies, or practices</li> <li>• New (or improved) projects, programs, systems implemented by partners (e.g., BLL surveillance by gov't)</li> <li>• Replication or scaling of interventions</li> <li>• Gov't funds lead-dedicated staff/experts (Secondments)</li> </ul>	<ul style="list-style-type: none"> <li>○ Trainings, workshops</li> <li>○ Gov't, industry staff trained</li> <li>○ Curricula developed</li> <li>○ # new projects/programs funded by partners</li> <li>○ # gov't ministries/depts benefit from trainings</li> <li>○ # of improved of tools, technologies, practices developed</li> <li>○ # knowledge products, assessments, analytical reports, guidelines &amp; recommendations made widely available</li> <li>○ USD granted to local NGOs to address lead</li> </ul>