PURE EARTH

SOLVE POLLUTION.
SAVE LIVES.
PROTECT THE PLANET.

ANNUAL REPORT 2022 / 23

This page: Woman and child, Indonesia.
Cover photo: Children in Bangladesh. © Pure Earth Bangladesh/September 2021/Sabbir Hossain

CONTENTS

Use the QR code to access the full report online with additional detail about the work of our country offices.

LETTER

Pure Earth President Richard Fuller, and Executive Director Andrew McCartor

Dear Friends,

We are excited to share the milestones achieved in 2022–23: groundbreaking research reports, innovations in the field, and the increased attention on lead and mercury pollution by influential public and private partners as well as media.

Our momentum accelerates as we mark the three-year anniversary since we published *The Toxic Truth* with UNICEF revealing that 1 in 3 children around the globe is lead poisoned. More governments, organizations and investors are recognizing the severity of lead poisoning in low- and middle-income countries and the urgent need for action.

With this recognition, we are seeing increased interest in scaling cost-effective solutions and a growing belief that

1 in 3 children around the globe is lead poisoned.

directing more resources to this area will have lasting health and economic impacts—that this is a solvable problem.

The latest data from World Bank researchers published in the *Lancet Planetary Healt*h reveals a startling increase in the disease burden across lifespans, and IQ and economic loss from lead exposure and poisoning. These estimates represent impacts from a single year—2019.

In addition, lead exposure may help explain 27% of the learning gap between rich and poor countries, according to the Center for Global Development.

THE COST OF LEAD EXPOSURE—2019

CARDIOVASCULAR DEATHS

- **5.5 million** adults died from cardiovascular disease in 2019 due to lead exposure, six times higher than the previous estimate.
- **90–95%** of this burden was in low- and middle-income countries.

IQ POINTS LOST

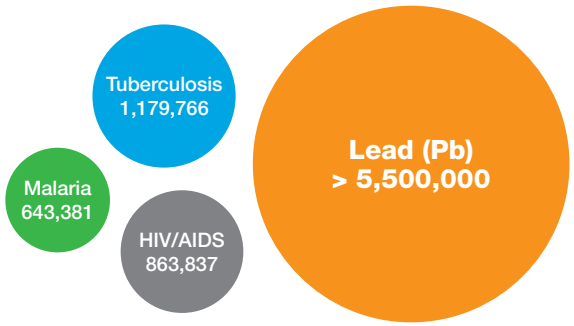
- Children under age five lost **765 million** IQ points.
- IQ loss in LMICs is nearly **80% higher** than a previous estimate.

COMBINED COSTS

- Lead exposure's global cost was **US$6 trillion** in 2019, equivalent to **6.9%** of global GDP countries.

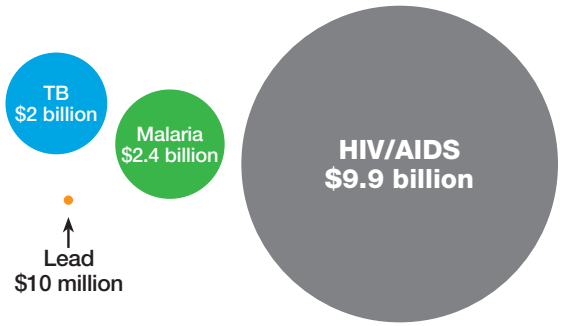
"Global health burden and cost of lead exposure in children and adults: a health impact and economic modeling analysis," *Lancet Planetary Health*, September 2023.

GLOBAL ANNUAL DEATHS



Source: IHME 2019/2020

INTERNATIONAL FUNDING



Source: IHME 2021

PURE EARTH INTERVENTIONS: COST EFFECTIVENESS

Contaminated Site Cleanup (17 PROJECTS)	**$2–$144 benefit per $1 invested**
Regulating Lead-based Paint (1 PROJECT)	**$1,200 benefit per $1 invested**
Eliminating Lead in Spices (2 PROJECTS)	**Up to $20,500 benefit per $1 invested**
Moving to Lead-free Pottery (1 PROJECT)	**$326 benefit per $1 invested**

This expanded understanding of the harmful effects of lead pollution and poisoning serves as a clarion call to action. Resources allocated to solving this public health threat must increase exponentially.

The extent to which this issue is under-resourced compared to other global health priorities must be recognized and acted upon accordingly. These charts [top of page] speak volumes.

The World Bank also recently published a benefit cost ratio analysis. They analyzed the return on investment of a range of Pure Earth's interventions and found promising results strengthening the case for an exponential expansion of replicable, low-cost interventions.

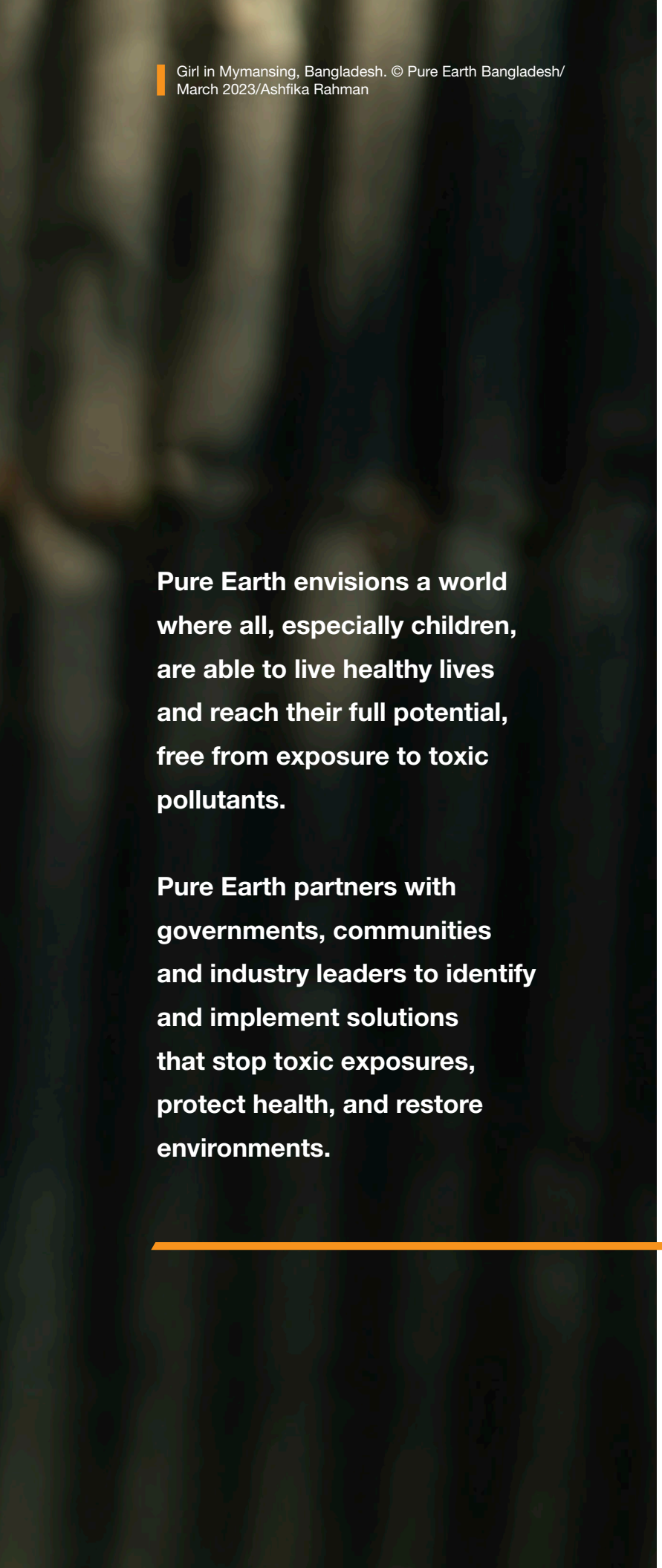
Pure Earth has been one of the few organizations working in this space, but this needs to change. More individuals and organizations across sectors—global health and development, education, environment, foreign aid, philanthropy, industry—need to participate in the solutions.

Join us!

Richard Fuller
PRESIDENT

Andrew McCartor
EXECUTIVE DIRECTOR

OUR VISION



Girl in Mymansing, Bangladesh. © Pure Earth Bangladesh/ March 2023/Ashfika Rahman

Pure Earth envisions a world where all, especially children, are able to live healthy lives and reach their full potential, free from exposure to toxic pollutants.

Pure Earth partners with governments, communities and industry leaders to identify and implement solutions that stop toxic exposures, protect health, and restore environments.

OUR FOCUS

Lead and mercury are two of the most prevalent pollutants in low- and middle-income countries, and pose a greater risk than all other top ten chemicals of concern identified by the World Health Organization. Because of widespread exposure, both toxicants have a significant impact on the trajectory of societies, causing disability, death, IQ loss, increased violence, restricted futures for poisoned children, and cardiovascular disease in adults.

WE PRIORITIZE actions to protect the developing brains and bodies of all people, especially children and pregnant women, who are affected by lead and mercury. We work to stop the multigenerational cycle of poisoning that is endemic in many low- and middle-income countries.

PROGRAMMATIC SOLUTIONS

LEAD

Childhood lead poisoning affects **1 in 3** children worldwide. **Over 90%** of these children live in low- and middle-income countries.

Our goal is to measurably and sustainably reduce lead pollution and poisoning where we work and to encourage and enable increased action by other stakeholders in the global health and development sphere.

Pure Earth's Global Lead Program strategy is designed around a framework consisting of five core elements that apply in all countries. This 5-phase approach was informed by our years of experience implementing **over 50 projects** in multiple countries to mitigate lead exposure.

Woman with a handful of spice.

5-PHASE APPROACH

1 / Health Surveillance

Conduct baseline blood lead level (BLL) testing and analysis to understand prevalence, severity and location of exposure.

2 / Source Analyses

Measure likely sources in homes where people have elevated lead levels, to determine the most significant sources of exposure.

3 / Source-specific Interventions

Design and implement a range of interventions to reduce exposures and the use or release of lead in products and industrial processes.

4 / Communications

Disseminate findings and recommendations to inform and build support with governments and funders for action.

5 / Country-Led Implementation Strategy

Support the implementation of strategies and programmatic approaches within Ministry operations.

Top to bottom: Blood lead testing in Bangladesh; Testing cookware for lead contamination in Bihar, India; Training in Ghana for the environmentally sound management of batteries; Community education visits; Pure Earth investigators talk to a woman in her home in Bihar, India.

PROGRAMMATIC SOLUTIONS

MERCURY

Mercury from artisanal and small-scale gold mining (ASGM) has eclipsed coal combustion as the largest source of mercury pollution in the world. ASGM activity releases an estimated 1,000 tons of mercury into the environment annually. **Up to 20%** of the world's gold comes from this highly-polluting mining method.

Mercury is particularly dangerous to young children, fetuses, and pregnant women. The mercury released into the environment knows no borders and contaminates rivers and oceans, fish and other marine animals, and eventually the global food chain. Pure Earth's Toxic Sites Identification Program has identified and assessed **over 500 sites** around the world where exposure to mercury threatens the health of the population.

Our Global Mercury Program strategy focuses on decreasing mercury emissions to the environment from the main source of pollution—ASGM—and reducing human exposures with an emphasis on the most severely affected populations, namely miners and surrounding communities.

Gold mined responsibly in the Peruvian Amazon by Pure Earth-trained miners using mercury-free techniques.

4-PHASE APPROACH

1 / Find Mercury Hotspots

Work with governments to identify and assess ASGM sites where mercury use is poisoning children and families and damaging ecosystems.

2 / Train Miners in Mercury-free Technologies

Train miners in safe and profitable mercury-free mining techniques; test a range of remediation approaches to remove mercury.

3 / Develop Demand Driven Programs for Mercury-free Gold

Work with partners to track gold that is made without mercury for the jewelry industry and investment community alike.

4 / Reforestation

Replant and restore regions of the Amazon rainforest stripped bare by mining activity. Native tree species are carefully selected for inclusion in landscape restoration. The species offer multiple benefits—ecological, medicinal, economic and more.

Top to bottom: Panning for gold; Miners in the Peruvian Amazon using a shaking table, a technique that allows them to to extract gold without mercury; A miner displays a ring he crafted using responsibly-sourced gold; A seedling that was planted in the Peruvian Amazon as part of Pure Earth's reforestation work to restore land damaged by mining.

2022/2023
SUMMARY OF KEY ACCOMPLISHMENTS

Following our revised strategic approach defined in 2021, we **planned our work** on lead and mercury pollution following a multi-phase solutions framework. Through 2022 and into 2023, we continued to **work the plan** and are seeing results.

Progress in Environmental Health Surveillance Systems

Blood Lead Level Testing Programs

Pure Earth collaborated with governments and implementing partners in conducting large-scale blood lead level (BLL) testing programs in several countries. The assessments are groundbreaking, most of which are taking place for the first time in these impacted countries. The data and analyses provide the underpinnings for national action plans and baselines to track progress and identify potential new sources of lead exposures.

- In Ghana, Pure Earth worked with UNICEF, the Ghana Health Service, and the Ghana Standards Authority to test approximately **3,000 children across 9 towns and 3 regions**;
- In Bangladesh, Pure Earth worked collaboratively with partners including Stanford University and icddr,b to test **500 pregnant women and 898 children** living in four northern rural districts;
- In Indonesia, working with partners, at the Faculty of Medicine at the University of Indonesia, Pure Earth tested **567 children**, along with **153 adults** living in four lead affected areas;
- In India, Pure Earth and Vital Strategies tested **697 children** and **55 pregnant women** in 8 districts across Bihar state. In addition, **120 children** were tested in Tamil Nadu;
- In the Philippines, Pure Earth, in partnership with the Food and Nutrition Research Institute of the Department of Science and Technology, continued a national BLL survey launched in 2021 of around **3,000 children ages 6 through 9, and pregnant women in 25 sites**;
- In Mexico, the National Health Service included BLL testing in its national health survey for the second time, providing critical surveillance continuity. In addition Pure Earth supported the National Health Service's analysis of lead poisoning prevalence, disease burden and associated economic costs.

Launch of New Program: Strengthening Health Systems to Reduce Lead Exposure

In the first half 2023, with a grant from **Takeda Pharmaceutical**, we began a program focused on strengthening health care systems in five countries to diagnose, treat and prevent lead poisoning, where more than 292 million lead poisoned children live. Pure Earth will

be collaborating with the ministries of health in Colombia, Indonesia, Kyrgyzstan, India (Maharashtra state) and Peru to design and implement new national programs to identify, monitor and reduce lead exposure. By enhancing clinical education and guidelines, strengthening health surveillance technology, and educating teachers and parents on the dangers of lead, countries will be able to better protect children and future generations from lead poisoning.

Groundbreaking Source Analysis Research

While we continued our toxic site investigations, we significantly scaled up our source analysis work and have completed an unprecedented global investigation, **The Rapid Market Screening (RMS) program**, collecting and testing over 5,000 products across markets in 25 low and middle-income countries. The RMS findings will provide future direction for research and interventions, and will contribute to the formulation of a set of global priorities to reduce lead exposure.

At the same time, our global teams also launched **Home-Based Assessments (HBA)**, with investigators following up on children who tested with elevated blood lead levels, visiting their homes to search for potential sources of lead. The findings allow our staff and partners to provide tailored recommendations for exposure risk reduction for individual children, their families and communities.

RAPID MARKET SCREENING

- **Largest assessment of lead in consumer goods and foods in low- and middle-income countries**
- **25 countries**
- **5000+ consumer products purchased and sampled from local markets**
- **Samples include paint, cookware, spices, toys, cosmetics and more**
- **Spices and cooking pots emerging as concerns**
- **Cosmetics, particularly kohl eyeliner, emerging as a concern in Northern Africa/South Asia**

HOME-BASED ASSESSMENTS

- **500+ homes of children with high blood lead levels were surveyed across seven countries.**
- **Investigators tested numerous items in households, including cookware, toys, spices, and makeup, and also water, soil and other surfaces in and around homes.**

Support for this work comes from GiveWell, the Effective Altruism Global Health and Development Fund, and Open Philanthropy.

Mexico
Above: Women potters from Pure Earth Mexico's Circle of Women program; *Right:* Lead-free pottery exhibition at Arts Morelos Museum.

Impactful Source-specific Interventions

LEAD

Pure Earth Bangladesh has completed three cleanups of severely lead-contaminated villages, and conducted blood lead tests and home-based source investigations. The team and partners also conducted pre- and post-project environmental and blood lead level sampling and analysis, as well as an education, awareness, and advocacy campaign. These remediation projects have ensured a lead-safe environment for hundreds of villagers, and the future generations.

Pure Earth Mexico's work promoting lead-free pottery while protecting traditional cultural heritage has expanded and now has a presence in four states, in part because many of our community potter training programs were adopted and successfully replicated by state health authorities and universities.

Pure Earth Mexico has also established ten Women's Circles in three states across Mexico. With family health assessments, technical training and support to market their lead-free pottery, the Circle of Women (Circulo de Mujeres) project helps grow the women's businesses while safeguarding the health and tradition of their families and future generations. To showcase the work of these women, Pure Earth Mexico organized a four-month long lead-free traditional pottery exhibition in the popular Arts Morelos Museum. The exhibition, the first of its kind, received the support of the country's cultural, health, and tourism officials.

Bangladesh
Clockwise, from top left: Pure Earth investigators taking a soil sample (© Pure Earth Bangladesh/April 2022/Abdullah Al Kafi); A boy in Mirzapur, Bangladesh, (© Pure Earth Bangladesh/April 2022 /Abdullah Al Kafi); A girl watches a Pure Earth crew at work in Mirzapur, Bangladesh (© Pure Earth Bangladesh/January 2022/Ashfika Rahman).

Peru
Clockwise, from top left: A training session in progress with miners in the Peruvian Amazon; A marker identifying the type of planting being used in an area undergoing reforestation; A gold mining concession in the Peruvian Amazon.

Colombia
Pure Earth's Alfonso Rodriguez accepts one of the four top prizes at the Artisanal Mining Grand Challenge on behalf of the Pure Earth team.

MERCURY

Award-winning innovation: In December 2022, Pure Earth's breakthrough copper plates technology was named one of the top winners of the global Artisanal Mining Grand Challenge competition. The solution is capable of removing as much as 84% of mercury from waste tailings from artisanal and small-scale gold mining. The prize money will enable the team to conduct more tests to ensure that the technology can be used by miners in remote areas that do not have regular water and electricity services.

First in Latin America: In June 2023, the Pure Earth team delivered the first mercury storage unit in Latin America to the regional environment authority for the Santander region of Colombia. The storage unit has a capacity of up to 300 liters exclusively for the temporary storage of metallic mercury. It is a first step in promoting the responsible disposal of mercury in the country, thereby reaffirming Colombia's commitment to the Minamata Convention. This also serves as a model for replication.

Pilot project yields quick results: Pure Earth is working with miners in the Peruvian Amazon to transition their mining practices to more responsible, mercury-free methods of gold mining. With support from the global jewelry company Brilliant Earth and alongside project partner Alliance for Responsible Mining (ARM), four Peruvian mines are on the cusp of becoming the first in the Amazon to become Fairmined-certified, a label that assures buyers that their gold comes from responsible mining.

Reforestation expands: In the Peruvian Amazon, Pure Earth helped miners plant over 5,000 new seedlings in 3.25 ha of a mining concession, bringing the amount of rainforest restored to over 10 hectares, with a survival rate at over 71%. Pure Earth researchers also completed research that revealed how reforestation slows mercury dispersal, and performed innovative research on improving soil conditions for newly reforested species.

Dr. Francesco Branca (Italy), Director, Department of Nutrition and Food Safety, World Health Organization, Health For All Film Festival Juror, holds up the Grand Prix prize awarded to Pure Earth Bangladesh at the awards ceremony, which streamed live to a global audience on June 6, 2023.

Raising Awareness

With communications operations established in several Pure Earth offices, awareness of the issues and the impact of our work is reaching millions more people.

Pure Earth's six-minute film, "One in 36 Million," won the **Grand Prix prize at the 2023 World Health Organization (WHO) Health For All film festival** in the Better Health and Well-being category. The documentary tells the story of a boy suffering from acute lead poisoning in Bangladesh. WHO judges called the film "captivating" and "personal," and with the award, provided the film access to a global audience to spread its message of hope and solutions. Another Pure Earth film "The Lead Rush," documenting our successful intervention in a lead poisoning emergency in Senegal, also made the finals of the festival.

- Pure Earth India, in collaboration with The Energy and Resources Institute (TERI), organized a seminar, *Understanding Lead Poisoning*

> **"The lesson (of the film) is that there is something you can do about it. Health authorities, civil society, government authorities can first of all identify the issue, and then they can act on it and prevent many more from being affected."**
>
> **—DR. FRANCESCO BRANCA**
>
> World Health Organization (WHO) Director, Department of Nutrition and Food Safety, 2023 WHO Film Festival Juror

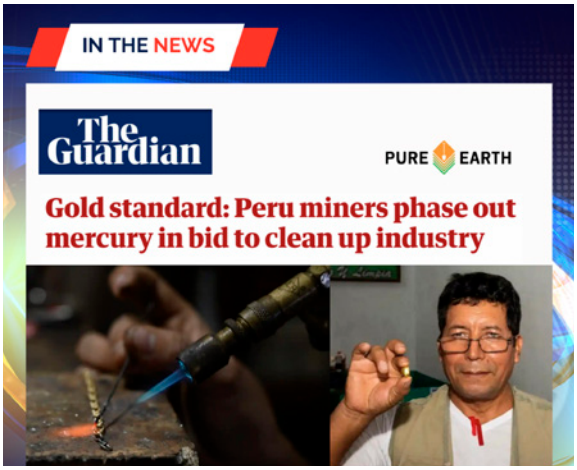
Pure Earth President Richard Fuller speaks in India.

Prevalence in India, in October 2022 to share a review, *Assessment of Lead Impact on Humans and India's Response*, from the Indian government think tank NITI Aayog. This important review validated the data from the Pure Earth and UNICEF report *The Toxic Truth*, which estimated that more than 275 million Indian children are lead poisoned–that's more than 50% of the children. More than 200 people attended the event in-person, and many more watched the live stream. As a result, more than 180 media hits were reported about the event and the issue.

- In April 2023, Pure Earth India, along with the Center for Global Development, Pahle India Foundation, the Asian Development Bank and UNICEF, followed up by organizing a high-level meeting exploring opportunities for the government to take a leadership role in the national and global fight against lead poisoning via its **G20 Presidency**. That event reached approximately 47 million people with reports in prominent local news outlets.

> ***The Toxic Truth* estimates that more than 275 million Indian children are lead poisoned—that's more than 50% of the children.**

- Pure Earth's work in Peru helping miners go mercury free **made the front page of *The Guardian*** with the report *Gold standard: Peru miners phase out mercury in bid to clean up industry*. The timing of the publication, just before Earth Day, expanded the report's global reach, and increased awareness among both the jewelry industry and consumers about the problem and the solutions implemented by Pure Earth.



- In May 2022, The ***Lancet Planetary Health*** journal published a progress report updating the 2017 Lancet Commission on pollution and health. The report was covered by over 250 news outlets worldwide reaching an audience of over 650 million.

Spices in a Georgian market.

Expanding Partnerships

Given the scale of the lead pollution problem, with 800 million children poisoned and little resources dedicated to solutions, convincing more organizations to take on this issue is a high priority. Here are a few examples of progress:

- Our partnership with **UNICEF** began in 2020 following our joint publication of *The Toxic Truth*. Pure Earth and UNICEF teams in country offices are now working together to address children's environmental health with a focus on lead poisoning.
- **Vital Strategies**, a global public health organization, is now an implementing partner in several countries working with Pure Earth country teams to strengthen health care systems to detect, prevent and treat lead poisoning.
- Researchers at **Stanford University** have worked with Pure Earth on a number of projects to identify lead contamination in spices. Along with other partners, current work includes an effort to identify spice supply chains in North India to understand the scope of spice adulteration in 36 cities across six states. More than 300 samples of spices have been collected and are being tested.
- Pure Earth works collaboratively with **The Lead Exposure Elimination Project (LEEP**), sharing data and best practices. LEEP's focus on lead paint as a source of exposure compliments Pure Earth's expertise on other major lead sources, such as the improper recycling of used lead-acid batteries and consumer products like spices. Together, our combined knowledge base provides a clear picture to decision-makers on the cost effectiveness of lead intervention projects.

Policy and Advocacy

- The **Center for Global Development** (CGD) has emerged as a strong policy, advocacy and research partner, inspired to take up the issue based on *The Toxic Truth* report. CGD convened the Global **Lead Working Group**, a coalition of leading researchers and practitioners in the field representing over 20 organizations, including Pure Earth. The working group was invited to brief a 2023 G7 workshop on the scope and urgency of the global lead crisis.

- The **G7** issued a strong statement against global lead poisoning in its 2022 Environment Ministers' Communique. This was the result of a multi-year effort, in part spearheaded by the **Global Alliance on Health and Pollution** (which was initiated by Pure Earth), to move the G7 to include lead in its agenda. In November, 2022, Pure Earth was invited to a G7-hosted workshop on lead to brief participants about lead as a major threat for human health and the environment. G7 members then reiterated their commitment at the Environment Ministers meeting.

- Pure Earth continued its collaboration with the **Global Alliance on Health and Pollution** in advocacy efforts, bringing key messages to low-and middle-income countries, and during the UNEA 5.2 negotiation process, to call for a science-policy panel to address pollution. On March 2, 2022, the United Nations Environment Assembly agreed, leading to the establishment of the **first UN Science-Policy panel** to contribute to the sound management of chemicals and waste and to prevent pollution.

- In the U.S., the Congress, for the first time, directed funds to specifically reduce lead pollution in low- and middle-income countries in the form of $6 million in appropriations. Pure Earth commends political leaders, including now retired **Sen Patrick Leahy** (VT) and **Congresswoman Debbie Dingell** (MI), who acknowledged our efforts in "…bringing attention to the severity of childhood lead poisoning worldwide."

DONORS

Corporations and Foundations

American Paper & Supply Company
Andrea Jose Castro
Ani Khachian
Architectural Floor and Care
Barbara Hope Foundation
Bario Neal
Bengal Finance & Investment PVT LTD
Bondeye Jewelry
Boston Properties
Brilliant Earth
BRK Family Foundation
Building Maintenance Services, LLC
Christina Malle Jewelry
Clarios Foundation
Conservation X-Labs
Corporation Bioparque
Covington and Burling LLP
Cowen and Company
Cynergy Trading Corp
Dana Bronfman Jewelry
Delphine Leymarie Fine Jewelry
Dillon Gage
Effective Altruism Global Health and Development Fund
Ethical Metalsmiths
ExxonMobil
Ezoic
Facebook
Frederick Goldman
Frontstream Panorama Global Impact Fund
Futura
GiveWell
Good Ventures Foundation
Great Forest
Guggenheim Securities, LLC
Hi June Parker Fine Jewelry
HipGive
Imperial Dade
Indus Charitable Foundation
Interstate Waste Services Inc.
Jaguar Health, Inc.
JL Local LLC
Joshua Mailman Foundation
KBH Jewels
Koop King Multi-Purpose Cooperative
Latham & Watkins LLP
Latino Community Foundation
LOLiDE
Made Line Jewelry
Magnolia Bakery
Maria Irene Weinz Jewelry
Maya Kini
Melissa Joy Manning Jewelry
Merzatta
Microsoft
Mina Stones
Nails by Meech LLC
National Philanthropic Trust
Oak Foundation
Open Philanthropy
Phyllis Bergman Consults
R&R Scaffolding
Roux
Roy J. Zuckerberg Family Foundation
Sandrine B Jewelry
SDC Designs
Susan Crow Studio
Surreal Diamond
Takeda Pharmaceutical Company Limited
Tauw Foundation
TEI Group
Temple St. Clair LLC
The Giving Block
The Sarah Sebulsky Foundation
TogoRun
Tokio Marine HCC
Trafigura Foundation
Truss and Ore Jewelry
Wend Jewelry
Women's Jewelry Association
WWake

Government/ Bilateral Donors

Colombia Ministry of Mines
Germany, German Federal Ministry of Nature Conservation, Buildings and Nuclear Safety (BMU)
Global Environment Facility (GEF)
UN Development Programme (UNDP)
UN Environment (UNEP)
U.S. Department of State (DOS)

Individuals

Lisa Arrowood
Fabian Bachrach
Ron Bagel & Meg O'Brien
Andrew Baris
Carol Beebe
William Bennett
Ms. Ann Berdy
Dorian & Jeffrey Bergen
Kim & Ian Bickley
Douglas Biggs
Joel Bluestein
Michele Blumberg
Kavitha Bondada
Karen Bradunas
Fari Breguet
Paul Brooke
Erin Brown
Carol Browner
Nancy & John Buchanan
Brian Burgess
Michael Burghardt
Kathryn Burns
Thomas Buser
Dr. David Butruille
Jack Caravanos
Lance Carlile
Michael Chadwick
Elizabeth Chandler
Allison Charalambous
Lee Chasen
Emily Chelsea

Jeffrey & Robin Cherwinka
Eugene Choi
Teresa Christopher
Kate Collins
Lisa Conte
Richard Crane
Darryl Dahlheimer
Lauren Davidson
Alena Derby
Gretchen Vivier & Steven Derby
Rohit Dhomadiya
Michael Doherty
Frederic Durand
Robert Erck
Edward Ezgilioglu
Griff & Robert Fairbairn
James Ferrari
Howard Fischer
Jabbar Ford
Andrew Foreman
Richard Fuller
Val Galella
Kiran Golakiya
Brandon Gonsalves
Woody Heller & Elizabeth Gordon
Yvonne Gorman
Sebastian Grubb
David Harkin
Stephanie Hausner
Charlie Stewart & Caterina Heil
John & Felicia Hendrix
Mayra Hernandez Gonzalez
Jascha Hoffman
Stefanie Horn
Howard Hu
Marion Hunt
Claire Illich
Glo Janata
Robert Jonap
Barbara & Kevin Jones
Cary Jones
Don and Annie Jones
Sheldon Kasowitz &
Kathryn Huarte
John Keda
Christopher & Jacqueline Kelly
Ian & Tracy King
Dennis & Kelsey Kleinman
Jonathan Kowalski
Rubén & Elizabeth Leiman Kraiem
Owen LaFreniere
Allen T. Lamb
Ellen Landress
Peter & Rebecca Lang
Jill Langley
Ilana & Josh Levine
Patrick Loftus Hills
Marcy Loomis
Catherine & Steven Lufkin
Lawrence Lunt
Adele Malle
Christina &
Guillaume Malle
Timon Malloy
Ira May
Matthew McAvoy
David & Katherine Bruce Mechner
Ankit Mehta
Amit Mehta
Conrad & Sarah Meyer
Rob & Amy Morton
Seth Miller
Diana Mkhitarian
Steven Mueller
Samita Bhattacharya &
Joydeep Mukherji
Anna Mutoh
Sara Nayeem
Elizabeth Nestor
Wendy Nolen
Bradley O'Keefe
Stephen O'Rourke
Gary Ostroff
Tracey Ott
Tejash Patel
Elliott Pearce
Richard Perl
Janice Perlman
Edward Perrotte
Kathy Perrotte & Marla Pasquale
Toby Pomeroy
Andrea Pooler
Christopher Proce
Karen Quandt
Kate Rabinowitz
Ira & Diana Riklis
Pat Roberts
Marina Rohe
Janet Roos
Andrea Rosen
Anne Rush
Nancy Sammon
Karti Sandilya
Paul Sanfilippo
Jessica Sawyer
Ethan & Emrah Sawyer
Amanda Schellaci
Gilda Sherwin
Stuart & Susan Shikiar
Valerie Sirtoli
James Snowden
Arpine Stein
Viki Steinberg
Jen Stork
Dreadnaught Stubbs
Jitu Surani
Ian Taylor
Stephanie Terry
Benjamin Thompson
Kevin & Laurie Thompson
Charlotte Triefus &
Lloyd Zuckerberg
Jade Ullman
Kara Unterberg
Janet Vinyard
Bhavesh Virani
Andy Washkowitz
Marc Weinreich
Natacha & Anthony Weiss
Ian Wendt
Mark West
Susan Wilmink &
Thomas Schneck
Robert Wolf
Samantha & Scott Zinober
Dina Zuckerberg
Barbara Zuckerberg
Henry Zuckerberg

PURE EARTH BOARD

It has been both an honor and a pleasure to serve as the chairman of Pure Earth for the last ten years. The organization's growth during this time has been amazing, and I can't imagine a better person to take Pure Earth on the next leg of its journey than Ethan.

—CONRAD MEYER III
Pure Earth Chair Emeritus

As Pure Earth's Board Chair for the past decade, Conrad Meyer has steered our organization through a period of tremendous growth and impact. We are deeply grateful for his leadership as well as the commitment from our entire Board. We are now delighted to announce that Ethan Sawyer, our Treasurer, is stepping up to serve as our new Chair, and Conrad will remain on the board as Chair Emeritus.

PAUL BROOKE
Managing Member, PMSV Holdings LLC

RICH FULLER
Founder and CEO, Pure Earth

FRANCOIS GUILLON
Pure Earth Campaign Co-Chair
Senior Vice President, Omni Planning

HOWARD HU, MD, MPH, ScD
Chair of the Department of Population and Public Health Sciences, Keck School of Medicine of the University of Southern California

KATHRYN HUARTE
Founder, Huarte Advisors

TABASSUM INAMDAR
Independent Researcher, Tameel—Impact Strategy Research

GLORIA JANATA, JD
Pure Earth Campaign Co-Chair
President & CEO, TogoRun

CONRAD MEYER III
Pure Earth Chair Emeritus
Private Investor, Founding Member
of Lehman Brothers Mergers and Acquisitions

ANNA MUTOH
Finance Research Consultant,
NewsPicks Contributing Journalist

ALICIA OGAWA
Pure Earth Campaign Co-Chair
Director, Project on Japanese Corporate
Governance and Stewardship,
Columbia University, Center on Japanese
Economy and Business

PAUL ROUX
Chairman, Roux Associates, Inc.

ETHAN SAWYER
Pure Earth Board Chair
Senior Managing Director, Guggenheim
Securities, LLC

CHARLOTTE TRIEFUS
Pure Earth Nominating Committee Chair

I have learned so much during my years as a board member under Conrad's leadership. I am deeply committed to Pure Earth's mission and I am honored that the Board has entrusted me to help guide Pure Earth through its next phase of growth.

—ETHAN SAWYER
Pure Earth Board Chair

LEADERSHIP COUNCIL

FAATIHA AAYAT *
Writer, child rights activist and a climate campaigner

DANA BRONFMAN *
Founder & Designer, Dana Bronfman Modern Fine Jewelry

PAT BREYSSE *
Director, ABET accredited Occupational and Environmental Hygiene Academic Program

TERESA R. CHRISTOPHER *
Head of Climate, Sustainability, and Environmental Policy, Amazon

MAUREEN CROPPER PHD
Distinguished University Professor of Economics, University of Maryland

DR. LUCIA COULTER *
Director & Co-Founder, Lead Exposure Elimination Project

LISA CONTE *
Founder & CEO, Jaguar Health & Napo Pharmaceuticals

BETH GERSTEIN
Co-Founder & CEO, Brilliant Earth

DAVID HUNTER
MBBS, MPH, ScD, FAFPHM
Richard Doll Professor of Epidemiology and Medicine, University of Oxford

MUKESH KHARE, PHD
Department of Civil Engineering, Indian Institute of Technology Delhi, India

RUBÉN KRAIEM
Senior Counsel, Covington and Burling LLP

BRUCE LANPHEAR MD, MPH
Clinician Scientist, Child and Family Research Institute, BC Children's Hospital; Professor, Faculty of Health Sciences, Simon Fraser University

BLANCA LI
Choreographer, dancer, filmmaker

KEITH MARTIN MD, PC
Executive Director, Consortium of Universities for Global Health

KAREN MATHIASEN
Project Director at Center for Global Development, former Acting Executive Director, World Bank Group

GREG MEDCRAFT
Director, OECD Directorate for Financial and Enterprise Affairs

* **DENOTES NEW MEMBER**

MATTHEW MODINE
Award-Winning Actor,
Environmentalist

CHEF GRACIELA MONTAÑO
Executive Chef, Founder, and
Owner of Aura Cocina Mexicana

RICK NEVIN, ECONOMIST
Economist and Author of
"Lucifer Curves"

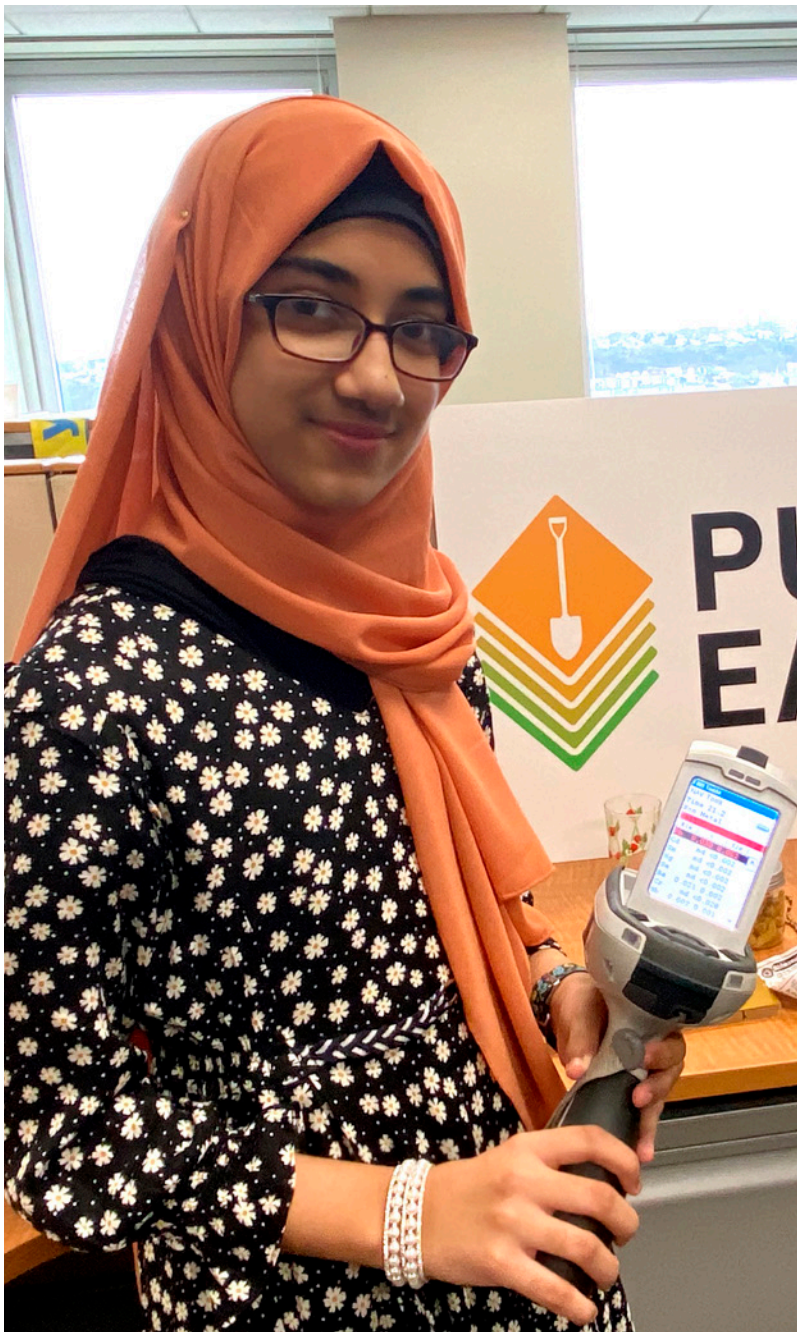
DEV PATEL
Actor, Activist

JANEZ POTOČNIK, PHD
Partner and Chairman,
UNEP International Resource Panel

JOHN A. PWAMANG *
Chief Consultant, Citep Consult
Limited, Accra

JAIRAM RAMESH
Member of Parliament, India

ELIZABETH TATE *
Vice President, U.S., Albright
Stonebridge Group



Pure Earth youth ambassador Faatiha Aayat visited our office in New York City to learn more about our work, and how we use the hand-held XRF (X-ray fluorescence) analyzer to detect toxins like lead in soil and certain products. Faatiha is committed to sharing our videos and messages with her large social media audience to help raise awareness about the childhood lead poisoning problem in Bangladesh, where her family is from.

2022
FINANCIAL STATEMENT

Consolidated Statement of Financial Position

Years Ended December 31, 2021–2022

	2022	2021
ASSET		
Current Assets		
Cash and Cash Equivalents	7,225,471	6,811,579
Grants Receivable	1,459,830	4,832,356
Pledges Receivable	200,000	73,167
Other Receivable	319,718	—
Prepaid Expenses & Other Current Assets	525,002	577,947
Total Current Assets	**$9,730,021**	**$12,295,049**
Grants Receivable–Non-current, net	5,038,601	799,994
Pledges Receivable–Non-current, net	91,860	80,000
Property & Equipment, net	409,186	416,628
Right of Use Asset, net	356,250	—
Security Deposit	27,486	26,253
Total Assets	**$15,653,404**	**$13,617,924**
LIABILITIES AND NET ASSETS		
Current Liabilities		
Accounts Payable	253,261	255,333
Accrued Expenses & Other Payables	353,106	228,148
Lease Liabilities—Current	173,851	—
Total Current Liabilities	**$780,218**	**$483,481**
Lease Liabilities—Non-Current	166,869	—
Total Liabilities	**$947,087**	**$483,481**
Net Assets		
Without Donor Restriction	1,514,059	494,326
With Donor Restriction	13,192,258	12,640,117
Total Net Assets	**$14,706,317**	**$13,134,443**
Total Liabilities and Net Assets	**$15,653,404**	**$13,617,924**

Consolidated Statement of Activities

Years Ended December 31, 2021–2022

	2022			2021		
	Without Donor Restrictions	With Donor Restrictions	Total	Without Donor Restrictions	With Donor Restrictions	Total
REVENUE & SUPPORT						
Grants	—	8,088,821	8,088,821	—	9,697,573	9,697,573
Contributions	308,610	505,793	814,403	415,327	19,060	434,387
Fundraising Income, net of cost of direct benefit to donors of $108,704 & $0	422,975	—	422,975	457,343	—	457,343
In-Kind Contributions	266,112	—	266,112	232,383	—	232,383
Net assets released from restrictions	8,042,473	(8,042,473)	—	5,696,123	(5,696,123)	—
Total Revenue & Support	**$9,040,170**	**$552,141**	**$9,592,311**	**$6,801,176**	**$4,020,510**	**$10,821,686**
OPERATING EXPENSES						
Program	6,938,581	—	6,938,581	4,845,063	—	4,845,063
Administration	937,431	—	937,431	1,039,563	—	1,039,563
Fundraising	528,302	—	528,302	646,006	—	646,006
Total Operating Expense	**$8,404,314**	**$—**	**$8,404,314**	**$6,530,632**	**$—**	**$6,530,632**
Excess of Revenue & Support over Operating Expenses	$635,856	$552,141	$1,187,997	$270,544	$4,020,510	$4,291,054
NONOPERATING ACTIVITES						
Employee Rentention Credit	319,718	—	319,718	—	—	—
Other Income	23,900	—	23,900	11,467	—	11,467
Foreign Currency Translation Adjustment	40,259	—	40,259	(10,612)	—	(10,612)
Change in Net Assets	**$1,019,733**	**$552,141**	**$1,571,874**	**$271,399**	**$4,020,510**	**$4,291,909**
Net Assets—Beginning	**$494,326**	**$12,640,117**	**$13,134,443**	**$222,927**	**$8,619,607**	**$8,842,534**
Net Assets—Ending	**$1,514,059**	**$13,192,258**	**$14,706,317**	**$494,326**	**$12,640,117**	**$13,134,443**

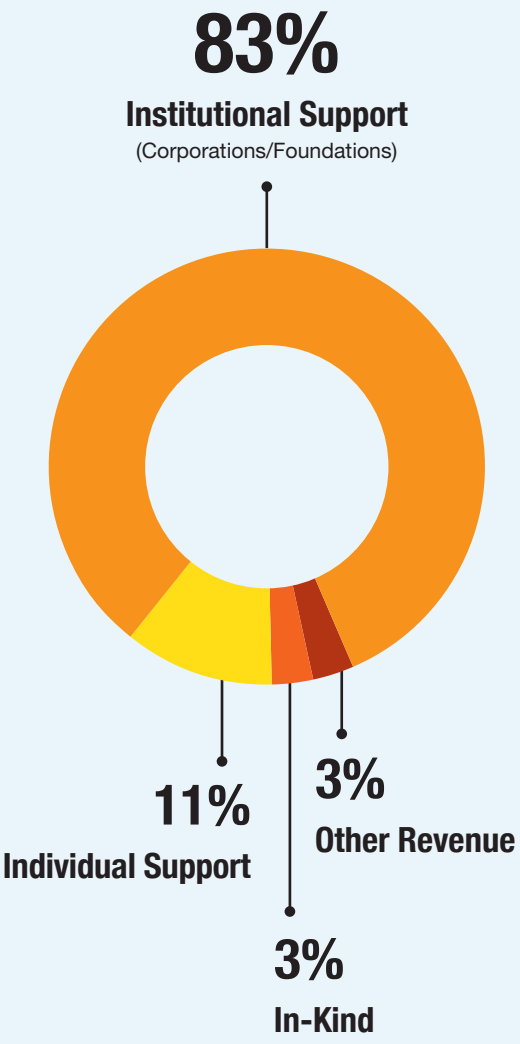
Consolidated Statement of Cash Flows

Years Ended December 31, 2021–2022

	2022	2021
OPERATING ACTIVITIES		
Change In Net Assets	1,571,874	4,291,909
Adjustments to Reconcile Change in Net Assets to Net Cash from Operating Activities		
Depreciation	118,003	97,895
Discount on Grants Receivable	438,526	—
Discount on Pledges Receivable	8,140	—
Amortization of Right of Use Asset	192,388	—
Change in Operating Assets & Liabilities		
Grants Receivable	(1,304,607)	1,784,848
Pledge Receivable	(146,833)	90,417
Other Receivable	(319,718)	—
Prepaid Expenses & Other Current Assets	52,945	253,804
Security Deposit	(1,233)	(1,253)
Account Payables	(2,072)	(522,186)
Accrued Expenses & Other Payables	124,958	77,170
Lease Liabilities	(207,918)	—
Net Cash Used by Operating Activities	**$524,453**	**$6,072,604**
CASH FLOWS FROM INVESTING ACTIVITIES		
Purchases of Property & Equipment	(110,561)	(160,903)
Net Change in Cash & Cash Equivalents	**$413,892**	**$5,911,701**
CASH AND CASH EQUIVALENTS		
Beginning of Year	**$6,811,579**	**$899,878**
End of Year	**$7,225,471**	**$6,811,579**

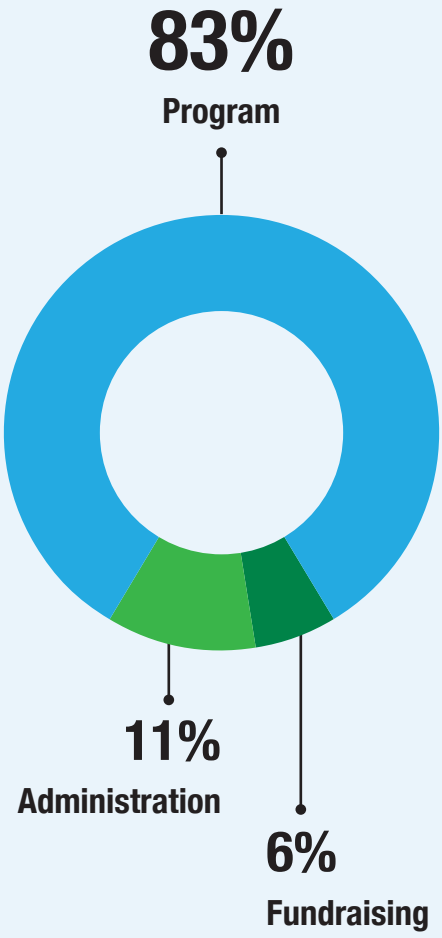
SOURCES OF FUNDS

2022



UTILIZATION OF FUNDS

2022



Give Well

"We think Pure Earth is the most promising giving opportunity we have found to address lead exposure." —GIVEWELL

★★★★ CHARITY NAVIGATOR
Four Star Charity

Give with confidence.
Pure Earth is a four-star charity.

HIGHLIGHTS BY COUNTRY

A woman being interviewed about lead exposures in a village in Bangladesh.

BANGLADESH

"Bangladesh is the 4th most lead-impacted country in the world, with 36 million children suffering from lead poisoning. That is why it is so important that our film about childhood lead poisoning was selected by the global panel of judges at the World Health Organization to receive the Grand Prix prize. These stories must be told. Our work to protect children is giving families hope. They can see our solutions working. They can see their communities become healthier and safer. And the world is watching."

—DR. MAHFUZAR RAHMAN
Country Director, Pure Earth Bangladesh

KEY PARTNERS:

Department of Environment (DoE); Ministry of Environment, Forest and Climate Change (MoEFCC); Directorate General of Health Services (DGHS); Environment and Social Development Organization (ESDO); Georgetown University; International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b); National Curriculum Textbook Board (NCTB); Khulna University; Stamford University; Stanford University; UNICEF Bangladesh; University of Dhaka; World Bank

DONORS:

Clarios Foundation; UK Foreign, Commonwealth and Development Office (FCDO); GiveWell; TAUW Foundation; UNICEF; FCDO; USAID

Rapid Market Screening

Bangladesh is one of 25 countries conducting the Rapid Market Screening study to identify common consumer products contaminated with lead being sold in markets around the world. Pure Earth investigators visited markets in four major districts: Dhaka, Rajshahi, Khulna, and Barisal, from December 2021 to July 2022, where they collected data and tested samples with an XRF (X-ray fluorescence) analyzer. Some of the samples, like vegetables, rice, and aluminum cookware went through a leaching test in a laboratory. Pure Earth **analyzed 197 samples from Bangladesh**, and of these, **24% exceeded the relevant reference levels**. Metal foodware, ceramic foodware, and paint stand out as product types that had a particularly high percentage of samples exceeding the reference levels.

Blood Lead Level Testing

Pure Earth Bangladesh worked collaboratively with partners including Stanford University and icddr,b to **test 500 pregnant women and 898 children** living in four northern rural districts of Bangladesh: Mymensingh, Kishoreganj, Tangail, and Gazipur, as well as in Munshiganj. icddr,b also tested 201 children before remediation efforts, and 168 children post-remediation in Mirzapur, Tangail. The baseline results showed children's blood lead levels (BLL) as high as 47µg/dL. UNICEF, together with the Institute of Epidemiology, Disease Control and Research (IEDCR) under the Protecting Every Child's Potential (PECP) project, tested 980 children in four districts—Tangail, Khulna, Sylhet, and Patuakhali.

These results helped to generate evidence and influence the government to initiate a national-level BLL survey to monitor the blood lead levels of children throughout the country as well as implement policy wherever required.

Home-Based Assessments

Pure Earth investigators are visiting homes to test household products such as metal cookware, spices, and toys, as well as courtyard soil, painted surfaces, and household dust.

Gaining more comprehensive insight into the origins of lead in everyday items can mitigate children's exposure to this harmful substance. Conducting a meta-analysis across countries allows us to grasp the potential sources of lead pollution by consolidating findings from various scientific studies conducted in different nations.

Pure Earth Bangladesh investigators have conducted home-based assessments in Mirzapur-Tangail, Khulna, Munshiganj, and Mymensingh districts. In Khulna, a **total of 47 houses were assessed** from April to June 2023, where high levels of lead were found in metal and ceramic cookware, toys, amulets, jewelry, and more. During the lead remediation intervention in Mirzapur, icddr,b collected and analyzed **environmental and household samples from a total of 147 households**. High levels of lead were found in turmeric powder and courtyard soil samples. A post-remediation home-based assessment and environmental sample collection has been completed in 124 houses. Under a project funded by GiveWell, a total of **78 home-based assessments have been conducted** in Munshiganj and Mymensingh districts. 40 more houses will be visited in Kishoreganj, Tangail, and Gazipur for further assessments under phase 2 of the study.

Assessing Toxic Sites

In 2022, Pure Earth **assessed 24 sites** in Bangladesh (out of 300) identified by the Toxic Sites Identification Program, where informal recycling of used lead-acid batteries was identified as a major source of lead pollution. Initial site assessments were conducted in six high-endemic lead poisoning areas to determine future lead remediation efforts.

In addition, Pure Earth investigators also conducted a survey of Sirajdikhan, Munshiganj district in March 2023 to identify sources of lead pollution around homes, from where blood was collected for blood lead level tests, and XRF (X-Ray fluorescence) measurements were taken for further assessment. A total of **17 industries and shops were identified** during the survey.

An investigator uses and X-Ray Fluorescence analyzer to test the ground outside a home in Bangladesh.

Ensuring Lead-Safe Environments for Communities

Following remediation work in Mirzapur, Tangail, which provided a **lead-safe environment for more than 600 villagers**, Pure Earth engaged extensively with the community in an education, awareness, and advocacy campaign. Community members were invited to share their experiences of being impacted by the once-active battery recycling operations. Posters, pamphlets, and social media posts were developed to reach residents. At the post-remediation assessment, the lead levels at hotspots in Mirzapur were found to have decreased to around 60–100 PPM from pre-remediation average level of 100,000 PPM.

Pure Earth Bangladesh, together with the Environmental Science Discipline of Khulna University, implemented a lead remediation project at Mohammadnagar, Khulna district. The three-month long project, completed in June 2023, included the excavation of toxic soil, the use of clean soil cover, and the cleaning of homes.

The Director of the Department of Environment, Khulna, attended a ceremony to mark the completion of the project, and planted trees in the lead remediated areas. Residents of the are now living in a lead-free, safe environment.

Rallying Support for Action on Lead

Pure Earth Bangladesh's online and offline campaign and advocacy strategy successfully reached about 50 million people to take unified action to solve lead pollution. **More than 200 social media posts were shared, which reached about 2.7 million people**. Pure Earth's work was covered in more than 200 local and international print and electronic media. Public events included national and district-level

seminars, film screenings, art competitions with youth groups, and more.

For International Lead Poisoning Prevention Week 2022, Pure Earth Bangladesh supported ESDO to organize a rally with hundreds of youths calling for action on lead poisoning. A community awareness video titled *Public Questions and Expert Answers* was produced with questions answered by experts from partner organizations including icddr,b, ESDO, DGHS, and UNICEF.

On World Environment Day 2023, the team, together with the World Bank, UNICEF, the Department of Environment, and Bondhu Foundation, organized a seminar, *Integrated Pollution Management for a Clean and Healthy Bangladesh and Green Growth*, to explore innovative solutions for addressing pollution. Pure Earth screened a video documentary during the seminar on home-based assessment tilted *Solving Lead Pollution: Identifying Sources of Lead Exposure.*

Influencing Action on Lead with Award-Winning Film

Pure Earth Bangladesh's six-minute film *One in 36 Million* was awarded the Grand Prix prize at the World Health Organization's Health for All Film Festival in the Better Health and Well-being category. The film tells the story of Saim, a child the Pure Earth team met during remediation work in Mirzapur, who is struggling with lead poisoning. The recognition from WHO has given the film access to an even bigger global audience, where Saim's story will help raise awareness about the issue in Bangladesh and around the world, and push decision makers to take action to help millions of children like Saim.

Building Capacity with Partners

Pure Earth's work addressing lead in Bangladesh was strengthened with the formation of a coalition with more than 10 organizations and institutions including ESDO, icddr,b, International Lead Association (ILA), University of Dhaka, UNEP, UNICEF Bangladesh, and Stanford University. Pure Earth Bangladesh has worked with partners on projects including the National Guidelines for Case Management, Monitoring, and Surveillance Systems; and training on the Benchmarking Assessment tools (BAT), which helped enable the Department of Environment (DoE), battery companies, and NGOs to ensure environmentally sound management of lead.

Including Lead Pollution in National Education Curriculum

Pure Earth Bangladesh has collaborated with the National Curriculum Textbook Board (NCTB) to have a consensus about including lead pollution in the national curriculum to maximize awareness around the issue. Pure Earth held a workshop with researchers and curriculum experts from the NCTB, Department of Primary Education (DPE), and teachers from government schools and colleges to exchange ideas and review the draft content.

The Pure Earth team with officials from the Attorney General's office, and a representative from the U.S. Department of State, after the delivery of the first temporary mercury storage unit to the regional environment authority for the Santander region of Colombia.

COLOMBIA

"At Pure Earth Colombia, we work in the present thinking about the future we want to see. The progress that we have achieved to date is largely due to the dedication and commitment of a technical team whose expertise has made Pure Earth Colombia's work recognized regionally as a benchmark of knowledge and innovation."

—LIZETH OLAYA ZAMBRANO
Country Director, Pure Earth Colombia

KEY PARTNERS:

US Department of State (DoS); United Nations Development Programme (UNDP); Environmental Protection Agency (EPA); Ministry of Environment and Sustainable Development (MADS); Ministry of Mining and Energy (MME); Ministry of Health and Social Protection, Ministry of Labor, Attorney General's Office; Colombian Geological Service, National Mining Agency and the Mining-Energy Planning Unit; Regional Autonomous Corporation for the Defense of the Bucaramanga Plateau (CDMB); Innova; Pontificia Javeriana University; Calimineros S.A.; Geoconsultores

Rapid Market Screening

Colombia is one of 25 countries involved in the project to identify common consumer products contaminated with lead being sold in markets around the world. **260 samples were collected from markets** across Colombia, with ceramic

foodware emerging as a cause of concern with 50% testing high for lead.

Strengthening National Health System to Address Lead Poisoning

Colombia is one of five focal countries that Pure Earth will be helping to build capacity to implement an effective national action plan to prevent, identify, and treat lead poisoning. Funded by the global pharmaceutical leader Takeda, the project will strengthen Colombia's national health system's ability to collect, store, and analyze childhood lead exposure data; provide training to improve local expertise, and raise awareness through the dissemination of information about lead exposure. The project will enable the government to plan, advocate for, and enact sound, cost-effective policies to address root causes of lead poisoning.

Identifying Toxic Sites

To date, Pure Earth Colombia has **surveyed 141 potential contaminated sites** as part of the Toxic Sites Identification Program. **61% of the sites were found to be contaminated** with mercury caused by small-scale artisanal gold mining activities, while 21% were contaminated with lead due to smelting activities from the recycling of used lead-acid batteries.

Recovery and Responsible Management of Mercury

With support from the U.S. State Department and other stakeholders, the Pure Earth Colombia team has been developing a method for the responsible and cost-effective recovery of mercury and gold from mine tailings, along with technical protocols for safely handling and storing mercury, and eliminating it from artisanal and small-scale gold mining.

In December 2022, Pure Earth's breakthrough copper plates technology was named one of the top winners of the global Artisanal Mining Grand Challenge competition for **developing a solution capable of removing as much as 84% of mercury** from waste tailings from artisanal and small-scale gold mining. Following the win, the team continued to conduct more tests to ensure that the technology can be used in remote areas that do not have regular water and electricity services. By March 2023, Pure Earth Colombia installed and delivered a copper plate unit to process contaminated tailings to a mining association in the Santander region. The team also expanded access to the technology by training more than 280 miners on the management of contaminated tailings using this technology.

In this report period, the team also accomplished a logistical and engineering triumph, developing the **first temporary mercury storage unit for use in Latin America**. In June 2023, following ten months of work, the team delivered the unit to the regional environment authority for the Santander region of Colombia. The unit was developed according to protocols for the safe handling and disposal of mercury at national and international levels, and adapted to meet the needs of the local government. The storage unit has a total capacity 18 liters of metallic mercury. It is an important step in promoting the responsible disposal of mercury in the country, and in reaffirming Colombia's commitment to the Minamata Convention.

Another important achievement during this period was the **creation of the National**

The Pure Earth Colombia team with a group of artisanal and small-scale gold miners they are training to implement responsible practices for the safe management of mercury-contaminated tailings.

Mercury Table. Pure Earth Colombia provided support to the Attorney General's Office on the effort, which included work to coordinate solutions between the different authorities and compliance with constitutional and legal functions. The goal is to ensure the protection of the environment and the collective rights of communities by reducing and eliminating the use of mercury, thus avoiding the irreversible impact on ecosystems and the health of inhabitants.

Testing and Building an Economic Model for Mercury Recovery

With funding from the UNDP (United Nations Development Program), Pure Earth Colombia conducted mercury recovery tests on **more than 90 tons of tailings** from different municipalities.

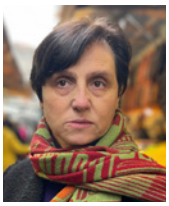
The team then conducted a financial evaluation, which showed the feasibility of the process, its profitability, and the economic return to the miner in a projection of five years of operation.

Developing Lead Mass Balance Methodology in Mercosur Countries

Pure Earth Colombia developed a methodology for calculating the lead mass balance for countries that are part of the Mercosur group, with information available for Argentina, Brazil, Paraguay and Uruguay. The tool will gather information and propose strategies for the management of hazardous lead waste.

Collecting spice samples from a Georgian market.

GEORGIA



"The result of our investigation was a revelation. No one knew that the spices we all have in our homes here in Georgia were poisoning our children. The good news is that other countries now can look at Georgia as a model for what can be done. We are gathering more data now that we can share. We have done it. Now you can too."

—KHATUNA AKHALAIA
Country Director, Pure Earth Georgia

KEY PARTNERS:

UNICEF; Stanford University; Tegata Motors; The Republic of Georgia government officials; National Center for Disease Control and Public Health (NCDC); Great Britain Health Security Agency

Producing a Country Case Study to Guide Global Interventions

Following the success of our work in Georgia, Pure Earth experts have been sharing details of the intervention with colleagues, government officials, and other decision makers around the world to show that even a national problem, such as the one in Georgia, where **41% of children were identified with lead poisoning**, can be solved quickly. Headed by the Georgian government, the collaborative effort which involved research institutions, UNICEF, Pure

Earth and others, had led to the identification of the source of lead poisoning, and the implementation of a solution, which halted the flow of contaminated spices into Georgian markets almost completely in under two years.

Pure Earth has been planning follow-up research and testing to capture and document the impact of the spice interventions on children's blood lead levels. The data collected will be used to produce a detailed case study that can be shared to help other countries address similar problems.

As our continuing research shows, lead-contaminated spices can be found in markets in many countries. With the global food supply chain, these spices reach homes far and wide, even in countries with more regulations like the U.S. In fact, part of the reason for the quick success in Georgia was Pure Earth's active research into sources of lead poisoning around the world. Pure Earth investigators knew what to look for when they began investigating products sold in Georgian markets because of a tip from the New York City health department, which had linked NYC children with high lead levels to Georgian spices.

Rapid Market Screening

Georgia is one of 25 countries taking part in the Rapid Market Screening program, which aims to identify products contaminated with lead that are sold in markets around the world. Pure Earth analyzed **186 samples from Georgia,** and of these, **12% exceeded the relevant reference levels**. Of note was the fact that all the samples of spices collected and were tested safe from lead. This seems to point to the continued success of the Pure Earth-assisted intervention

Testing spices for the presence of toxic lead using an XRF (X-Ray Fluorescence) analyzer.

at keeping contaminated spices out of Georgian markets. On the other hand, **48% of ceramic foodware appears to be a source of lead exposure**, potentially leading to lead leaching into food. We will be conducting leachate tests to determine the risks.

The Pure Earth Ghana team visited homes of children identified with elevated lead levels to identify potential sources of lead exposure in items like cookware and toys.

GHANA

"In 2019, 14% of Ghana's total land area experienced degradation. That is why I believe that Pure Earth's work in Ghana is so important, and I am proud that Ghana will be the flagship country in Africa for Pure Earth's work in reducing lead poisoning and pollution. My proudest achievement is to see people smile when their lives are impacted through key interventions."

—ESMOND QUANSAH
Country Director, Pure Earth Ghana

KEY PARTNERS:

UNICEF; Ghana Health Service; Ghana Standards Authority; Mountain Research Institute; Environmental Protection Agency; Roux Associates

Rapid Market Screening

Ghana is one of 25 countries taking part in the Rapid Market Screening program, which aims to identify products contaminated with lead that are sold in markets around the world. Investigators were deployed to cities including Accra, Kumasi, Tamale, and Takoradi, where they **collected 193 product and food samples** from markets across Ghana. Of the products analyzed, metal cookware has emerged as a concern with 55% of samples determined to have high lead concentrations. In addition, Pure Earth Ghana has also been coordinating Rapid Market Screening investigations for other African countries, including Nigeria and Kenya.

Ghana's First National Blood Lead Monitoring Program

In 2022, in collaboration with UNICEF, the Ghana Health Service and the Ghana Standards Authority, Pure Earth Ghana began blood lead

testing children in an attempt to build the first national lead monitoring program for the country. This would be an important step in any efforts to identify and treat lead poisoning cases.

Between Nov. 2022 and Jan. 2023, **over 3,227 children across nine towns and three regions were tested for lead**. The blood lead test results indicated that lead exposure was widespread among children in three areas, namely the Northern, Greater Accra, and Ashanti regions, with **53.5% of the children having elevated blood lead levels above 5 ug/dL**.

Home-Based Assessments

Pure Earth investigators **visited 293 homes of children** who participated in the blood lead level testing. These home-based assessments are aimed at identifying common sources of lead exposure found in and around homes.

Pure Earth investigators found a correlation between the children's elevated blood lead level results and the amount of lead contamination they found in metal cookware, soil around the home (from improper used lead-acid battery recycling, e-waste and other industries), and chilo traditional eyeliner that is widely used on children in the Northern Region, with some samples being made almost entirely of lead galena. The findings have been shared through high-level meetings with government officials.

Ghana Mapping Project

In 2022, Pure Earth Ghana began work to comprehensively map out toxic sites within ten districts in Ghana. There are **currently 217 toxic sites in Ghana** in Pure Earth's Toxic Sites Identification Program database.

Ghana school children from the Pure Earth club show off a sign they made about the dangers of lead poisoning.

Engaging Students

As part of Pure Earth Ghana's efforts to build a grassroots movement to respond to the lead crisis, the team organized an event at one of the largest senior high schools in Ghana to mark Earth Day. **More than 200 students and staff** attended the event to learn what Pure Earth Ghana was doing to protect children from toxic pollution. The team spent the day engaging the student community on the need to call on the government to invest in policies and programs that help protect the environment and health. Five national news outlets covered the event.

To mark International Lead Poisoning Prevention Week 2022, Pure Earth Ghana organized a one-day seminar at the Ghana Institute of Journalism in partnership with the nonprofit Curious Minds Ghana and UNICEF Ghana. About **300 high school and college level students** participated in the event.

Children at a school in India preparing to take a blood lead test.

INDIA

"There has been a noticeable shift in attitude among decision-makers, industry leaders, the press, and the public, who are now paying closer attention to the message we have been emphasizing. By gathering and sharing new and locally-sourced evidence and data on the sources and impact of lead on children, their health, and the resulting economic harm, this issue can no longer be disregarded. The good news is that there are solutions available and this problem can be solved. India's leadership in addressing childhood lead poisoning can set a great example for others to follow."

—LAVANYA NAMBIAR
Acting Country Director, Pure Earth India

KEY PARTNERS:

Stanford University; Indian Institute of Technology Delhi (IIT Delhi), All India Institute of Medical Sciences, Nagpur (AIIMS Nagpur); The Energy and Resources Institute (TERI, New Delhi); Pahle India Foundation (PIF, New Delhi); Vellore Institute of Technology (VIT, Tamil Nadu); Institute for Environment & Eco-Development (IEED, Bihar); Mahavir Cancer Institute & Research Centre (MCSRC, Bihar); Indian Society for Lead Awareness and Research (InSLAR, Lucknow); Vital Strategies; the Tamil Nadu Pollution Control Board (TNPCB); Bihar Pollution Control Board (BPCB); Indian Academy of Pediatrics (IAP, Mumbai); Public Health Foundation of India (PHFI, New Delhi); The Trained Nurses' Association of India (TNAI, New Delhi)

Rapid Market Screening

India is one of 25 countries taking part in the Rapid Market Screening project, which aims to identify products contaminated with lead

that are sold in markets around the world. In Maharashtra, Tamil Nadu and Uttar Pradesh, **a total of 257, 188 and 204 samples were collected respectively**. Foodware, paints and toys showed high levels of lead in Tamil Nadu and Maharashtra, while in Uttar Pradesh, spice samples exhibited elevated levels of lead.

Blood Lead Level Testing

Between December 2022 and March 2023, Pure Earth and Vital Strategies **assessed the blood lead levels (BLL) of 697 children and 55 pregnant women in 8 districts of Bihar**, namely Patna, Nawada, Vaishali, Bhagalpur, Muzaffarpur, Purnea, West Champaran, and Gaya. The results showed that more than 96% of children in urban Bihar and over 88% of children in rural Bihar had elevated BLLs above 5 µg/dL. In Tamil Nadu, **120 children** from Erode and Coimbatore were tested, along with **15 mothers from 7 villages**. Almost 85% of the children were found to have elevated BLLs.

Home-Based Assessments

In Bihar, children tested with blood lead levels (BLLs) above or equal to 20 µg/dL were selected for a detailed home-based assessment to determine potential lead sources within their houses. In addition, a 30% random sample of children with BLLs below 20 µg/dL was generated to create a comparison group. In total, **assessments were conducted at 152 households**.

A total of **1,762 samples, including cookware, cosmetics and toys, were tested** using a portable X-Ray Fluorescence analyzer (XRF). Over half the samples (approximately 55%) contained high levels of lead. Of particular concern was cookware—91% of the cookware assessed in homes were found to contain high levels of lead, which can leach lead into food. Investigators also found **lead adulteration in approximately 50% of spices** sampled in the homes.

In Tamil Nadu, following BLL testing at Erode and Coimbatore, Pure Earth investigators used an XRF analyzer to test samples collected during household assessments. A subset of samples have been sent to a lab for detailed investigation and validation of results. In total, the team collected more than 600 samples.

Assessing and Promoting Low-cost Methods for Detection of Lead

Pure Earth, Tauw, VIT and other partners in Tamil Nadu worked together to assess the performance and feasibility of low-cost detection methods for lead in soil and select consumer products, specifically spices. The team is in the process of comparing the results of conventional lead detection methods—including using an X-Ray fluorescence analyser and laboratory testing—against lower-cost methods, such as the use of portable laser spectrometry and image analysis to determine the presence of lead from digital photography, colourimetric tests and gravimetric tests. Recommendations will be made by the end of 2023 on the most economically viable and technically feasible method to screen lead-contaminated sites and consumer products.

Accelerating Awareness For Action

In 2022, the Indian government validated findings of *The Toxic Truth*, the 2020 groundbreaking report from Pure Earth and UNICEF that first brought attention to the global childhood lead poisoning crisis. Niti Aayog and the Council of Scientific & Industrial Research

A Pure Earth investigator uses an XRF (X-Ray Fluorescence) analyzer to test a child's toy in a home in India.

reviewed the report's data and findings for India, and concluded that the scale and intensity of lead poisoning in India, particularly of children, could not be ignored any longer. The Indian government's review, *Assessment of Lead Impact on Humans and India's Response*, confirmed Pure Earth's findings that more than half of India's children are significantly impaired from lead exposures.

To help bring attention to the review, the team organized a briefing, in collaboration with The Energy and Resources Institute, to share the data and discuss solutions for reducing and mitigating lead exposures in India. **Over 200 people attended the event**, which was also live streamed on YouTube, resulting in **180 media reports across India** about the issue.

This became the impetus for discussions with decision makers across the spectrum of Indian politics and industry, which pushed awareness of lead poisoning in the country to one of its highest levels ever, building momentum for change.

In April 2023, Pure Earth India, along with the Center for Global Development, Pahle India Foundation, the Asian Development Bank and UNICEF, followed up by organizing a high-level meeting exploring opportunities for the government to take a leadership role in the national and global fight against lead poisoning via its G20 Presidency. That event **reached approximately 47 million people** with reports in prominent local news outlets.

The team also convened the India **Lead Battery Working Group** roundtable with more than 20 stakeholders from the battery manufacturing and recycling industry, business associations, the government, and academic institutions to gather insights and recommendations to strengthen the newly released Battery Waste Management Rules (BWMR 2022), which is replacing the previous set of rules released in 2010. The recommendations were then shared with the chairperson of the committee for effective implementation of BWMR 2022, the Central Pollution Control Board and the Ministry of Environment, Forests and Climate Change.

Strengthening National Health System to Address Lead Poisoning

Maharashtra state in India is part of a global project that will take place in five countries, focused on building capacity to implement an effective national action plan to prevent, identify, and treat lead poisoning. Funded by the global pharmaceutical leader Takeda, the project will strengthen India's national health system's ability to collect, store, and analyze childhood lead exposure data; provide training to improve local expertise, and raise awareness through the dissemination of information about lead exposure. The project will enable the government to plan, advocate for, and enact sound, cost-effective policies to address root causes of lead poisoning.

Vendors at a market in Indonesia.

INDONESIA

"Pure Earth Indonesia has and will always position itself as a partner for the Government of Indonesia in efforts to mitigate the environmental and health impacts of toxic pollution. Our support is based on scientific data and lessons learned from the field which are the subjects of discussion with relevant stakeholders. Together, we hope that the resulting strategies and programs will benefit the environment, health and the people's economy."

—BUDI SUSILORINI
Director, Pure Earth Indonesia Foundation

KEY PARTNERS:

Ministry of Environment and Forestry; Ministry of Health; UNICEF; Yayasan Tambuhak Sinta (YTS); Sepuluh Nopember Institute of Technology (ITS); Occupational and Environmental Health Research Center, IMERI, Faculty of Medicine, University of Indonesia; planetGold; Health Polytechnic of Ministry of Health of Yogyakarta; Vital Strategies; the Government of Tegal Regency, Bogor Regency and Surabaya Municipality

Toxic Sites Identification Program

Pure Earth provided technical support to the Sepuluh Nopember Institute of Technology, Surabaya, to carry out initial site screenings on the islands of Java and Sumatra. Of the **95 locations studied** by the team, **60 locations were identified as polluted** with lead in soil (> 300 ppm), particularly from used lead-acid battery recycling activities. The results of the study are documented in

Pure Earth's Toxic Sites Identification Program database and reported to the Indonesian Ministry of Environment and Forestry (MOEF) to be included in a database that the MOEF references for determining the national priority list for remediation of hazardous wastes contaminated lands. With the MOEF's facilitation, the study results have been disseminated to the sub-national government.

At the request of the MOEF, Pure Earth Indonesia conducted further investigations in two main provinces on Sumatra Island.

Rapid Market Screening

Indonesia is one of 25 countries taking part in the program, which aims to identify products contaminated with lead that are sold in markets around the world. **176 samples were bought** from markets and analyzed, with **60% of metal cookware testing for high levels of lead**. In Indonesia, the findings seem to show that lead contamination does not only come from industries related to used lead-acid battery recycling, but also from consumer products people buy and use every day from their local markets. The team has shared preliminary RMS data with the government and together started to identify immediate interventions that can be done.

Strengthening National Health System to Address Lead Poisoning

Indonesia is one of five focal countries that Pure Earth will be supporting to build capacity to implement an effective national action plan to prevent, identify, and treat lead poisoning. Funded by the global pharmaceutical leader Takeda, the project will strengthen Indonesia's national health system's ability to collect, store, and analyze childhood lead exposure data; provide training to improve local expertise, and raise awareness through the dissemination of information about lead exposure. The project will enable the government to plan, advocate for, and enact sound, cost-effective policies to address root causes of lead poisoning. Together with the Ministry of Health (MOH), Pure Earth Indonesia and Vital Strategies are in the process of identifying the relevant technical units within the MOH involved in administration arrangements and project implementation. At the same time, with facilitation from MOH, the team will carry out a capacity assessment.

Blood Lead Level Testing

Working with the Occupational and Environmental Health Research Center, IMERI, Faculty of Medicine, University of Indonesia, Pure Earth Indonesia **tested 564 children**, along with **153 adults** living in four lead-affected areas and one control area in Java. The team also carried out home-based assessments in **145 houses**. Overall health and environmental activities involved—aside from four members from Pure Earth—24 medical doctors, seven enumerators, nine laboratory technicians and 53 health cadres from five study locations.

For children with clinical symptoms (anemia and suspected growth and development problems), the medical team issued referrals so that children get further care from primary health clinics. At each location, the team ended the activity by providing an interim report to the relevant offices, primary health clinics and regional hospitals. In parallel, the team has also coordinated with the Indonesian Pediatrician Society (IDAI) and, on July 20,

2023, disseminated IDAI's recommendations concerning lead intoxication in children. The results of this study will be provided to the central and regional governments to advocate the importance of addressing lead issues and supporting them in formulating strategies and approriate measures.

Risk Mitigation

Pure Earth Indonesia has been providing support, including scientific data, to the national and sub-national governments of Indonesia to support their initiative to remediate polluted sites on a national priority list held by the Ministry of Environment and Forestry (MOEF). In 2023, technical support for the government of Tegal and Bogor regencies was provided by Pure Earth Indonesia in order to fulfill the planning requirements for the remediation of hazardous waste-contaminated lands as stipulated in the regulations of the Ministry of Environment and Forestry.

In Tegal Regency, Pure Earth Indonesia and the Environmental Agency conducted scoping of lead-contaminated land outside the dumpsite that had been cleaned up by MOEF. Meanwhile, in Bogor Regency, Pure Earth together with the Environmental Agency and the Regency Development Planning Agency conducted **scoping of lead contaminated land in 3 villages**, namely Cinangka, Cinangneng and Ciomas. The results of scoping have been reported to the environmental agencies and MOEF. The Bogor Regency government used the scoping results as the basis for issuing a declaration letter of hazardous waste-contaminated lands in Cinangka, Cinangneng and Ciomas Villages. A coordination meeting attended by Pure Earth Indonesia and the provincial environmental agencies, and the government of Tegal and Bogor Regencies was organized to discuss plans for the remediation of hazardous waste-contaminated lands in the two regencies.

In addition, Pure Earth Indonesia has initiated a discussion with the Environmental Agency of Surabaya Municipality after observing lead contamination around a flea market where used lead-acid batteries were being bought and sold.

Health and Pollution Action Plan

As part of the Health and Pollution Action Plan (HPAP), which has been successfully included in the Regional Development Plan of Central Kalimantan Province, Pure Earth Indonesia along with the Global Alliance on Health and Pollution (GAHP) and Tambuhak Sinta Foundation provided technical support to the government of Katingan and Gunung Mas regencies to develop local action plans for mercury reduction and elimination. In Katingan Regency, the government held a public hearing to disseminate the action plan and initiate the formation of a working group. In Gunung Mas Regency, baseline data was collected and drafting of the action plan is in progress.

With Indonesia holding the G20 presidency in 2022, Pure Earth Indonesia worked with GAHP to collaborate with the MOEF on a webinar entitled *Good Practices of Circular Economy to the Quality of Environment and Health*, which was attended by approximately 525 participants.

Capacity Building

In collaboration with the Ministry of Environment and Forestry, Pure Earth Indonesia held

Pure Earth team members visit markets in Indonesia as part of the Rapid Market Screening project.

workshops on identifying hazardous waste-contaminated lands. The activities carried out by combining theory in the classroom with field practice were attended by staff from the environmental agencies at the provincial and regency levels, as well as UNICEF and Vital Strategies.

In preparation for carrying out blood lead level studies in lead-affected areas, Pure Earth Indonesia, in collaboration with OEHRC IMERI FK-UI, conducted a training workshop attended by participants from Pure Earth Indonesia, University of Indonesia, Health Polytechnic of the Ministry of Health of Yogyakarta, Muhammadiyah University of Tangerang, and Prodia Occupational Health Institute. Furhermore, the team provided training to health workers in Tegal Regency.

Supporting Governmental Efforts

Pure Earth President Richard Fuller and Gabriel Sanchez Ibarra, V.P. for Programs, visited Indonesia and met with national government stakeholders, health experts, bilateral institutions, and embassies to share updated data on global lead poisoning, and to support work to strengthen Indonesia's health system to reduce lead exposure. Both the Ministry of Environment and Forestry and the Ministry of Health have expressed interest in forming a lead working group for inter-sectoral discussion to address lead issues.

Trained by Pure Earth, these artisans now use lead-free glazes to produce their pottery, keeping this important cultural tradition safe.

MEXICO

"Pure Earth has opened up a world of possibilities to help improve life, mainly for those most in need in Mexico. Every action and every minute is crucial. Our work with potters, who hold the soul of our tradition and the power to protect our communities in their hands, continues to transform lives. There is no greater joy than to honor our commitments to those we are dedicated to help."

—AGUSTÍN GAMA
Country Director, Pure Earth Mexico

KEY PARTNERS:

Clarios Foundation; Fondo Canadá para Iniciativas Locales; Fundación Deacero; IMSS; CSG (General Health Council); INSP (National Institute of Public Health); Universidad Iberoamericana campus Puebla and Santa Fé; Tecnológico de Monterrey Campus Santa Fe, Lago de Guadalupe and Ciudad de México; Instituto de Fomento Artesanal del Estado de Tabasco; Secretaría de Cultura y Turismo del estado de Puebla; Municipio de Atlixco, Municipio de San Bartolo Cohuecan y Municipio San Marcos Acteopan en Puebla; Municipio de Tlayacapan en Morelos; Consejo Coordinador Empresarial; Museo de Artes Populares del Estado de Morelos; Cultura Sin Fronteras; American Society of Mexico; Green Tank; Secretaria de Salud.

Rapid Market Screening

Mexico is one of 25 countries taking part in the Rapid Market Screening program, which aims to identify products contaminated with lead that are sold in markets around the world. Pure Earth **analyzed a total of 206 samples** from Mexico, and of these, **17% exceeded the relevant reference levels.** Ceramic foodware, metallic foodware, paints, and toys emerged as the products with the highest percentage of samples exceeding the relevant reference levels, with **67% of ceramic cookware testing for high levels of lead**.

CREA (Centro de Recursos Alfareros)

Pure Earth Mexico has started the creation of an educational website, where artisans can find all they need to create lead-free pottery. This website will continue to be developed alongside Universidad Iberoamericana. These materials will enable Pure Earth expertise to reach more traditional potters, who often live in rural areas.

Barro Aprobado

As part of our program to promote lead-free pottery while protecting traditional pottery cultural heritage, Pure Earth Mexico **conducted 31 training workshops**, **coordinated 24 pottery fires** in an innovative kiln designed by the team and the potters, and participated in five pottery sales events in 2022. During 2023, **34 training workshops were conducted**, and we participated in seven pottery sales.

Because many of our community training programs were adopted and successfully replicated by state health authorities and universities, Pure Earth Mexico's programs have expanded and now have a presence in four states (Puebla, Morelos, Tlaxcala, Tabasco) with an estimated number of **384 new potters producing lead-free glazes today**.

In addition, during this period, a total of **95 restaurants and boutiques joined the program to use lead-free pottery**. The team also facilitated the exchange of lead-glazed pottery for lead-free alternatives to 12 street vendors in Mexico City.

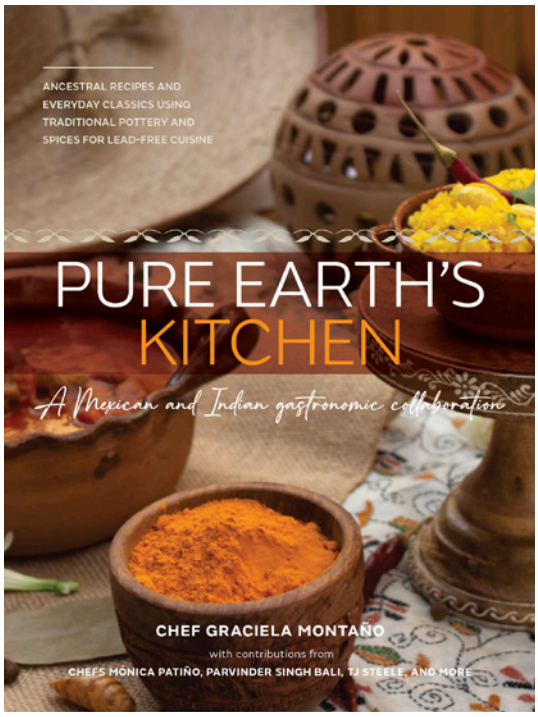
Circle of Women (Círculo de Mujeres)

Pure Earth Mexico organized five national gatherings to reach new potter communities to expand the Círculo de Mujeres Hechas de Barro program, which supports women in lead-free pottery production in rural communities.

The team w**elcomed 40 potter families and built 21 communal kilns** using a more efficient design developed by the team. To date, Pure Earth Mexico has established ten women's circles in three states across the country.

In 2023, Pure Earth Mexico organized a four-month long lead-free traditional pottery exhibition in the popular Arts Morelos Museum to showcase the work of the women trained in the program. The exhibition, the first of its kind, received the support of the state's cultural, health, and tourism officials and **received 4,200 visitors** from Mexico and other countries.

With the aim of supporting the Círculo de Mujeres workshops, the Pineda Covalin brand donated ties, scarves, umbrellas, fans and dominoes that are being sold in different bazaars.



Women potters are learning ways to protect their families and communities from lead exposure, and exploring opportunities to expand their lead-free pottery business as part of Pure Earth's Circle of Women program.

Lead-Free Food Alliance (Alianza Comida Sin Plomo)

In 2022, Pure Earth Mexico celebrated the first anniversary of the Alliance with 27 allies and three events. The group **conducted 159 blood lead level tests and coordinated 1,000 more** with the government, **registered 323 lead-free pottery vendors**, and **organized nine conferences**. Established by Pure Earth Mexico, the Alliance is the only one of its kind that represents all Mexican pottery stakeholders at various levels.

Pure Earth's Kitchen Cookbook

In 2022, Pure Earth published a cookbook curated by Chef Graciela Montaño, a Pure Earth ambassador based in Mexico. The cookbook features recipes from Mexican and Indian chefs, and tips on how to keep food and kitchens safe from toxins. The cookbook is available for purchase with proceeds supporting Pure Earth's work. The cookbook has also become a valuable tool for raising awareness, especially about contaminated foods like spices, and about the need to clean up pollution at the source, before it enters the global food supply chain.

Reforestation at the Fatima mining concession of the AMATAF mining association.

PERU

"We work hard to be an organization that fully understands the country and its regional realities. Our work is reinforced by the commitment and support of the community, industry, and political will that has resulted in meaningful collaborations to achieve a cleaner and healthier future for all. Our bet is on the future."

—RODRIGO VELARDE
Country Manager, Pure Earth Peru

KEY PARTNERS:

The Peruvian Ministry of Health's Center for Epidemiology, Prevention and Control of Diseases; General Direction of Mining Formalization (DGFM); Center for Amazonian Scientific Innovation (CINCIA); CITE Minería y Medio Ambiente; Alliance for Responsible Mining (ARM); Casa Collab; The Tiffany & Co. Foundation; Brilliant Earth; Vital Strategies; Madre de Dios Women's Network

Rapid Market Screening

Peru is one of 25 countries in the project, which seeks to identify sources of lead in consumer products sold in markets. **228 product samples from markets** across the country were collected and sent for analysis. The results show that products of concern include metal cookware and ceramic cookware, with 69% and 42% respectively, of the samples exceeding the reference values for lead.

Strengthening National Health System to Address Lead Poisoning

Peru is part of a global project that is taking place in five countries, focused on building capacity to implement an effective national action plan to prevent, identify, and treat lead poisoning. Funded by the global pharmaceutical leader Takeda, the project will strengthen Peru's national health system's ability to collect, store, and analyze childhood lead exposure data; provide training to improve local expertise, and

raise awareness through the dissemination of information about lead exposure. The project will enable the government to plan, advocate for, and enact sound, cost-effective policies to address root causes of lead poisoning.

Development of a Responsible Mining Model

In 2022/23, Pure Earth Peru worked to further fine-tune the responsible artisanal and small-scale Amazon gold mining model in order to expand and scale up its use around the world. The model is based on the use of clean and efficient technologies to eliminate the use of mercury and encourage the implementation of sustainable environmental practices, and the restoration of mining-degraded areas through reforestation as part of responsible mine closures. This process has the potential to improve the quality of life of the miners in Madre de Dios, Peru, by mitigating the environmental impacts to the Amazon, and making the region's mining sector part of the responsible national and international market. The success of the Pure Earth model is reflected in the growing number of miners interested in joining the movement to produce more responsible gold.

Green Mining Project to Establish the First Mercury-Free Gold Supply Chain from the Peruvian Amazon

One of Pure Earth Peru's most significant commitments has been to help restore a region of Peru that has been impacted by artisanal and small-scale mining. To address this, Pure Earth Peru launched the Green Mining project in 2022, with the aim to create the first mercury-free gold supply chain in the Peruvian Amazon, while supporting the restoration of Amazon

A mining without mercury workshop in session for artisanal and small-scale gold miners.

rainforest degraded by mining activities. Funded by Brilliant Earth, a global leader in ethically sourced fine jewelry, and implemented by Pure Earth Peru and the Alliance for Responsible Mining, the project has been training miners in Madre de Dios in mining without mercury techniques and in reforestation based on Pure Earth's responsible artisanal and small-scale gold mining model.

Under this project, **more than 50 miners working in four concessions have become the first to be Fairmined certified in the Peruvian Amazon**. In addition, they are expected to be certified to produce Fairmined Ecological gold by the end of 2024. This will set an important precedent. The miner's certification has the potential to greatly impact the development of a responsible mining community in Peru, while attracting the interest of national and international markets for responsibly-mined gold.

Women Miner's Network of Madre de Dios

As women are the key to change in many communities, Pure Earth Peru is supporting an initiative to increase female participation in the mining sector and promote equal rights,

opportunities, and benefits for both men and women to help them pursue sustainable livelihoods in mining.

Various stakeholders are working on this initiative to empower women, from finding gender-sensitive financial mechanisms to accessing mercury-free technologies and developing equal market routes in the gold supply chain.

Successful Reforestation Program

In February and March 2023, the Pure Earth Peru team and local miners **planted 5,418 seedlings from native species to restore 3.25 hectares of a closed mining concession**. This brings the total number of seedlings planted by the team since 2017 to 13,750, initiating a process of ecological restoration of **over 10 hectares of rainforest** in the Peruvian Amazon.

In addition to reforestation activities, Pure Earth Peru is carrying out monitoring activities for some species that have already been planted. From these species, seeds are collected that have grown in areas degraded by mining.

Over the years, the miners have remained steadfast in their commitment to learning reforestation methods from Pure Earth, and have even **planted 1.5 hectares of land themselves** in a self-directed effort.

To support this reforestation work, Pure Earth conducted a study in 2022 to estimate the effects of different deforestation and reforestation scenarios in the region of Madre de Dios where Pure Earth works with miners. Pure Earth researchers found that further deforestation could lead to the displacement of up to 20.16 mg of mercury per hectare into the watershed annually, whereas further reforestation could prevent up to 15.36 mg of mercury per hectare from reaching the watershed annually. The study highlights the importance of the Amazon rainforest in capturing and storing mercury that would otherwise make its way into bodies of water, where it could wind up in fish, then humans.

Raising Awareness

In May 2023, Pure Earth Peru's local coordinator, France Cabanillas, was invited by the University of Lausanne, Switzerland, to deliver a talk to an international workshop with participants from the mining sector, government entities, NGOs and universities from Brazil, Peru, Colombia, Ivory Coast, and more. Cabanillas discussed the challenges of facilitating the commercialization of gold, mined without mercury, from Madre de Dios, Peru, as well as the promotion of good practices in mining communities.

Cabanillas was also invited by the Dirección General de Formalización Minera (DGFM) and other governmental entities to provide training on the decontamination of alluvial deposits at a workshop for formal miners and miners in the process of formalization in the Madre de Dios region, on May 25 and 26.

Locally, a popular podcast in Madre de Dios reported on Pure Earth's impact in the local community through several stories featuring the voices of local experts and the miners themselves.

On the global level, the success of Pure Earth's work in Peru was highlighted in a front-page Earth Day report in *The Guardian* titled *Gold standard: Peru miners phase out mercury in bid to clean up industry*.

A Pure Earth investigator conducting a home-based assessment in the Philippines.

PHILIPPINES

"Pollution is such a complicated issue. For us at Pure Earth, the steps are clear: we gather as much data about the problem as possible; communicate the findings to stakeholders; co-plan and implement appropriate, science-based interventions; pioneer if we must, then document and share the challenges and best practices, and keep on doing so until critical policies and programs are integrated in governance towards sustainability."

—LARAH ORTEGA IBAÑEZ
Country Director, Pure Earth Philippines

KEY PARTNERS:

National Poison Management and Control Center (NPMCC); Philippine Department of Science and Technology's Food and Nutrition Research Institute (DOST FNRI); Vital Strategies; HSBC; Clarios Foundation

Rapid Market Screening

The Philippines is one of 25 countries taking part in the Rapid Market Screening program, which aims to identify products contaminated with lead that are sold in markets around the world. A total of **265 samples were collected and tested from 65 vendors in 7 markets** across the country's major geographical islands of Luzon, Visayas and Mindanao, revealing the presence of lead in metallic and ceramic foodware, cosmetics, toys and paint. The results were shared with the government's Food

and Drug Administration and during the first National Conference on Social Development and Sustainability.

Blood Lead Level Monitoring

In 2022, Pure Earth Philippines continued a national blood lead level (BLL) survey, launched in 2021 with Pure Earth's help, of **3,000 children ages six through nine and pregnant women in 25 areas** across the country. This was done in partnership with the Food and Nutrition Research Institute of the Department of Science and Technology. Results showed that the majority of the children had BLLs below the detection limit of 2 ug/dL, while **257 or 8.76% of the children in this study had BLLs above 3.5 ug/dL**.

Feedback forms in sealed envelopes were sent to all participants of the first 13 areas tested, detailing their results and offering either face-to-face or teleconsultations with toxicology doctors and fellows at the National Poison Control Management and Control Center of the University of The Philippines Manila, Philippine General Hospital. The same is being prepared for the additional 12 areas. This feedback is an important part of the BLL testing process to help increase awareness about lead sources and impacts at the household level, and provide guidance on how families can protect their children from further lead exposures. Participants have shared that they appreciated these followup services.

The BLL survey has produced crucial data that is attracting the attention of health officers from local government units interested in learning how they can do similar testing in their own localities and how to respond should there be detected cases of lead poisoning. It is also worth noting that **addressing lead exposures has been prioritized in at least ten of the strategic actionable items** in the latest National Environmental Health Action Plan (NEHAP) 2023–2030 of the country's Inter-agency Committee on Environmental Health chaired by the Department of Health and co-chaired by the Department of Environment and Natural Resources.

Home-based Assessments

Pure Earth investigators **visited 21 homes of BLL survey participants** in a pilot program to identify sources of lead exposure in households. The results from 18 of these homes revealed similar results as what was found in our Rapid Market Screening of products in Filipino markets: lead presence in 100% of aluminum cookware samples ranging from 13 to 3,626 ppm, 50% of ceramic food wares ranging from 11 to 17,000 ppm, 28% of the toys ranging from 6 to 1,692 ppm, and 22% of the paints ranging from 8 to 3,555 ppm.

Capacity Building

Pure Earth Philippines, with the technical assistance of Vital Strategies, has completed an assessment report covering the country's policy landscape and capacities in the following areas: public health surveillance, national laboratories, clinical management, and risk communication.

This report is the first step in helping Pure Earth and stakeholders support institutionalized interventions like the setting up of a monitoring and surveillance system for lead in pilot areas of the country, and the integration of lead poisoning management in the health system, for example, including BLL testing services in the universal health care package.

This follows Pure Earth's successful effort in helping the government incorporate the first-ever BLL testing into the country's Expanded National Nutrition Survey, which is conducted every three years.

EVENTS

left to right: Rachel Silverman Bonnifield, Senior Fellow, Center for Global Development; Paromita Hore, Director, Environmental Exposure Assessment and Education, New York City Department of Health and Mental Hygiene; Richard Fuller, Founder, Pure Earth; Lucia Coulter, Co-Founder and Co-Executive Director, Lead Exposure Elimination Project.

Dr. Gordon Binkhorst explains how to measure lead-contaminated products with an XRF (X-ray fluorescence) hand-held meter.

Pure Earth and the Center for Global Development Bring First Event Focused on Global Lead Poisoning to Washington, D.C.

On June 15, 2023, Pure Earth and the Center for Global Development jointly hosted *Get The Lead Out: A Day Connecting Local and Global Action for a World Free of Lead Poisoning.* The half-day event was the first to spotlight the issue of global lead poisoning, affecting 1 in 3 children worldwide, to decision makers in Washington D.C. The high interest level signaled a growing understanding of the far-reaching impacts lead poisoning has on health, society, and the economy, as well as a willingness to begin to address the issue.

Pure Earth participated on the panels, and staffed many of the learning stations at the event, sharing information about our latest research and resources, lead solutions, case studies and other progress we're making on the ground. The event was a rare opportunity for decision makers in the nation's capitol to connect with the leading experts working today on the issue of global lead poisoning. Participants included UNICEF, the U.S. Environmental Protection Agency, Centers for Disease Control, Lead Exposure Elimination Project, and the New York City Department of Health and Mental Hygiene.

A social media campaign for International Lead Poisoning and Prevention week in India drew millions of engagements.

A rally participant in Bangladesh.

International Lead Poisoning Prevention Week

Pure Earth once again mobilized forces for International Lead Poisoning Prevention Week, an awareness-raising campaign created by the World Health Organization that takes place every October. For 2022, Pure Earth offices around the world reached millions through social media campaigns, panel discussions, school visits, and many other events that were covered by news media.

In Bangladesh, hundreds of young students and activists rallied to form a human chain at the National Press Club to raise awareness and demand action on lead pollution. The team also organized film screenings and webinars.

In India, our activities drew broad media attention including a prime-time panel discussion with CNBC's Poddar Nisha on her show *Big Deal*, and reports with headlines such as *Lead Poisoning: Pure Earth Wants Us To Be Worried*, positioning Pure Earth prominently as leaders in the field. In addition, Pure Earth board member Tabassum Inamdar contributed a powerful opinion piece on LinkedIn titled *Lead Emission & Corporate Action*. A social media campaign reached over a million people by engaging them on the streets, on the beach, at work, in malls, and in villages.

In Mexico, the Pure Earth team reached a large audience with their #LeadSolutions Yo Soy #SoluciónAlPlomo campaign.

Globally, Pure Earth premiered *Films from the field*, a series of three shorts showing the impact of lead on a family, a community, and an entire country. These screenings were followed by discussions and Q&As with global experts, including **Dr. Howard Hu**, one of the leading experts in environmental health in the U.S.; Brian Wilson with the International Lead Association; and Dr. Paromita Hore, who leads an ongoing lead poisoning and exposure source identification program for the NYC Department of Health and Mental Hygiene. In addition, partner organization Vital Strategies hosted a podcast that posed the question "What If Childhood Lead Poisoning was a Global Priority?"

Award-winning WNBC reporter Sarah Wallace with Force of Nature honoree Alicia Ogawa.

International Women's Day: Force of Nature

Every year on International Women's Day on March 8, Pure Earth raises awareness about the profound impact that pollution has on maternal and child health by recognizing women working on solutions in government and policy making, private entrepreneurship, and community-level interventions.

The 2023 Force of Nature award was presented to **Dani Cutler**, marketing manager for Hoover & Strong and a leader in responsible sourcing in the jewelry industry; **Karen Mathiasen**, the Former Acting Executive Director, World Bank Group and Commissioner, The *Lancet* Commission on Pollution and Health; and **Alicia Ogawa**, a Pure Earth Board Member committed to encouraging companies and investors to include pollution in their ESG (Environmental, Social, and Governance) initiatives. Hosted by Emmy Award-winning WNBC Reporter **Sarah Wallace**, the 2023 program featured special appearances by U.S. Rep **Debbie Dingell**, and former U.S. EPA administrator **Carol Browner**.

Earth Day

To mark Earth Day 2023, experts from Pure Earth, Consumer Reports, NYC Department of Health and other experts took part in a special roundtable discussion and Q&A moderated by **Leslie Norton**, Editorial Director, Sustainability, Morningstar.

The online panel discussed what is being done in the U.S. and around the world to stop heavy metals from coming into kitchens, what levels of risk different contaminated products pose, and what we can do to protect families.

Actor/musician and environmentalist Ruby Rivera Modine was the face of the 2022 Pure Earth Pure Gold collection.

left to right: At the Pure Earth 2022 benefit: Pure Earth President Richard Fuller with Beth Gerstein, CEO, Brilliant Earth; Josh Mailman, Founder, Serious Change Investments; and Drew McCartor, Pure Earth Executive Director.

Pure Earth Benefit

The annual Pure Earth benefit and jewelry auction took place at the Edison Ballroom in NYC on October 17, 2022, honoring **Josh Mailman**, Founder of Serious Change Investments with the Green Benefactor award; and Brilliant Earth CEO **Beth Gerstein** with the Impact Award.

During the evening, benefit attendees got the opportunity to explore the 2022 Pure Earth Pure Gold collection up close and place their final bids. Featuring beautiful pieces of jewelry crafted by responsible jewelers, the collection featured, for the first time, only works using Fairmined certified gold. The benefit and auction, along with our generous sponsors, raised crucial funds to support Pure Earth's life-changing work.

left to right: Allison Charalambou, V.P., Responsible Sourcing + Sustainability at Brilliant Earth; Jen Marraccino, Pure Earth; Eric Laker, Founder/CEO Lashbrook; and Toby Pomeroy, Director, Mercury Free Mining Inc., at JCK Las Vegas in June 2023.

Pure Earth's Jen Marraccino with Bobby Guarnaccia, recipient of the 2023 Green Champion award.

Jewelry Industry Events Raise Awareness, Build Collaborations

In 2022, Pure Earth was part of a panel at the **Chicago Responsible Jewelry Conference**, with the Alliance for Responsible Mining and Peruvian jeweler **Andrea Jose Castro** from Casa Collab. The panel shared information about Pure Earth's work with miners, and encouraged other companies to follow Brilliant Earth Foundation's lead in funding projects in the field and educating consumers.

As part of 2022 **New York City Jewelry Week**, Pure Earth participated in *Reciprocity*, an event held at the Peruvian Consulate in New York, organized by Peruvian jewelry designer and Pure Earth supporter Andrea Jose Castro. Following a panel discussion about the commitment of responsible miners in Peru, event guests were invited to an exhibition of jewelry crafted by a group of ethical jewelers using gold produced by these miners. The event was covered in *El Comercio*, one of Peru's top news sources, highlighting the important connection between miners and jewelers.

On June 1, 2023, Pure Earth attended **JCK**, the world's largest jewelry industry trade event, joining industry leaders on a panel *Helping Miners Go Mercury Free 101*. The group discussed solutions using Pure Earth's project with Brilliant Earth as a case study, demonstrating how industry support for Pure Earth is helping to establish the first mercury-free gold supply chain in the Peruvian Amazon.

Pure Earth Golf Benefit

On June 5, 2023, golfers gathered at the famed Fenway Golf Club in New York, considered one of the best classical courses in the country, for the Pure Earth annual golf benefit. **Bobby Guarnaccia** from Royal Waste Services was presented with the 2023 Green Champion award for his unwavering dedication to supporting Pure Earth's vision and work. BMS (Building Maintenance Service) once again showed their support by being a Champion sponsor.

PRESS

HIGHLIGHTS INCLUDE:

1. Gold standard: Peru miners phase out mercury in bid to clean up industry, *The Guardian*, April 21, 2023
2. Want to stop worrying about heavy metals in baby food, dark chocolate and spices? Solve it at the source, *The Hill*, Feb 6, 2023
3. Element of Mystery: Half the children in India are poisoned by lead. Why has the country failed to prevent it despite knowing the sources and treatment?, *Down to Earth*, Jan 15, 2023
4. Peruvian gold jewelry triumphs at New York Jewelry Week, *El Comercio*, Nov 22, 2022
5. 'Stranger Things' star Matthew Modine joins daughter to support jewelry line to help protect the Amazon rainforest, *New York Daily News*, Sep 29, 2022
6. Pure Earth's 2022 Pure Gold Jewelry Auction is now open, *National Jeweler*, Oct 12, 2022
7. Human chain, rally held marking 'International Lead Poisoning Prevention Week', *The Business Standard*, Oct 23, 2022
8. Pure Earth tackles lead poisoning on Earth Day 2022, *Ghana News*, Apr 22, 2022
9. High exposure to lead hits children's ability to learn, *Financial Times*, July 30, 2023
10. Bangladeshi film gets WHO's Health for All Film Festival award, *Dhaka Tribune*, Jun 7, 2023
11. Lead Poisoning: Pure Earth wants us to be worried, *The Business Standard*, Oct 25, 2022
12. Lead pollution, Ghana's ticking time-bomb, *Joy Online*, March 23, 2023
13. Pottery exhibition inaugurated at the Morelense Museum of Popular Art, *El Sol de Cuernavaca*, March 19, 2023
14. The weight of gold Podcast, *RPP Noticias* podcast, May 3, 2023

PURE EARTH

475 Riverside Drive, Suite 860 / New York, NY 10115 / Tel 212 870 3490 www.pureearth.org

Above: Pure Earth Ghana team members with residents during a home-based assessment visit. Pure Earth investigators were working to identify possible sources of lead exposure in homes by testing products like cooking pots, which are sometimes contaminated with lead.