

LEAD Action NEWS

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The newsletter of The LEAD (Lead Education and Abatement Design) Group Inc.

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Model National Lead Safety Policy and 2023 Volcano Art Prize



The Volcano Art Prize Judge for 2023, Monika Maszkowska, has awarded the First Prize to two entries jointly: Haoze (Allen) Li, Age 11 (Turtle) and Jennifer Chua, Age 12 (Leaf):



And the other \$200 Cash Prize for the People's Choice Winner is: John Spencer Onyango for his popular on YouTube Anti-Lead in Paint Campaign video:





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Model National Lead Safety Policy

Illustrated by 2023 Volcano Art Prize Entries

LINKS

<https://leadsafeworld.com/directory>

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REFERENCES:

<https://leadsafeworld.com/references/>

DIRECTORY:

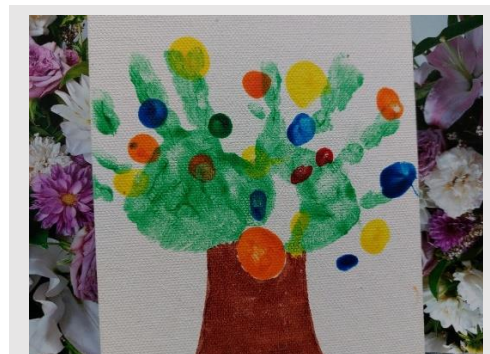
<https://leadsafeworld.com/directory>

SUMMARY:

<https://leadsafeworld.com/summary-natpol>

FULL DOCUMENT:

<https://leadsafeworld.com/fulldoc-natpol>



2023 Volcano Art Prize Entry. Artist:

Azalea Manttan

Title: My Life is in Your Hands

Lead-Safety Message: Please make the world lead-safe and climate-safe by the time I grow up.

Age: 18 months

Description of Work: Hand prints with non-toxic children's paint.

<https://volcanoartprize.com/portfolio-item/my-life-is-in-your-hands/>



Model National Lead Safety Policy Proposal: *Towards a Lead-Safe World*

The LEAD Group's Proposal for National Government Policy on the Prevention and Management of Lead Exposure, Poisoning and Contamination

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Michael Mobbs

Andrew Hobday

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The LEAD Group Inc., Australia; Lead Aware NZ (New Zealand); and LEAPP Alliance, UK – Lead Exposure and Lead Poisoning Prevention Alliance – A joint initiative of the Lead Containing Materials Association, Lead in Water and Lead Safe World UK (United Kingdom)

11th July 2023



2023 Volcano Art Prize Entry. Artist:

Claire Leight

Title: Grandma Lead in Kingaroy

Lead-Safety Message: Grandma Lead (Elizabeth O'Brien) is proud to be a kid from Kingaroy, a co-founder of The LEAD Group and co-writer of the world's only [Model National Lead Safety Policy Proposal – Towards a Lead-Safe World!](https://volcanoartprize.com/portfolio-item/grandma-lead-in-kingaroy/)

Description of Work: Photograph –
Iphone

<https://volcanoartprize.com/portfolio-item/grandma-lead-in-kingaroy/>



Model National Lead Safety Policy: Towards a Lead-Safe World

The LEAD Group's Proposal for National Government Policy on the Prevention and Management of Lead Exposure, Poisoning and Contamination

Lead is the most studied toxic substance because it is the most common pollutant of the industrial era.

By addressing historical lead contamination will provide a lead-safe world for future generations of all living things. Without lead dampening IQ, our ability to prevent the climate crisis and other existential threats is much greater.

Lead makes climate change worse and vice versa.



Rural communities feeling anxious as NSW government pursues Critical Minerals Strategy

ABC Central West / By Joanna Woodburn
Posted Wed 4 Oct 2023 at 3:27pm



Australia's beef, sheep and olive exports could be ruined if lead mine is built in New South Wales, inquiry told

ABC Central West / By Joanna Woodburn
Posted Wed 4 Oct 2023 at 3:27pm

Chair of NSW parliamentary inquiry into impacts of metal mining on human health flags integrity concerns

ABC Central West / By Joanna Woodburn
Posted Fri 15 Sep 2023 at 9:28am

NSW parliamentary inquiry submissions warn of lead, gold, silver, zinc mining impacts

ABC Central West / By Joanna Woodburn
Posted Fri 15 Sep 2023 at 9:28am



2023 Volcano Art Prize Entry. Artist: The LEAD Group

Title: Orange Mudgee Mine News

Lead-Safety Message: ABC News reporters Joanna Woodburn and Micaela Hambrett have done an awesome job in 2023 reporting on acid mine drainage from the former Sunny Corner mine, and lead contamination and potential future lead hazards from Cadia Lead Mine near Orange and the proposed Bowdens Silver Mine at Mudgee.

Description of Work: Collaged screenshots from [Australia's beef, sheep and olive exports could be ruined if lead mine is built in New South Wales, inquiry told - ABC News](#); [Rural communities feeling anxious as NSW government pursues Critical Minerals Strategy - ABC News](#); [Chair of NSW parliamentary inquiry into impacts of metal mining on human health flags integrity concerns - ABC News](#); [NSW parliamentary inquiry submissions warn of lead, gold, silver, zinc mining impacts - ABC News](#)

<https://volcanoartprize.com/portfolio-item/orange-mudgee-mine-news/>

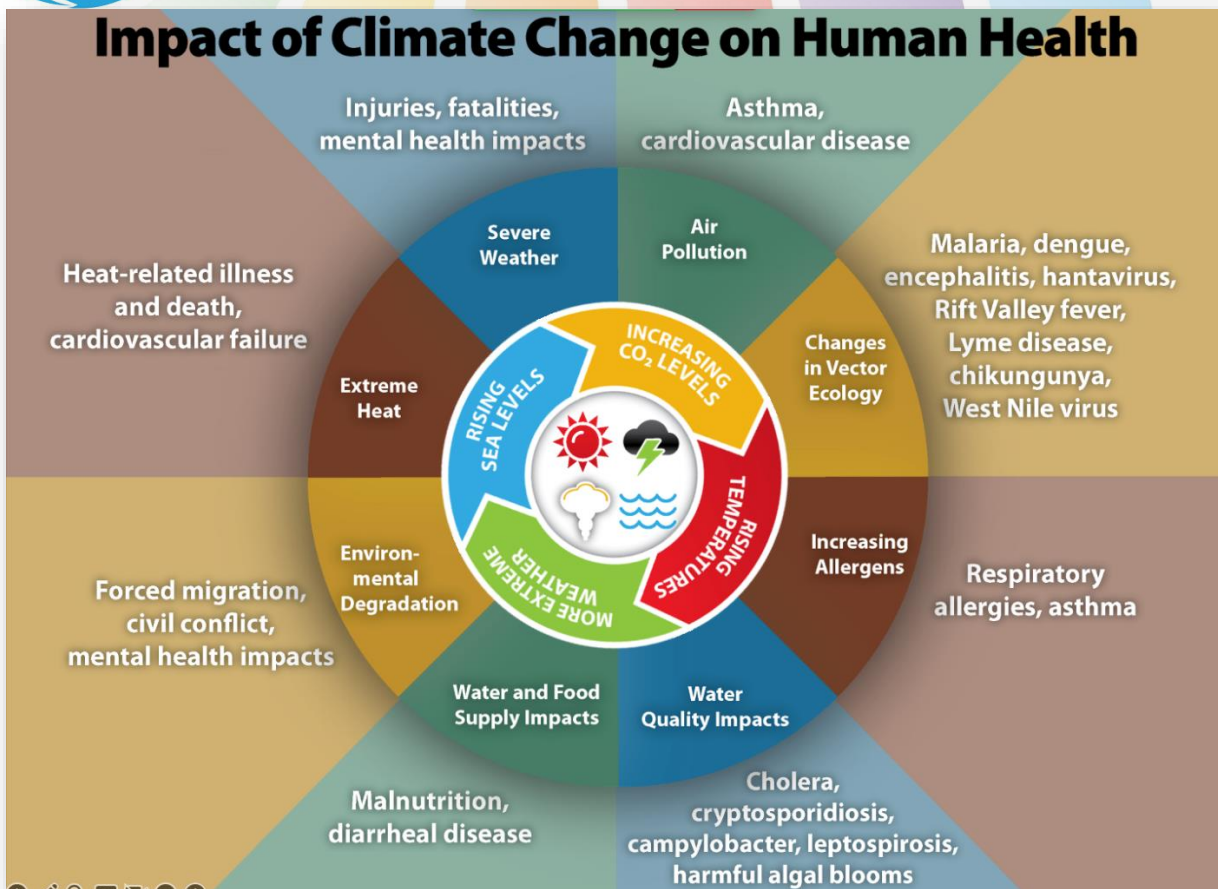


Figure 1: *Impact of Climate Change on Human Health* (CDC 2022a)

In this Figure, lead interacts with climate change impacts in the following ways:

- Due to its natural occurrence in soil, rocks and volcanic emissions, lead contaminates all fossil fuels, thus the burning fossil fuels (which raises CO₂ levels) releases lead into the air which settles in dust, soil, water and sediment (see xiv, below).
- Higher temperatures will increase the acute effects of lead poisoning, known as the “summer disease”, (as discussed below, in this section).
- Extreme weather results in more powerful and more frequent floods, fires, droughts and dust storms all of which can mobilise lead from roofs and roads and transport more of it to rivers and oceans, dust, soil and sediment. From there lead (and other contaminants) get into the food and water supply chains for human, marine and land life.



2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Burnt Baobab Trees

Lead-Safety Message: When bushfires or wildfires burn trees, lead is released in the smoke and ash. We need to avert climate crisis!

School: Creative Einstein

Age: 10

Description of Work: Lead (graphite) pencil on paper.

<https://volcanoartprize.com/portfolio-item/burnt-baobab-trees/>



- Rising sea levels carry coastal lead contamination further inland.
- Climate change-related health impacts are all worsened by lead exposure, including:
 - Cardiovascular death is the most common result of lead poisoning
 - Infectious diseases and allergies (lead affects the immune system)
 - Lead contaminated water affects all ages, unlike dust and soil, which affects mostly children
 - Malnourished individuals absorb lead more readily
 - Lead impacts mental health and causes aggression, violence, delinquent behaviours making life worse for climate refugees who are forced into migration or civil conflict

Since the 1960s, links have been made between hot weather and lead poisoning. Australian research revealed an increased number of hospital admissions for childhood lead poisoning during summer ([Freeman 1969, 1970](#)).

Seasonal Incidence: Most of the children, and in particular those with acute encephalopathy, presented in the hot summer months, December to February, but cases occurred throughout the year, often precipitated by an intercurrent infection. Children with moderately severe poisoning may seem well during the winter months, but tend to develop symptoms during the hot summer period. The reason for this is not clear. Solar radiation, which increases the synthesis of vitamin D in the skin, may aid absorption of lead, and factors causing dehydration or acidosis, which like infections mobilize lead from the bones, may be more common in the hot weather. ([Freeman 1970](#)).

Summer disease doesn't only affect children. In 2009 in Esperance, WA, over 9,000 nectar-eating birds died of lead poisoning mostly on the hottest days that summer. This was due to lead ore dust which escaped from open conveyor belts loading onto open hull ships. At the LEAD Group, we receive numerous calls from people who are lead poisoned, some of their stories have been:

- A firearms instructor was "very short-tempered" and when he worked in poorly ventilated indoor ranges he reported having violent mood swings. He said that when working outside in the sun, he knew he's going to get a "lead dump" – experiencing symptoms like hot flushes, breaking out into a sweat and feeling like he was "spontaneously combusting from inside". After work, he'd experience short term memory loss and get a metallic taste in his mouth.



2023 Volcano Art Prize Entry. Artist: Rohan Calvert

Title: MIW Lead Safe Rooftop Remediation

Lead-Safety Message: Men in White (MIW) does lead-safe paint remediation in inner and eastern Sydney. Before photo on left, after on right. Rainwater collection area was also remediated to ensure no detectable lead in drinking water from back roof.

Description of Work: iPhone photos.

<https://volcanoartprize.com/portfolio-item/miw-lead-safe-rooftop-remediation/>



- An old English sheepdog who had become lead poisoned from chewing old painted furniture, would have fits when he got hot.

The countries that don't prioritise lead exposure and lead poisoning prevention will be left behind.

Lead is the highest priority paediatric health problem in the United States because of the cost of dealing with the long-term effects and the massive return on investment of lead abatement and lead exposure prevention.

A study "Half of US population exposed to adverse lead levels in early childhood" ([McFarland et al 2022](#)) estimated that in the US alone, over 824 million IQ points were lost during the 100-year era of leaded gasoline use.

Typical human lead exposure in ancient times has been estimated by [Flegal and Smith \(1992\)](#) to be 0.016 micrograms per decilitre ($\mu\text{g}/\text{dL}$), as represented by the single dot on the first body in Figure 2, below.

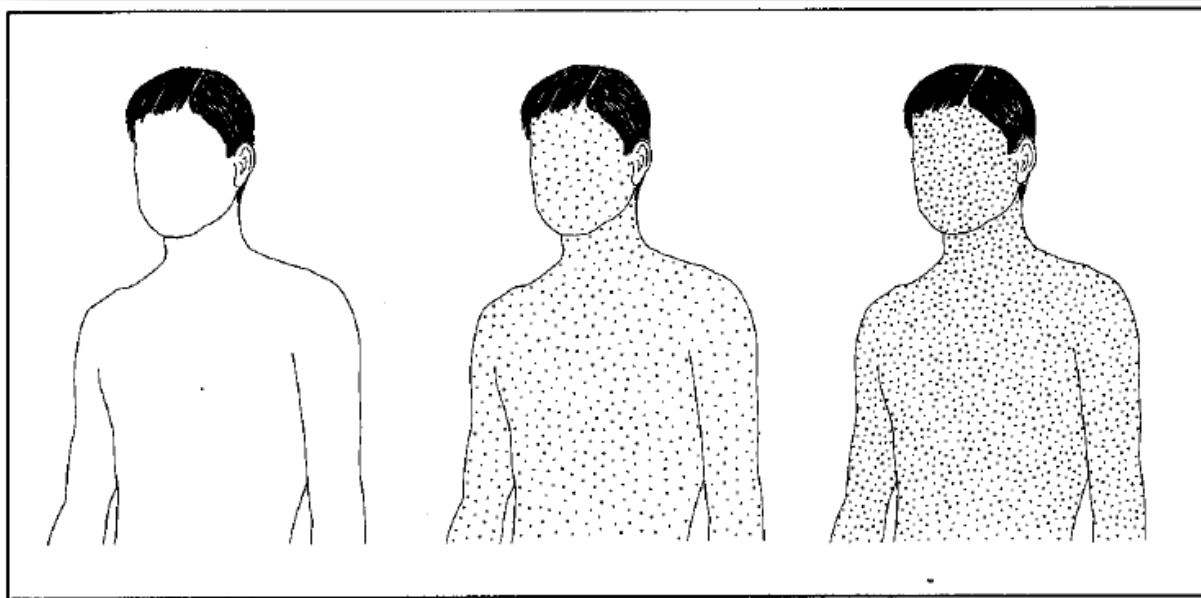


Figure 2. Body burdens of lead in ancient people uncontaminated by industrial lead (left); typical Americans (middle); people with overt clinical lead poisoning (right). Each dot represents 40 μg of lead. Source: Patterson et al, 1991; adapted from NRC, 1980. (NRC 1993, Figure 1-1, page 15) (Figure and caption reprinted with permission from *Measuring Lead Exposure in Infants, Children, and Other Sensitive Populations*, 1993, by the National Academy of Sciences, Courtesy of the National Academies Press, Washington, D.C.)

Lead is a heavy metal that is neurotoxic and negatively impacts learning behaviours and every organ in the body. It is mainly stored in the bones and teeth (which begin to develop in the first trimester) and can be released back into circulation for many reasons, including certain triggers, like pregnancy and lactation (thus posing a risk to the next generation even after successful public health measures have reduced current exposure), and menopause; as the bones begin to demineralise during ageing; and when the individual is exposed to increased temperatures. Australian researcher, Manish Arora and his team established that



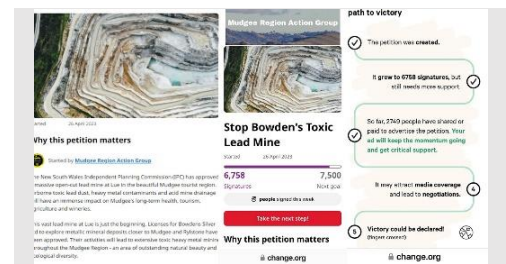
“In ASD [Autism Spectrum Disorder] cases, higher [yet still relatively low] lead levels were observed over the prenatal period and first 5 months postnatally” in the lost baby teeth of Swedish children diagnosed with ASD compared to their non-ASD twin ([Arora et al 2017](#)).

“Persistent bioaccumulative toxic chemicals (PBTs) [such as lead] are of particular concern because they remain in the environment for significant periods of time and concentrate in the organisms exposed to them” ([US EPA 2022](#)).

Human-generated lead pollution from all sources can contaminate air, land, waters and sediments and poses an exposure risk to all living organisms.

Leaded petrol/gasoline and the consequent lead exposure of every organism on earth has rightly been described as *the* mistake of the twentieth century.

Lead in air continues to be a problem in urban areas due to the continued use of leaded AvGas, diesel and unleaded petrol, burning of fossil fuels and the past use of leaded petrol/gasoline, and this is due to re-entrained road dust, exhaust from old lead-petrol-using vehicles ([BBC & Edwards 2021](#), [Resongles et al 2021](#), [Gioia et al 2017](#)). Air lead pollution aside, the global elimination of leaded petrol ([O'Brien 2021](#)) does not on its own stop lead from petrol from reducing IQ and shortening longevity.



2023 Volcano Art Prize Entry. Artist: Mudgee Region Action Group
 Title: Stop Bowdens Toxic Lead Mine
 Lead-Safety Message: It's time for you dear readers to take action and sign the petition at

<https://www.change.org/p/help-stop-bowden-s-toxic-lead-mine>! This could be the first of many lead mine and lead mine expansions to be stopped by wonderful people like you who are creating a lead-safe world for our children!
 Description of Work: Screenshots from [Petition - Stop Bowden's Toxic Lead Mine - Change.org](#) collaged together in Powerpoint.

<https://volcanoartprize.com/portfolio-item/stop-bowdens-toxic-lead-mine/>

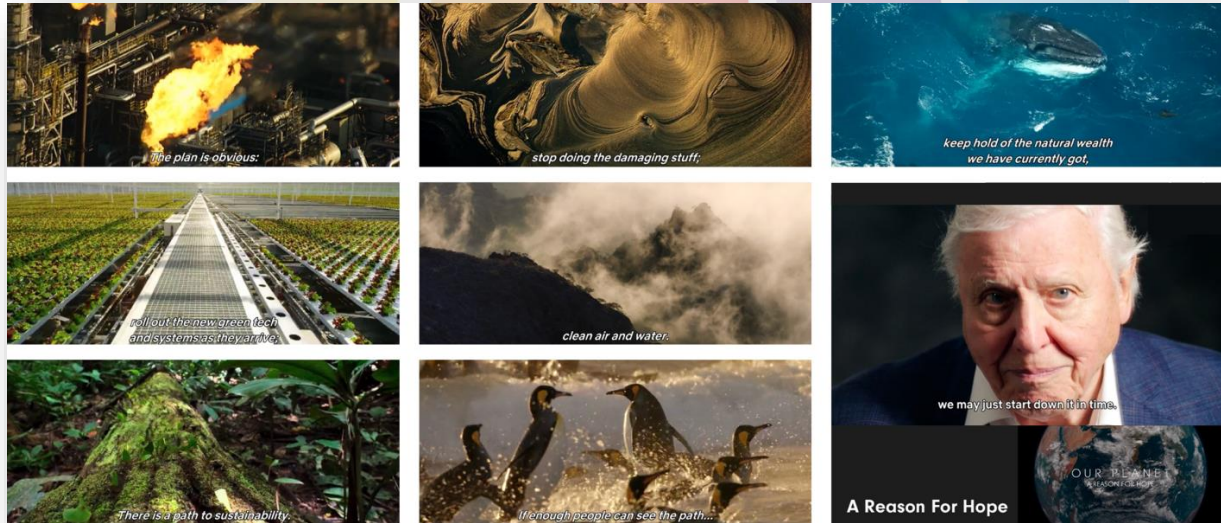


Figure 3. As David Attenborough says, “The plan is obvious: stop doing the damaging stuff...” ([Attenborough 2019](#)) [Video screenshots collaged by Lucinda Curran and Elizabeth O'Brien]

Those two huge impacts on Global GDP and health will continue until petrol-lead contaminated dusts, soils, waters, sediments, and waste dumps are also cleaned up. Lead contaminated materials generated in cleaning up the world, could be disposed of as fill, in closed-down or mined out pits of heavy metal and fossil fuel mines (see xvi, below).

According to [Dr Valerie Hickey \(2023\)](#), of the World Bank: [UNICEF \[2020\]](#) and Pure Earth [July 2020] estimate that 1 in 3 children – or up to 800 million globally – have blood lead levels at or above 5 micrograms per deciliter [$\mu\text{g}/\text{dL}$] when any lead disrupts a child's neurological development and can cause premature death” (02 February 2023). Further to this, “it was estimated in 2013 that a blood lead level of 1.0 $\mu\text{g}/\text{dL}$ was associated with a one-point loss in IQ score, confirming that there is no lower safe threshold of exposure” ([Taylor and Lanphear 2020](#)).

Lead is the most widely researched toxicant. [The US National Toxicology Program \(NTP\) \(2012\)](#) monograph, *Health Effects of Low-Level Lead* is a summary of recent research and is over 1000 pages long. Yet, since 2012, associations between lead and the following health or behavioural impacts have been unearthed through research:



2023 Volcano Art Prize Entry. Artist: Rohan Calvert
 Title: MIW Lead Safe Sign Remediation
 Lead-Safety Message: Men in White (MIW) is an award-winning painting service in inner and eastern Sydney. Before photo on left, after on right. The *Town and Country Illustrated Newspaper* exterior wall sign was uncovered during renovations and made lead-safe to become a feature interior wall.
 Description of Work: iPhone photos.

<https://volcanoartprize.com/portfolio/o-item/miw-lead-safe-sign-remediation/>



- Preeclampsia
- Pre-term birth
- Low birth weight
- Cataracts

([Vella et al 2020](#), [Roberts et al 2020](#))

Because lead exposure is so prevalent and lead is mainly stored in bones in place of calcium, virtually all pregnant women will experience a rise in their blood lead level during pregnancy as the foetus attempts to draw calcium from the bones. Even maternal blood lead levels below 1 µg/dL will decrease birth weight and gestational age in the same way that smoking during pregnancy does and “a 0.1 µg/dL increase in second trimester lead [is] associated with lower birth weight and pre-term birth” ([Rabito et al 2014](#)).

From the statistics that are emerging on health effects associated with lead exposure, clearly everyone has been affected by lead to some degree even though the vast majority of people are never tested or diagnosed. This silent global pandemic of lead poisoning stops virtually everyone from reaching their full cognitive and longevity potentials, and speeds brain ageing.

The World Health Organisation (WHO) reported in [Childhood Lead Poisoning](#) in 2010 that every dollar spent on preventing lead exposure returns between US\$17-220 in benefits. Put another way, every dollar spent on lead safety will be repaid 17-220 times in saved medical and educational costs, reduced crime and improved lifetime earnings. “This cost-benefit ratio is better than for vaccines, which have long been described as the single most cost-beneficial medical or public health intervention” ([WHO 2010](#)).

The United Nations ([Tsai and Hatfield 2011](#)) reported on the longer term benefits to governments of increased lifetime earnings of those who are not lead poisoned, and the resultant increase in revenue raised through income tax. In this report [Tsai and Hatfield \(2011\)](#) estimated a global annual benefit of US\$2.45 trillion (4.27% of global GDP per annum) due **only** to the phaseout of leaded petrol/gasoline (see xiv, below).

Cost-benefit analyses demonstrate substantial returns on investment into lead abatement, and lead poisoning and contamination prevention and management.



2023 Volcano Art Prize Entry. Artist: Joshua Fatsea

Title: Keep Red Eyed Tree Frogs Lead Safe.

Lead-Safety Message: They are threatened due to habitat destruction and degradation as they are particularly sensitive to pollution and climate

change. Stop burning their Central American rainforests to grow beef!

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio-item/keep-red-eyed-tree-frogs->



More recently, “participants of G7 members recognised that according to the World Bank’s most recent assessment, the global cost of the health effects of lead exposure is estimated to be 4.6% of global GDP” ([G7 Environment Ministers 2022](#)) (see Addendum 5, below).

Wherever this Model National Policy calls for research to be funded by government, it assumes that the government will also encourage philanthropic funding of said research.

It is beyond the scope of this Model National Lead Safety Policy Proposal to thoroughly detail proper protection of wildlife and the environment from lead. This is a human health focused policy and there are significantly more environmental impacts apply than what have been included here. Although, for instance, banning leaded ammunition (see 1.4, below) to protect shooters from lead exposure will also protect wildlife and the environment, and legislation that will result in protecting the environment from lead is specifically proposed (see xvi, below).

Initial Steps to Prevent Lead Exposure and Lead Poisoning

There is a clear role in global and regional lead-safety policy development, and guidance in development of national lead-safety policy for bodies such as the World Bank, the World Health Organisation (WHO), United Nations Environment Programme, and the World Medical Association (WMA), WHO Regional Offices, and for multilateral bodies such as the G7, and the OECD. The US government has a special role to play in assisting national governments to develop lead-safety policy because of their history of creating lead laws and consequently significantly reducing blood lead levels since 1970, see Figure 4 (below).



2023 Volcano Art Prize Entry. Artist: Edison Nguyen

Title: Cherries

Lead-Safety Message: Grapes grown on a trellis and tree fruits like cherries generally don't uptake lead from the soil, but dust or soil that gets on the fruit should be washed off before using. Eating cherries is way better than interacting with lead!

School: Creative Einstein

Age: 11

Description of Work: Colouring pencils on paper

[https://volcanoartprize.com/portfolio-item/cherries-](https://volcanoartprize.com/portfolio-item/cherries-2/)

[2/](#)

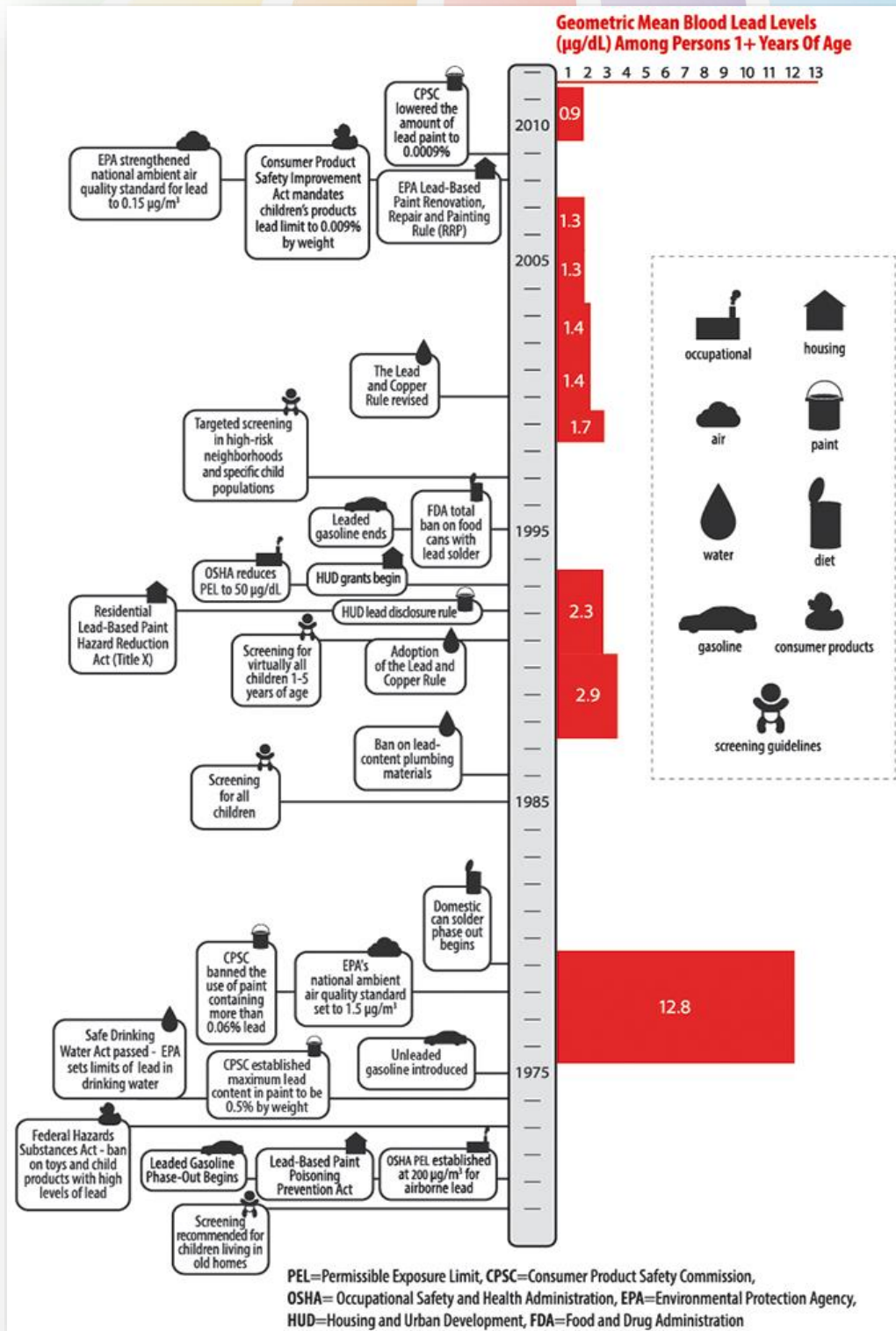


Figure 4: Selected Lead Control Measures, United States, 1970-2012 ([Dignam et al 2019](#))

The initial step in any national lead policy is to require that all of the following, and more, have a role to play.



Prime Ministers and Opposition Leaders, Ministers and Shadow Ministers, including but not limited to:

- Ageing and Health
- Agriculture
- Alcohol, Drug and Gaming
- Aviation
- Building, Construction and Demolition
- Child Poverty Reduction
- Children and Youth
- Climate Change
- Commerce and Consumer Affairs
- Consumer Protection
- Defence
- Economic and Regional Development
- Education
- Environment, Water and Conservation
- Fair Trading
- Fisheries
- Housing
- Indigenous Peoples
- Industry
- International Trade and Export Growth
- Justice and Corrections
- Marine Environments
- Medical Research
- Mining and Manufacturing
- Police
- Revenue
- Science and Innovation
- Shooters and Hunters
- Social and Gender Equity
- Social, Environmental and Intergenerational Justice
- Telecommunications
- The Arts
- Transport
- Workplace Relations and Safety



2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Christmas Decorations and Candles

Lead-Safety Message: Be sure to only buy lead-free Christmas decorations and non-metal-wick candles. The LEAD Group got lead candle wicks banned in Australia but not globally yet.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio-item/christmas-decorations-and-candles/>



i) Establish a National Blood Lead Surveillance System, the data from which feeds government Lead Education and Awareness Campaigns

A National Blood Lead Surveillance System is a database into which pathology laboratories and/or health professionals/agencies are required to enter blood lead results and associated data. It is designed to aid government, health professionals and researchers to see trends and make decisions on lead safety policy and lead exposure and poisoning prevention research.

If a National Blood Lead Surveillance System is not already in place, the national government's first responsibility in Primary and Secondary Lead Exposure Prevention, and Tertiary Lead Poisoning Prevention, is to set up such a Surveillance System to collect ALL blood lead testing results (not just those results which exceed the target blood lead limit at any one time). This surveillance will include active blood lead screening of individuals (and communities) identified through lead risk questionnaire screening, not just passive reporting of those cases identified by health care professionals.

Then to collate, analyse, and raise awareness of the conclusions of the analysis of the collected data.

Data collected for the National Blood Lead Surveillance System and entered by the pathology laboratory to include:

- Name
- Address
- National health identifier (such as Medicare/NIH, patient number, NHS number)
- Date and time of day of blood draw
- Time of day
- Date of birth
- Gender
- Ethnicity and/or race
- Blood lead result
- COVID-19 incidence (in the patient)

The doctor and/or local health agency is also required to enter data pertaining to interventions taken to reduce blood lead levels, and any information gleaned from particular case histories as to the sources of lead exposure in the individual/community, as stated below at v. As the National Blood Lead Surveillance System gains more data, an inventory of sources of lead exposure in the population (see Addendum 5, below) and a list of successful interventions will be generated.



2023 Volcano Art Prize Entry. Artist: Tim Pye
Title: Peebee The Elephant
Lead-Safety Message: Lead: The big, grey, dangerous, heavy element in the room. It could be your room.
Description of Work: Microsoft Powerpoint

<https://volcanoartprize.com/portfolio-item/peebee-the-elephant/>



Excellent examples of collation and analysis of blood lead data can be seen at the US Centers for Disease Control and Prevention ([CDC 2019](#)) website in the National Health and Nutrition Examination Survey (NHANES) ([CDC 2021](#)) Healthy Homes and Lead Poisoning Surveillance System (HHLPPSS) and summary data is included in the *National Report on Human Exposure to Environmental Chemicals* ([CDC 2022b](#)). CDC have also written and published over 100 lead poisoning case histories and meta-analyses in *Morbidity and Mortality Weekly Report* (MMWR) ([CDC 2023](#)) some examples are:

- [Elevated Blood Lead Levels Associated with Retained Bullet Fragments United States, 2003–2012 \(Weiss et al 2017\)](#)
- [Lead in Spices, Herbal Remedies, and Ceremonial Powders Sampled from Home Investigations for Children with Elevated Blood Lead Levels — North Carolina, 2011–2018 \(Angelon-Gaetz et al 2018\)](#)
- [Elevated Blood Lead Levels Among Employed Adults — United States, 1994–2013 \(Alarcon 2016\)](#)

ii) Set national blood lead action levels for sub-populations and the environmental and



2023 Volcano Art Prize Entry. Artist: Elizabeth O'Brien
Title: Invest Sustainably

Lead Safety Message: In *A Life on our Planet* (2020), my hero David Attenborough's vision of humans cooperating to achieve the rewilding of the world and avert climate disaster includes encouraging every individual to ensure their wealth is invested sustainably. If your bank or super fund isn't aiming to help end climate change, commit today to switch to one that does!

Description of Work: Powerpoint collage of screenshots from [Future Super and Pension Funds](#); [Count Us In website - Make Your Money Count commitment page](#); [Teachers Mutual Bank \(TMB\)](#); [Bank Australia](#); [A Life on our Planet \(Audible book\)](#)

<https://volcanoartprize.com/portfolio-item/invest-sustainably/>



consumer standards designed to lower blood lead levels, and to prevent and address environmental lead contamination

Blood lead testing is the gold standard for biomonitoring to assess recent exposure to lead. Repeated blood lead monitoring provides invaluable information as to lead exposure over time. Blood lead testing is also a useful tool in gauging the impact of actions intended to reduce the blood lead level as well as tracking the biokinetics of lead, that is, to assess how much lead from the bone (and other organ) stores has moved back into the bloodstream either due to treatment, extreme changes in activity levels (for example, becoming bedridden, or training for a marathon), hormonal changes such as during growth and pregnancy, or the demineralisation of the bones.

A blood lead action level is the level at which the government requires action to assist the blood lead level of the individual from a certain sub-population or leaded community to fall as quickly as possible below that level (see also 2.3, below).

*Because research into the health effects of lead has demonstrated over many decades that the action level will always need to be lowered further on the basis of the findings of ongoing health effects research, it is vital to **acknowledge** that the blood lead action level/s set by any government will be chosen on political and economic grounds. On health grounds alone, there is no threshold of safety in lead exposure, but less lead means less damage.*

It is irresponsible for a government to set the level/s very low in a country which has no hope of achieving it, especially if it still permits the addition of lead to paint, and the use of Ayurvedic medicines containing metal bhasmas, leaded AvGas for general aviation aircraft, the use of human sewage on food crops, etcetera - and even more irresponsible to set the level very high.

We have seen that what was considered to be an elevated blood lead level is NOT fixed. Initially, below 80 µg/dL was the "acceptable level" and this was progressively reduced (to 60, 50, 40, 25, 10, 5 and most recently 3.5 µg/dL) in the light of research revealing connections between blood lead levels and serious health risks. In [2009, WHO](#) wrote, "The ideal exposure level for lead is less than 1 µg/dl". Many of the world's leading lead researchers have since recommended lead levels of no greater than 1 µg/dL of blood as the action level.

In Germany, the [Wilhelm et al \(2010\)](#) policy paper written on behalf of the Human Biomonitoring Commission of the German Federal Environment



2023 Volcano Art Prize Entry. Artist: Jennifer Chuah

Title: Pearl Oyster

Lead-Safety Message: Pearls are made by oysters around a parasite that enters their shell. Lead is similarly encased in our bones but sadly can leach back into our blood stream later in life and cause early death.

School: Creative Einstein

Age: 12

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/pearl-oyster/>



Agency set a global precedent in lead policy by replacing health-based blood lead levels of concern with individual action levels (called "reference values") which differ for each sub-population, and were based on the 95th percentile blood lead result in a blood lead survey for that sub-population.

This meant that because 95% of German children (3–14 years of age) in the survey had a blood lead result below 3.5 µg/dL, the reference value became 3.5 µg/dL. Interventions were required from doctors and public health professionals for all child blood lead results 3.5 µg/dL and above.

The reference values for adults ([Schulz et al 2007](#)), which are based on data from the German Environmental Survey of 1998, are:

- Men 9 µg/dL
- Women 7 µg/dL

In 2012, the US CDC followed suit by choosing the 97.5 percentile reference value for children up to 72 months. Due to the NHANES ongoing national blood lead survey data, the 97.5 percentile reference value for children was further lowered to 3.5 µg/dL in 2021 ([CDC 2022c](#)).

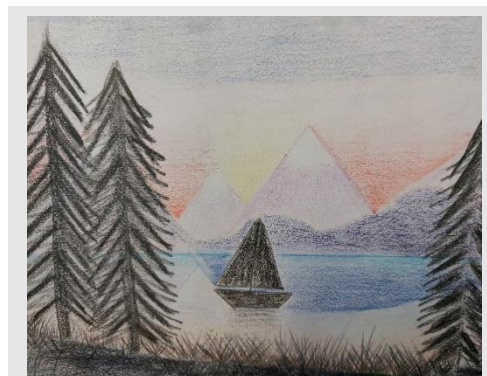
As at early 2023, the widely used action level is a blood lead level no greater than 3.5 µg/dL, based on US NHANES blood lead national survey data from 2011-2014 which determined that 97.5% of young children in the US had a blood lead level below 3.5 µg/dL. The CDC policy is to reduce this "reference" [or action] blood lead level each four years, in line with the NHANES survey (repeated every two years) falling 97.5th percentile result ([Caldwell et al 2017](#)).

The combination of the US model of lowering the reference level periodically and the German model of having reference levels for sub-populations, provides the best existing model for other nations.

In 2012, as a result of a forum held by members of The LEAD Group's Technical Advisory Board and others (including Professor Bruce Lanphear) ([Taylor et al 2012](#)), The LEAD Group set its action blood lead level to be 1 µg/dL.

The LEAD Group proposes that blood lead action levels be set and periodically lowered, and intervention actions determined by sub-population, including:

- Birth cord blood lead levels
- Children up to the age of 60 months
- Children 5-12 years old
- Children 13-20 years old



2023 Volcano Art Prize Entry. Artist: Joshua Fatsea

Title: Mountain Lake

Lead-Safety Message: Protect our beautiful planet by banning lead in aviation fuel, fishing sinkers, bullets, paint and everything else that causes lead pollution!

School: Creative Einstein, Age: 10

<https://volcanoartprize.com/portfolio-item/mountain-lake/>



- Adults 21-60 years old
- Adults 61-70 years old
- Adults 71-80 years old
- Adults 81-90 years old
- Adults 91-100 years old
- Adults over 100 years old
- Occupationally exposed sub-groups, for example, ship-breakers, gold assayers, metal and bone *bhasma* makers, plumbers, mine and smelters workers working with lead and lead-containing ores (zinc, copper, tin, silver or gold), fossil fuel burning facility workers, lead-acid battery manufacturing and recycling plant workers, vehicle recycling plant workers, painting contractors, remediators and restorers, shooters, leadlighters
- Community members by age sub-population in highly leaded communities
- Wildlife (aquatic and terrestrial)
- Domestic animals
- Farm animals (aquatic and terrestrial)

Occupational lead health and safety regulations will be updated to set more stringent blood lead action levels (for instance, removal from lead-risk work and return levels) by occupation. Enforcement of these up-to-date lead workers' regulations is an essential component of Primary Lead Exposure Prevention. Policing of occupational lead health and safety regulations is vital and enforcement must include financial penalties for non-compliance.

Occupational lead health and safety regulations will be set based upon the percentile blood lead level determined by government for that particular occupation and regularly reduced through continuous surveying, implementation of the Hierarchy of Control for Managing Risk of Materials (the highest level of control is to eliminate lead from the process), and resultant reduction in blood lead levels.

When products or processes which cause occupational lead exposure have been identified, policy on producer responsibility will protect the environment from lead and further decrease lead exposure in industrial scale, backyard, black-market and hobby lead processes, such as in the collection and recycling of used lead-acid batteries (ULABs)



2023 Volcano Art Prize Entry. Artist: Jordan Ma

Title: Frog on Grass

Lead-Safety Message: Many frogs are endangered. Make the world lead-safe so frogs can be safe too!

School: Creative Einstein

Age: 7

Description of Work: Colouring Pencils on paper

<https://volcanoartprize.com/portfolio-item/frog-on-grass/>



(see xvii, below), spent leaded ammunition and the management of lead paint (see also 1.6, below).

iii) Set target blood lead levels and reduce them over time

A target blood lead level is the blood lead level to be achieved by everyone who has a blood lead test in the entire population or a sub-population by a certain date.

The decision to not include adults in public health policy on lead poisoning prevention was a common mistake of past programs based on inadequate information about health effects of lead exposure in adults.

It is important to **acknowledge** that, if, in current regulations, a certain group of people, such as workers, are permitted to exceed the national target blood lead level, that this was a political and economic decision (often based on industry-funded misinformation) made in the past (or at best, one made in ignorance), not a health-based decision.

Australian, New Zealand and United Kingdom governments need to consider political and economic factors in order to determine staged reductions of the target levels set out below:

- All lead workers blood lead levels to be below 12 µg/dL by 2024,
- All adults, children and cord blood lead levels to be below 10 µg/dL by 2025,
- All children under 6 years of age and cord blood lead levels to be below 3.5 µg/dL by 2027,
- All adults, children and cord blood lead levels to be below 5 µg/dL by 2028, and
- All adults, children and cord blood lead levels to be below 1 µg/dL by 2031.

Each country's government will have to decide on what is politically and economically viable, but stepped targets will enable the development of specific strategies so that lead safety can be achieved over a set timeframe.

Any province, state or other level of government (which for instance is dependent on the income of a large lead facility) within the country, can set its own target blood lead levels, as long as the economic



2023 Volcano Art Prize Entry. Artist: Shitemi Owen

Title: Anti Lead in Paint Campaign Cake

Lead-Safety Message: This cake symbolises the successful work of University of Nairobi Chemistry Students Association and Basco Paints of raising lead poisoning awareness and introducing lead-free paints to Kenya.

School: University of Nairobi

Description of Work: The cake has logos of the sponsors of International Lead Poisoning Prevention Week of Action (ILPPWA) 2022 that included the

University of Nairobi, University of Nairobi Chemistry Students Association

and Basco Paints. It was 10 years anniversary icon from World Health Organization and a symbol of Ban Lead Paints.

<https://volcanoartprize.com/portfolio-item/anti-lead-in-paint-campaign-cake/>



and political factors for choosing the targets are acknowledged.

Define "success" in achieving a particular target as being no incidence of a blood lead level exceeding the target level by the target date, as revealed by follow-up national surveys and blood lead surveillance data. By setting both targets for blood lead levels and of zero incidence of cases above the sub-population's blood lead target, a country has something by which to measure its progress in reducing the incidence of lead poisoning in its national or regional population or sub-population. The blood lead monitoring data is vital for re-evaluating the strategies needed to meet the targets (see 2.3, below).

Conduct follow-up national, lead-town and leaded community blood lead surveys to see if the blood lead target was met and to motivate and inform increased development or implementation of programs to achieve the next target. Just as with blood lead target of individuals, the formula is:

- Survey
- Respond
- Re-survey
- Respond afresh
- Repeat until lead-safety is achieved

iv) Promote blood lead testing of individuals and inclusion in blood lead surveys of categories of people at risk of historical, current or future lead exposure

It is vitally important to identify individuals and populations at risk of historical, current or future lead exposure and ensure that they receive access to blood lead testing as soon as they have been identified and that they are informed of the results.

Targets will be set for the screening of at-risk sub-populations will ensure that blood lead testing is adequate. In the US, the target is that 100% of young children are screened via questionnaire and that 50% of children below 2 years of age are screened via blood lead testing. In Australia, the target is that 100% of lead-exposed workers are blood lead tested.

Once the National Lead Policy is finalised and adopted, the first round of media activity to raise awareness of the new policy will publicise the list of categories of individuals at risk of lead exposure and advise them to seek medical advice and referral for



2023 Volcano Art Prize Entry. Artist:

Suvana Parajuli

Title: Flamingo

Lead-Safety Message: [How many more flamingos must we lose before we do something about lead pollution?](#)

School: Creative Einstein

Age: 11

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/flamingo-2/>



blood lead testing. Contemporaneously, researchers will be funded to carry out blood lead surveys of the following categories of people.

This list is a good starting point for identifying individuals who could benefit from a blood lead test and categories of people who are at risk of current or past lead exposure and who require a blood lead test.

Any child or adult who presents for a or medical check-up or with any of the following signs or symptoms associated with lead exposure, or occupations, hobbies, behaviours or beliefs which result in lead exposure:

- Medical check-ups for pre-employment, pre-insurance, annual health check
- Vomiting, diarrhoea, constipation, abdominal pain
- Foreign body ingestion
- Anaemia or iron-deficiency
- Seizures
- Pica
- Behavioural problems
- Aggression and/or contrariness, including in the elderly
- Delinquency
- Violent crime (including homicide and domestic violence)
- Possible Autism Spectrum Disorder (ASD)
- Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD)
- Speech and other developmental delays
- IQ less than expected or less than 80
- Learning or development problems
- Depression, anxiety, and panic disorder
- Dementia, including Alzheimer's Disease
- Parkinson's Disease
- Essential tremor
- Amyotrophic Lateral Sclerosis (ALS)
- Multiple Sclerosis (MS)
- Motor Neurone Disease (MND)
- Hypertension, stroke, heart attack, heart disease
- Unexplained hearing loss and/or balance problems



2023 Volcano Art Prize Entry. Artist: Alex Jewson

Title: #GrandmaLead and Grandson

Lead Safety Message: Children look to us to invest in what's important: Children's intelligence, lead-safety, climate-safety, time together meditating while on your favourite "whale rock".

Description of work: Mobile phone photo.

<https://volcanoartprize.com/portfolio-item/grandmalead-and-grandson/>



- Cataracts
- Any person planning to conceive
- Pregnancy (blood lead testing will be carried out on anyone who is pregnant, in the first and third trimesters, and cord blood will be tested for lead at the birth)
- Lactation
- Preeclampsia
- Pre-term birth and low birth weight babies (test cord blood for lead at the birth)
- Babies born with unexplained birth defects (test cord blood for lead at the birth)
- Delayed achievement of developmental milestones (crawling, walking, speech, and others)
- Delayed puberty
- Loss of libido, reduced sperm count, sub-fertility, or miscarriage (spontaneous abortion)
- Menopause (including perimenopause)
- Joint pain
- Bone fractures, loss of bone density, or osteoporosis
- Dental caries
- Kidney disease
- Reduced kidney function
- Tobacco smokers, given that lead is found in tobacco and that smoking interferes with vitamin C metabolism which has lead removal/chelation role
- Possible alcoholism, given that lead can be found in alcohol and consumption of alcoholic beverages will increase the rate of absorption of lead from the gut
- People with occupation or hobby lead exposure, such as plumbers, radiator repairers, ship breakers, DIY renovators, bullet- or fishing sinker makers, scrap metal merchants, leadlighters
- A belief that lead and other toxic metals are therapeutic, for example, people who take Ayurvedic medication containing metal *bhasmas*
- Anyone who has been shot and has retained lodged lead shot, bullets, or shrapnel – these people require at least annual blood lead



2023 Volcano Art Prize Entry. Artist: Leo Manttan

Title: Fighting Kangaroos

Lead-Safety Message: Kangaroos shot but not killed by hunters can become aggressive due to lead poisoning from the lodged bullet fragments.

Age: 4

Description of Work: Non-toxic children's texta drawing

<https://volcanoartprize.com/portfolio-item/fighting-kangaroos/>



monitoring until the lead is removed from the body

This would mean a very high proportion of the population will be tested for blood lead. The reality is that all these symptoms may be exacerbated by lead and it is important to begin to track down those who may have a link that is caused by environmental lead.

All of these individuals will be monitored for blood lead and iron levels, have their environment tested and nutrition assessed, and be retested for blood lead following abatement measures. The awareness that lead may be involved in many of the underlying conditions outlined above will begin by making a blood lead test part of routine testing for annual check-ups and other testing regimes, such as in pregnancy and via up-to-date and enforced occupational lead health and safety regulations, prior to, and during, occupational exposure to lead (see ii, above).

v) Ensure that all blood lead results and patients' details are uploaded to the National Blood Lead Surveillance System

National governments will require pathology laboratories to upload ALL blood lead results with the patient's health system number, name, address, date of birth, gender and lead-risk occupation to the National Blood Lead Surveillance System (see i, above).

Further, the doctor who receives subsequent blood lead results of one of their patients, will be required to upload information on any efforts to made to reduce the blood lead level, the date of changes, and so on, and whether that resulted in a reduction or rise in the subsequent blood lead results, to the National Blood Lead Surveillance System.

The initial benefits of uploading ALL blood lead results to the System is that when an individual's reduction in blood lead level is observed in conjunction with doctor-documented interventions uploaded to the system, and when the government's target blood lead level is reduced and government interventions implemented, longitudinal analysis in the Blood Lead Surveillance data over time will demonstrate:

- Trends within different lead-risk groups
- Trends in those individuals who have further or ongoing blood lead monitoring
- The success or otherwise of the implemented interventions.



2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Apple, Pineapple, Pear, Cherries, Orange and Watermelon

Lead-Safety Message: All these fruits will help to keep you safe from lead.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio-item/apple-pineapple-pear-cherries-orange-and-watermelon/>



The other major benefit is that the National Blood Lead Surveillance System data can be de-identified and made available to researchers to form the basis of cohorts to examine lead-associated health, behavioural and longevity outcomes in longitudinal studies, as well as cohorts to examine the synergistic effects of exposure to lead and other toxicants, such as other heavy metals, and conditions, such as COVID-19 (see xiv, 3.0, 3.1 and 3.2, below).

The cost-benefit analysis of the blood lead research findings will justify increased expenditure in prevention of lead exposure and tertiary lead poisoning, as all previous lead longitudinal studies have done.

vi) Use pathology reports to re-educate lead-workers, employers, trade unions and health professionals as to current blood lead target and blood lead action levels, and new levels as revised

Many doctors are reliant on statements provided by laboratories on the pathology report of blood lead levels when interpreting the results to the patient, rather than to continuing medical education.

Employers and health professionals will be re-educated if their current understanding is that 20 or 30 or 50 µg/dL is the appropriate blood lead action level for workers or that an elevated blood lead level above the national target level is only of concern in young children.

Currently in Australia and New Zealand, pathology reports state the blood lead result and a range, e.g., 3.5 µg/dL (0-5 µg/dL). Unlike other pathology parameters, such as iron or cholesterol, where the range provided on the report is actually the healthy range, **there is no healthy range for blood lead levels.** The LEAD Group advises

that all blood lead results above 1µg/dL will be followed-up by actions/interventions which aim to bring the blood lead level to below 1µg/dL.

However, many patients receive the message from their doctor that their blood lead level is “normal” or “average” when it is below the government’s “action blood lead level” or “notifiable blood lead level”, for instance, in Australia of 5 µg/dL.

It has always been wrong to report blood lead results together with a range that can be misinterpreted as being “healthy”, “average” or “acceptable”. Blood lead results will only be reported by pathology laboratories in such a way that they can be compared to the recommended levels and action levels, and for the sake of the patient (or their parent/caregiver) to the average blood lead level



2023 Volcano Art Prize Entry. Artist: Claire Leight
Title: Not Just a Kid From Kingaroy
Lead-Safety Message: Not Just a Kid from Kingaroy - A Force to be Reckoned With
Description of Work: Photograph – Iphone

<https://volcanoartprize.com/portfoli>

[o-item/not-just-a-kid-from-kingaroy/](https://volcanoartprize.com/portfoli/o-item/not-just-a-kid-from-kingaroy/)



for their age range.

In the United States in the 2017-2018 national blood lead survey, the average blood lead levels are below 1 µg/dL in all age ranges and for all races, except Asians ([CDC n.d.](#)). Perhaps this is due to the continued use of Ayurvedic medicines containing metal *bhasmas* by some Asians in the US. As reported in [Angelon-Gaetz et al \(2018\)](#), in the period 2011-2018, close to 70% of 61 lead-poisoned children averaging 17 µg/dL in North Carolina were identified as Asian, including from India and Pakistan. In the Indian subcontinent, over 80% of the population use Ayurvedic medicines and 20% of Ayurvedic medicines contain lead and other heavy metals ([O'Brien 2020](#)).

One microgram per decilitre is about 60 times higher than pre-industrial humans whose blood lead levels were 0.016 µg/dL ([Flegal and Smith 1992](#)) (see Figure 2, above).

Using the statements on this laboratory report well becomes the challenge for good public health policy.

The following are example statements that could be included on a report:

There is no threshold below which lead exposure causes no harm, however, less lead exposure means less damage. Pre-industrial blood lead levels of humans were 0.016 µg/dL.

This laboratory has a limit of detection of 0.2 µg/dL.

The national target blood lead level is to be below 3.5 µg/dL.

The national blood lead "action level" is above 5 µg/dL – this is the level at which the government recommends that action be taken to reduce the blood lead level.

Laboratory lead testing of paint, soil, surface dust wipes, ceiling dust, water, backyard eggs, food, traditional and complementary medicines, traditional cosmetics and other consumer products provide the most accurate guidance to potential current sources of lead. (See vii, below)

In most countries, the average blood lead level is unknown. This will remain the case until national blood lead surveys are conducted. Once averages are known by age range, pathology reports will include the average relevant to the age range of the patient. This will prevent the assumption being made by the doctor or patient that any ranges are "averages", as noted above.

Governments also have a role in requiring pathology laboratories to continually upgrade their equipment if the limit of detection of blood lead results is higher than, say, half the average blood lead result as determined



2023 Volcano Art Prize Entry. Artist: Justine Cooney

Title: I Want a Lead Safe Future
Lead-Safety Message: I want a future in which people care about each other, and as a society regulate to protect people, particularly the vulnerable like children, from known and preventable dangers such as lead poisoning.

Description of Work: iPhone photo.

<https://volcanoartprize.com/portfolio-item/i-want-a-lead-safe-future/>



by the national survey.

For example, blood lead levels in all age groups in the United States currently average <1 $\mu\text{g}/\text{dL}$, yet numerous Australian laboratories have a limit of detection of 2.1 $\mu\text{g}/\text{dL}$ resulting in most patients being told that they have non-detectable lead in their blood, when they could in fact have more than twice the US average.

In some countries, blood lead levels are reported in micromoles per litre ($\mu\text{mol}/\text{L}$) or micrograms per litre ($\mu\text{g}/\text{L}$) rather than the international units of micrograms per decilitre ($\mu\text{g}/\text{dL}$). This leads to confusion among doctors and patients and makes it difficult to compare results to international guidelines and literature. It's recommended that these countries shift to the international reporting units (as used by WHO) as soon as possible, until the international community agrees to shift entirely to $\mu\text{g}/\text{L}$ (this has been recommended by [Taylor and Lanphear 2020](#)). When people see a blood lead result of 10 $\mu\text{g}/\text{L}$ (equivalent to 1 $\mu\text{g}/\text{dL}$), it's easier to conceptualise that they have a long way to go to get to a non-detectable blood lead level.

vii) Use pathology reports to advise doctors and their patients as to options for accurate and reliable testing for the likely environmental lead sources that may have elevated their blood lead level

In some countries, government advice cautions about the lack of sensitivity and potential false results from hardware stores) for lead in paint, dust wipes, ceramics, and so on.

As noted above (in vi), blood lead pathology reports provide an indirect and consistent opportunity to advise of the accuracy of laboratory lead testing of paint, soil, surface dust wipes, ceiling dust, water, backyard eggs, food, traditional and complementary medicines, traditional cosmetics and other consumer products.

Chemical analysis laboratories which test for lead in all these sample types are generally not permitted to provide interpretation, advice or recommendations on how to respond to the lead results. As well, most laboratories don't provide advice or information on sample for lead analysis, and don't supply laboratory-grade sampling equipment for lead sample collection.

Given these limitations, it is prudent of the pathology laboratories to provide information on laboratory testing for environmental lead.

In Australia, LEAD Group Kits, ([Australian Government Department of the Environment 2014](#)), sold by the not-



2023 Volcano Art Prize Entry. Artist: Jennifer Chuah
Title: Wild Blueberries
Lead-Safety Message: Medical Medium Anthony William calls Wild Blueberries both a heavy metal detox food and one of his top 10 Super Healing Foods. Excellent in smoothies!
School: Creative Einstein
Age: 12
Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/wild-blueberries/>



for-profit LEAD Group charity, are unique in the world for providing sampling instructions, advice and laboratory-grade sampling equipment, plus interpretation and individually tailored comments on the laboratory results with guidance as to priority mitigation measures. Clients can include individuals, government departments, shooting ranges, and environmental assessors, contractors, and public health officers (who collect the samples for the client). The advice provided on how to sample, what to sample, interpretation of results, and how to reduce blood levels in humans, animals (pets, backyard poultry and livestock, including "paddock pets") is enormously advantageous compared to standalone laboratory test results or environmental sample x-ray fluorescence (XRF) screening results.

All environmental and consumer product sample types are covered by LEAD Group Kits within Australia. Outside Australia, USA and Canada, all other countries can currently access LEAD Group Kits if they are not testing the sample types which will not pass through Australian customs due to biosecurity risks, such as soil, water, eggs, breast milk.

If any country were to locate chemical and food/medicine laboratories which have the capacity to test for the presence of lead at low levels then the above sample types could be analysed in that country with a LEAD Group Kit, and this would bypass the biosecurity issue.

Where possible, within-country laboratory testing of lead, in all sample types via LEAD Group Kits will be sourced to avoid the need for international transportation of any samples. Such laboratories will need to possess the capabilities to detect lead at low levels across multiple sample types.

With local community group involvement that is already, or is prepared to, collaborate with a knowledgeable and experienced charity, such as The LEAD Group, the rest of the services could be provided in-country - namely the provision of laboratory-grade sampling equipment, instructions, interpretation and advice to the client on the laboratory results and how to reduce their blood lead levels. This would in-effect be an Australian lead-safety intellectual property export to help to offset the burden of Australia's more than 120-year history of exporting lead.

Where DIY sampling kits which involve laboratory analysis and guidance, such as LEAD Group Kits, are available it would be beneficial for all patients to be advised of their availability (along with any government subsidy) within the blood lead pathology report.

viii) National governments will budget for the provision



2023 Volcano Art Prize Entry. Artist:

Joshua Fatsea

Title: Pet Rabbit

Lead-Safety Message: Protect pets by testing your soil for lead at a lab. In Australia, you can test at a lab via a LEAD Group Kit from

www.lead safeworld.com/shop

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

[https://volcanoartprize.com/portfolio](https://volcanoartprize.com/portfolio-item/pet-rabbit/)

[o-item/pet-rabbit/](https://volcanoartprize.com/portfolio-item/pet-rabbit/)



of affordable laboratory testing and guidance on lead results in potential environmental, food, and other sources of lead to individuals (of all ages)

Governments can also provide community-based lead testing DIY sampling kits, such as The LEAD Group's Kits (described in vii, above) which come with guidance based on laboratory lead results in environmental, food, traditional and complementary medicine, and other samples as to how to reduce blood lead levels.

When national governments budget for the provision of this type of testing (including advice) on a means-tested basis, not only will blood lead levels fall but community not-for-profit organisations providing such services will be financially supported to carry out other lead safety programs.

ix) Determine and allocate responsibility for prevention of lead exposure and lead poisoning

Prevention of lead exposure and poisoning is commonly divided, in health literature, as consisting of Primary, Secondary and Tertiary Prevention.

Primary Prevention is concerned with preventing public/individual lead poisoning and/or exposure in the first place.

Predominantly, it is the responsibility of intergovernmental organisations and national governments.

Individuals can also take action to prevent lead exposure in their homes, workplaces, or leisure activity venues, such as shooting ranges. For example, prior to purchase or rental of residential properties, individuals may test for lead and decide to carry out abatement prior to moving in or elect not to purchase or rent the property.

Secondary Prevention



2023 Volcano Art Prize Entry. Artist: Elizabeth O'Brien

Title: Stop New NSW Lead Mines

Lead Safety Message: I have a vision that the [2023 NSW Parliamentary Inquiry into whether the NSW regulatory framework for heavy metals and critical minerals mining is fit for purpose](#), will not only stop Bowdens and other proposed lead mines, but will find that no new lead mines in NSW can be justified! Let's use recycled lead (eg using government rebates to remove and recycle lead roof flashing so lead-safe rainwater can be collected) instead for our renewable energy projects!

Description of Work: Powerpoint collage of screenshots from [Communities anxious as NSW government spruiks mining, The 7.30 Report, 20 Sept 2023, ABC TV \(on Youtube\)](#)

<https://volcanoartprize.com/portfolio-item/stop-new-nsw-lead-mines/>



follows the finding of an elevated blood lead level and is concerned with preventing further lead exposure in individuals by environmental testing and removing the individual from the source of lead exposure or removing the source from the individual.

The state or local health authorities have a significant role to play either in lead testing and/or support for the removal of the lead source or the person from the source of exposure.

A typical example would be removal of lead contaminated soil from a backyard, or laying geotextile on top of it, then providing clean topsoil and grass to prevent soil exposure of children, pets and backyard poultry.

Another example would be a person changing their occupation or place of residence to prevent being exposed to lead.

Secondary Prevention is more diversified and therefore it is not entirely possible to designate in advance whose responsibility it is. The responsibility for collecting, collating, analysing and raising awareness of the results of blood lead testing (and possibly environmental lead testing) rests with governments.

Tertiary Prevention is concerned with preventing the lead already in a person's body from doing further harm (further than the harm done on the way into the organs and bone and teeth storage), including causing early morbidity and mortality.

Responsibility for Tertiary Lead Poisoning Prevention is also diversified from the individual experimenting with what reduces their own blood lead level to governments sponsoring long-term studies of the effects of certain treatment or intervention protocols.

There must be strategies for carrying out or encouraging all three forms of Lead Exposure and Lead Poisoning Prevention. These strategies need to be tailored to the specific circumstances of the particular country, but public awareness campaigns regarding the health effects of lead, possible sources and pathways of exposure, as well as what can be done to prevent exposure, cut off pathways, or reduce blood lead levels are essential.

Each country will establish both a national taskforce, like the President's Task Force on Environmental Health Risks and Safety Risks to Children (US), and an advisory group similar to the Lead Exposure and Prevention Advisory Committee (US).



2023 Volcano Art Prize Entry. Artist:

Christopher Nguyen

Title: Striped Kittens

Lead-Safety Message: Lead poisoning in cats often only shows as a loss of appetite and only sometimes vomiting and diarrhoea. Cats with lead toxicity are usually adult although occasionally kittens may be lead poisoned too.

School: Creative Einstein

Age: 11

Description of Work: Non-toxic colour pencils on paper. Lead Safety Message from <https://lead.org.au/fs/fst9.html>

<https://volcanoartprize.com/portfolio-item/striped-kittens/>



x) Carry out a National Blood Lead Survey of All Ages within 6 months of endorsing the National Lead Safety Policy on the Prevention and Management of Lead Exposure, Poisoning and Contamination

The first step in implementing a National Lead Safety Policy for preventing lead poisoning in a population is to do a baseline study - a National Blood Lead Survey of All Ages (across all age brackets).

Excellent examples of collation and analysis of national blood lead data collected since 1976 can be seen in the US Centers for Disease Control and Prevention ([CDC 2021](#)) *National Health and Nutrition Examination Survey (NHANES)*, although children who receive Medicaid in the US are only required to have their first blood lead test at 12 months of age, thus missing potentially 6-months' of lead exposure while crawling.

It is not a question of doing a survey to find out if anyone in the population of a particular country has lead in their blood because exposure to lead in some form or another is genuinely universal. A National Blood Lead Survey of All Ages is needed to develop specific strategies focused on sub-populations most at risk and then resurvey the population once the strategies have been implemented to evaluate their efficacy.

A National Blood Lead Survey of All Ages must include babies and children from at least age 6 months, as this is the age when crawling begins and therefore environmental lead exposure increases. The exception would be in lead mining and smelting (including lead-acid battery recycling/secondary smelting) towns, and near general aviation airports, where children as young as 4 months will be included due to the lead inhalation pathway.

Children 6-48 months old are at highest risk for lead exposure due to mouthing behaviours, pica, more efficient absorption, smaller size, and larger body burden.

Anybody seeking to conceive, those who are pregnant and women giving birth also need to be included in the National Blood Lead Survey of All Ages - cord blood can be collected during the birth and can be analysed for lead concentration.

Participants in the National Blood Lead Level Survey of All Ages will need to complete (or have their parent/guardian complete) a lead risk factor questionnaire



2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Orcas Porpoising

Lead-Safety Message: Being an apex predator puts orcas at risk of severe population losses from lead in their prey and from crude oil spills and air pollution from the exhaust of tour boats – all fuel contains some lead.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/orcas-porpoising/>



and a general health questionnaire that specifically includes incidence of lead-related health outcomes in the person (and their family health history), such as all the at-risk individuals, listed at iv (above).

The lead risk factor questionnaire would include –

➤ **For children and adults:**

- Race, given that darker skinned people on average have higher blood lead levels than lighter skinned people in similar circumstances
- Gender, given that males typically have higher blood lead levels than females
- Date of birth (in preparation for being resurveyed, when the individual may have gone up an age bracket)
- Pica behaviour
- Year of construction and description of home (including condition of paint and presence of lead lighting or leaded windows, and lead flashing when rainwater runoff is allowed to empty onto soil, rather than being directed to a stormwater drainage system)
- Presence during or following renovation/s
- Home in a leaded community such as:
 - Inner city
 - Communities with lead, zinc, copper, tin, silver or gold mining or smelting operations
 - Aluminium smelter communities (due to the use of leaded coal tar pitch in smelting aluminium)
 - Communities around fossil fuel facilities or close to petrol stations
 - Proximity to a general aviation airport
- Use of Ayurvedic medicine, given that if metal *bhasmas* are included the medicine is likely to contain lead (and other heavy metals)
- Whether anyone smokes in the household
- Consumption of backyard chicken eggs
- Consumption of homegrown root vegetables
- Consumption of locally sourced fish or seafood
- Consumption of water from:



2023 Volcano Art Prize Entry. Artist: Rohan Calvert

Title: Lead Safe Rooftop

Lead-Safety Message: [Men in White](http://www.meninwhite.com.au) organised degraded lead-painted fascia component replacement, then lead-safely stripped red lead paint from the gable end and painted all with non-lead paint. Next step: plumber to replace lead flashing with non-lead Colorbond flashing. Description of Work: Powerpoint collage of 7 photos & logo from www.meninwhite.com.au

<https://volcanoartprize.com/portfolio-item/lead-safe-rooftop/>



- A tank (including whether there is lead flashing in the rainwater collection area and whether the rainwater is collected in a lead mining and smelting community or near general aviation flightpaths), dam, river, bore, or well
 - Lead pipes
 - Lead-soldered pipes
 - A new brass tap installed within the previous three years
 - Whether anyone living in the house has occupational and/or hobby exposure to lead, for example, in paint (including artists' paints for adults), glazes, alloys, solders, leadlighting
 - Whether anyone living in the house is a shooter, fisher or hunter, or makes bullets or fishing sinkers at home
 - If the home is carpeted
 - Use of ceramicware that is in poor condition (chipped, crazed glazing, dishwasher-damaged, microwave oven-damaged and so on) particularly if antique and/or used to hold acidic, alcoholic or hot foods or beverages, or to heat food or beverages
 - Use of leaded crystal glassware for acidic, alcohol or hot food or beverages, or to heat food or beverages
 - Use of turmeric, especially if sourced from India, Bangladesh or Georgia
 - Use of cosmetics, such as kohl
 - The presence of exposed soil (non-grassed, mulched or paved)
- **For children:**
- Chewing or mouthing of potentially leaded items (such as painted toys, jewellery),
 - Year of construction of any other building/s where the child spends a significant amount of time and the renovation history of the building
 - Regular use of lead-painted playground equipment or play areas made from either tyre crumb or leaded PVC artificial turf
- **For adults:**
- Consumption of alcohol and/or cigarettes



2023 Volcano Art Prize Entry. Artist: Edison Nguyen
Title: Plastic shoe

Lead-Safety Message: Beware! Lead and other toxics have been found in cheap plastic shoes so never let a child or pet chew them! Australia and every other country needs a ban on children's consumer products that contain more than 90 ppm lead, as in the USA!

School: Creative Einstein

Age: 11

Description of Work: "Lead" (actually lead-free graphite) coloured pencils on paper. Lead Safety Message from <https://arnika.org/en/news/children-summer-shoes-they-often-contain-toxic-lead-and-hazardous-phthalates>

<https://volcanoartprize.com/portfolio-item/plastic-shoe/>



- Pregnant or breastfeeding
- Perimenopausal or menopausal
- Occupational and/or hobby exposure to lead
- Tattooed

This health history combined with data collection about lead exposure risk factors will enable the results to be immediately useful across a variety of research areas.

A National Blood Lead Survey of All Ages will also include testing for levels of iron, zinc and iodine, as these trace elements have a connection with lead and its effects, noting that both serum iron and ferritin are acute phase reactants and can vary significantly due to other factors. Low levels of iron and zinc in the blood increase the rate of uptake of lead. Iron and iodine deficiency can be mistaken for problems with brain development, one of the effects of lead poisoning.

Because of the negative impacts of both COVID-19 infection/s on heart health ([Raisi-Estabragh 2022](#)) and lead exposure, and the increased risk of all-cause mortality of both COVID-19 and lead, a National Blood Lead Survey of All Ages will include all known incidences of COVID-19 in the person and parameters of heart health in order to determine whether there is a relationship whereby people who have a higher blood lead level are more likely to die from heart attack or stroke following COVID-19 infection/s.

xi) Further research the lead sources and pathways for National Blood Lead Survey of All Ages participants who have blood lead levels above the current action level

Those participants of the National Blood Lead Level Survey of All Ages who have a blood lead level which exceeds the national action level will be offered government-funded laboratory testing of their likely sources of lead, starting with the usual soil, surface dust wipe, degraded paint, and water sources. Cases will be followed up until the blood lead level falls below the action level.

The likely lead sources and pathways for an individual can also be determined by using "isotopic fingerprinting" and other research techniques on blood, environmental samples, food, drink, cigarettes, ceramicware and so on.

This method is described in a paper presented at Standards Australia Conference "Lead in Blood" in



2023 Volcano Art Prize Entry. Artist: Elizabeth O'Brien
Title: Vaping and Smoking Both Lead Your Health to the Gutter.

Lead Safety Message: #Grandma Lead says protect your health from lead and radioactive polonium-210 which decays to lead plus multiple other toxics by neither smoking nor vaping. Read <https://leadsafeworld.com/vaping-lead-poisoning>
Description of Work: iPhone 8 photos collaged in Powerpoint

<https://volcanoartprize.com/portfolio-item/vaping-and-smoking-both-lead-your-health-to-the-gutter/>



1993 by Emeritus Professor Brian Gulson (founding head of The LEAD Group's Technical Advisory Board) and Karen Mizon, CSIRO, "Lead Isotope Method – Lead in Blood":

The lead isotope fingerprinting method makes use of the fact that the abundance of the isotopes of Pb [lead] from one geological source can be quite different to the abundance of the isotopes from another geological source. For example, Pb in Australia generally has a totally different profile (a $^{206}\text{Pb}/^{204}\text{Pb}$ of 16.0 –16.5) to that of Pb from Europe ($^{206}\text{Pb}/^{204}\text{Pb} > 18.0$). The profiles or abundances of the Pb ores are also usually quite different from those of Pb in the common rocks which surround the mineral deposits.

In using the fingerprinting method for determining the source of Pb in, for example, people, the researchers compare the Pb isotope profiles in blood and/or urine (but can also use nails and teeth) with those found in the potential environmental sources such as air, food, water and dust. In simple terms, the closer the similarity in isotope profiles between that in blood and an environmental source or sources indicates that the environmental sources may be a significant contributor to the Pb in blood.

Doing isotopic fingerprinting and analysis on the blood and relevant samples for each individual whose result was above the current action level is an essential follow-up to the national blood lead survey.

Even older participants' sources of lead exposure from earlier in their lives may be able to be identified and thus provide information to help identify patterns of lead exposure over time where that person grew up (see 2.4, below).

xii) Incorporate all National Blood Lead Survey of All Ages results and individual findings from isotopic research into the National Blood Lead Surveillance System

Integrate all results from the National Blood Lead Survey of All Ages and include individual findings derived from isotopic research into the National Blood Lead Surveillance System, so that the conclusions and trends can feed back into the lead awareness media campaigns (see xiii, below).



2023 Volcano Art Prize Entry. Artist: Devrim Yasar

Title: Moonlit Killer Whale

Lead-Safety Message: Keep lead out of the ocean and stop global sea temperature rising by switching from burning fuel – even unleaded fuel contains trace amounts of lead – to renewable energy so apex predators like killer whales can continue to thrive.

School: Creative Einstein

Age: 9

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio/o-item/moonlit-killer-whale/>



xiii) Fund the implementation of campaigns to increase public awareness of lead and manufacturers, distributors and consumer of alternatives

Government-run and government-funded lead education and media campaigns will inform actions taken by the public and professionals in creating a lead-safe product or service, lead-safe home, workplace, educational setting, childcare facility, places of leisure and hobbies (for example, shooting ranges, hunting and fishing locations, leadlighting, ceramics and jewellery studios/workshops), communities, regions and nations, and finally, the world.

For example, government funding will be provided to NGOs along with government-developed information (which in some cases may have been derived by an NGO or research organisation) about all the measures above so that this information can be disseminated via relevant websites, for example, The LEAD Group, Heart Foundation, and similar (see the full list at Addendum 1, below).

Learnings from the National Blood Lead Surveillance System (see i, above) and the National Blood Lead Survey of All Ages (see x, above) need to be incorporated into lead education and media (including social media) campaigns funded by government and carried out by government and a range of NGOs.

Excellent examples of lead poisoning case studies and trends in sources and pathways of lead exposure, often based on NHANES data, can be seen at the US Centers for Disease Control and Prevention (CDC) website in *Morbidity and Mortality Weekly Report (MMWR)* ([CDC 2023](#)).

Education and awareness campaigns to both consumers and manufacturers, distributors, and importers will include the existence of lead-free alternative products and ingredients. Some examples include:

- Tin or tungsten as alternatives for radiation shielding from x-rays and radioactive materials in items such as leaded vests, walls, boxes, cubicles, nuclear reactors and so on
- Artists paints for adults that are free from heavy metals
- Stainless steel to replace brass or bronze plumbing products, lead weights, lead bookmarks, lead curtain weights, lead shot inside teddy bears and other posable soft toys, lead soldiers and other game models, and galvanized products
- Non-leaded aviation fuels for general aviation (propellor-driven) planes and helicopters

As this National Lead Safety Policy is rolled out, the



2023 Volcano Art Prize Entry. Artist: Edison Nguyen
Title: Dragon

Lead-Safety Message: If you ever buy a metal miniature Dragon to paint, make sure the paints and the metal are lead-free.

School: Creative Einstein
Age: 11

Description of Work: "Lead" (actually lead-free graphite) coloured pencils on paper. Lead Safety Message from <https://lead.org.au/q&a/2006/20061102001.html>

<https://volcanoartprize.com/portfoli>



national government will be responsible for letting relevant non-government organisations (NGOs) know about all learnings that are discovered and their will be incorporated into outreach programs of these other organisations.

Lead education vitally extends to the provision of information on lead safety, exposure, poisoning and lead contamination prevention and management in training course material (including lectures and practical sessions).

This training information will help medical and health practitioners to identify potentially lead-exposed and lead-poisoned individuals and manage them appropriately; trades and building professionals to carry out lead-safe work, and all other professionals where lead exposure or lead contamination is a possibility to reduce lead exposure or lead contamination.

The public lead education and media campaigns might include, for example:

- Podcasts, video and social media platforms
- More traditional avenues, such as radio, television, newspapers, magazines, posters and art competitions
- Industry publications
- Online platforms to share fact sheets, articles and training courses (such as for D.I.Y. renovators)
- Information including lead-risk questionnaires at doctors and veterinary clinics
- Handouts at childcare and early learning centres, hardware stores (in the paint and plumbing sections), at shooting ranges, ammunition stores, at leadlighting, ceramics and jewellery studios/workshops, at local government offices and libraries
- Online shops where leaded- and potentially leaded-products are sold
- Mandatory labelling of products capable of causing lead exposure or contamination, for example:
 - "This heat gun/sander is not safe for use on leaded paint. Test the paint for lead at a laboratory before proceeding"
 - "This leaded solder must not be used in plumbing"
 - "This leaded PVC hose does not supply lead-safe water if left lying in the sun. Humans, pets, poultry and livestock should not drink water from this hose"
 - In any country where the WHO lead paint ban has not yet been legislated for **all** paint types, the paint types which contain more than 90 ppm lead or



2023 Volcano Art Prize Entry. Artist:

Leo Manttan

Title: Lion

Lead-Safety Message: Wild carnivores can ingest lodged lead bullets and shot in their prey. We need a global ban on lead ammunition to protect wildlife from lead poisoning.

Age: 4

Description of Work: Non-toxic children's texta drawing



indeed have added other heavy metals, will be labelled. For example, artists paints for adults will list the concentrations of specific heavy metals in each tube/colour and general warning labels regarding the hazards of all the heavy metal ingredients, as well as the synergistic effects of exposure to combinations of heavy metals (see 3.2, below)

The World Health Organisation (WHO) and the United Nations (UN) have created the Lead Paint Alliance and, at the suggestion of The LEAD Group, have declared the last full Sunday-Saturday week of October each year to be International Lead Poisoning Prevention Week of Action (ILPPWA).

The WHO/UN "Lead Week of Action", or ILPPWA, is an opportunity for governments, NGOs and individuals to run annual lead events (at home, overseas or online) to increase public awareness of lead and inform relevant professionals of appropriate testing and actions towards lead-safety. All levels of government should consider their own ILPPWA events and funding for other organisations to run such campaigns.

Public awareness campaigns will be evaluated to ensure return on investment, including by repeat blood lead surveys after education/awareness campaigns in targeted sub-populations and, where relevant, the provision of lead testing kits with instructions for environmental sampling, comments and interpretation of the results (see vii, above).

xiv) Examine and utilise research into health and environmental impacts of lead and deficits caused by past lead exposure and their effect on the gross domestic product (GDP), in order to justify budgetary allocations to both a National Lead Safety Policy

As mentioned above, [McFarland et al \(2022\)](#) estimated that in the US alone, over 824 million IQ points were lost during the 100-year era of leaded gasoline use. The study recommends:

Such lead loss estimation efforts should be repeated across other domains believed to be influenced by lead exposure (including criminal behavior, personality, psychopathology, social mobility, cardiovascular disease, kidney function, and pathological brain aging). Doing so would generate a more complete understanding of the contributions lead exposures may have made to these important outcomes, the ultimate benefits to society from lead's removal from gasoline (including, potentially, recent improvements in many of these



2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Wave Cresting at Sunset

Lead-Safety Message: Let's catch the wave of renewable energy as the sun sets on fossil fuel burning.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/wave-cresting-at-sunset/>



outcomes) and the costs of ignoring existing lead hazards, including lead's continued use in aviation fuel... and its wide underregulated use in commercial and industrial processes internationally.

There are crossovers in the benefits to be gained through lead safety and climate crisis aversion policies due to:

- Lead naturally occurring in soil, rocks and volcanic emissions and thus in all organisms, and therefore in all fossil fuels, coal tar pitch, dung and plants, especially within trees
- Lead-exposed organisms displaying more lead-related symptoms at increased temperatures
- Fires, floods, droughts, storms and other extreme weather events releasing and spreading lead contamination

National governments will take the following steps to both avert the climate crisis and reduce lead emissions:

- Disallow new coal, gas and oil mines
- Cease the export of all fossil fuels
- End fossil fuel subsidies
- Stop forest burning to create agricultural land
- Promote vehicles, marine vessels and aircraft that are fuelled by renewable energy sources, and
- Subsidise individuals and companies to reduce their carbon footprint, switch to renewable energy and minimise the burning of fossil fuels.

See The LEAD Group's LEAD Action News *Lead Poisoning and Climate Change* ([Whitton 2009](#)) and fact sheet: *What can I do about climate change AND lead?* ([O'Brien and Taylor 2009](#)).

Refer to policy proposals on research at xvi, xviii, 2.6, 3.1, 3.2 and 3.3 (below).

xv) Fund posthumous blood and/or bone lead testing

Posthumous blood and/or bone lead testing will be carried out to determine the role that lead might have played in:

- Severe air pollution mortality
- Heatwave event mortality
- Premature deaths, especially regarding its interactions with other morbidities
- COVID-19 deaths



2023 Volcano Art Prize Entry. Artist: Jennifer Chuah

Title: Pink Daisy

Lead-Safety Message: When lead dust pollution falls on flowers, bees collect it with the nectar and keep it in their bodies. Using renewable energy will help lower lead in air and in bees!

School: Creative Einstein

Age: 12

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/pink-daisy/>



Taking this a step further, posthumous testing of all individuals will illuminate lead's role in all-cause mortality and provide valuable incentive for preventing all lead exposure.

xvi) Utilise research on the effects of lead on fauna, flora, microbes and the environment to create environmental protection legislation

Research has already determined that lead harms wildlife and that plants stop growing in highly lead-contaminated soil and water, and that although soil biodiversity is generally depleted by lead contamination, some microbes and fungi can be utilised in bioremediation.

Every use of lead affects living organisms and their environment, whether it be exposure of farm animals, backyard chickens and aquatic life which allows lead to enter the human food chain; or the use of leaded ammunition and fishing sinkers which eventually harm wildlife; or allowing historical uses of lead, such as in paint and petrol and current uses of lead such as lead-acid batteries and AvGas, to be further distributed in the environment through poor management of demolition, paint on surfaces, storm water run-off, rainwater, dredged sediments, human sewage, and so on.

Legislation will be developed to:

- Prevent the addition of rainwater tanks to buildings without first removing lead flashing and leaded paint, lead spouting, and other sources of lead and requiring a first flush diverter to eliminate freshly fallen lead dust from the tank water
- Clean up shooting ranges and waterways where leaded ammunition and sinkers have been used and recycle the lead safely
- Require product stewardship on lead-acid batteries so as to ensure that all used lead-acid batteries (ULABs) are collected and recycled lead-safely and to research the potential for a circular economy with lead-acid batteries such that new lead-acid batteries are made entirely from the lead in ULABs
- Phase out lead mining, including setting policy to disallow the opening of new lead mines
- Require environmental clean-up be funded by companies that have profited from lead-related activities
- Lead mines will be phased out in favour of using recycled lead. New lead mines should not be necessary with the enormous amount of lead that is already in the world.



2023 Volcano Art Prize Entry. Artist: Jordan Ma

Title: Clownfish and Anemone

Lead-Safety Message: Clownfish rely on anemones for protection from predators, while anemones rely on clownfish waste for food. Every organism now relies on humans to protect them from our leaded waste.

School: Creative Einstein

Age: 8

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio>



xvii) Legislate to ensure that the recycling of the biggest use of lead complies with the requirements of a circular economy

A circular economy is defined by the United Nations Conference on Trade and Development (UNCTAD) as:

A circular economy entails markets that give incentives to reusing products, rather than scrapping them and then extracting new resources. In such an economy, all forms of waste, such as clothes, scrap metal and obsolete electronics, are returned to the economy or used more efficiently (UNCTAD n.d.).

The G7 acknowledged that “circular economy policies to improve design, reuse and safe recycling can contribute in addressing this issue [of lead and leaded waste management and reducing lead exposure in developing countries]” ([G7 Environment Ministers 2022](#), see full Communiqué in Addendum 5, below).

“Approximately 86% of the total global consumption of lead is for the production of lead-acid batteries mainly used in motorized vehicles, storage of energy generated by photovoltaic cells and wind turbines, and for back-up power supplies” ([UNEP n.d.](#)). “Nearly 99 million wet-cell lead-acid car batteries are manufactured each year [in the US alone]” ([US EPA 2011](#)).

Recycling rates for lead-acid batteries and the safety of recycling vary enormously from country to country. “Battery manufacturing accounts for greater than 85% of lead consumption in the world and recycling rate of lead–acid batteries in the USA is about 99%” ([Prengaman & Mirza 2017](#)).

Although the figure is similar in India, “A study found that 90 percent of lead batteries in India end up being recycled by unregulated small-scale operators.... There are many more [lead] contaminated sites than plants... [In] Bangladesh, where there are hundreds of informal companies, often breaking batteries and smelting their lead on vacant land... They keep getting chased off by the locals, but just move elsewhere, leaving behind thousands of contaminated sites” ([Pearce 2020](#)).

When new lead-acid batteries are made, 35% of the lead in them is freshly mined lead. Governments will need to legislate to transform the lead-acid battery manufacturing and recycling industries requiring them to create 100% recyclable lead-acid batteries in order to achieve a circular economy for lead-acid batteries. As Peter Hurley ([O'Brien et al 2005](#)) states:

[Lead-acid] battery makers can only use 65% of what [the recyclers] recover... [this is due to the use of lead-antimony alloy which is too



2023 Volcano Art Prize Entry. Artist: Percy Chau
Title: Favourite Fresh Foods
Lead-Safety Message: Whether you're a panda who just eats bamboo or a kid who loves sweet cherries and cake, we all need a lead-safe and climate-safe environment to keep growing our favourite fresh foods.
School: Creative Einstein
Age: 11
Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/favourite-fresh-foods/>



corrosive to recycle into the anode plate].

If they used lead-tin alloys then they could reuse nearly all the material they recovered/recycled, provided they could keep it separate from the lead-antimony... A lead-tin battery will last up to five times longer than a conventional lead-antimony battery, and [yet] the battery maker can't get 5 times the profit from the better battery.

As can be seen, lead as used today in lead-acid batteries (ULABs) is not yet a green eternally recyclable metal, so producer responsibility is essential to the management of ULABs.

Extended Producer Responsibility (EPR), also known as Product Stewardship, is a strategy to place a shared responsibility for end-of-life product management on producers, and other entities involved in the product chain, instead of the general public; while encouraging product design changes that minimize negative impacts on human health and the environment at every stage of the product's lifecycle. This allows the costs of processing and disposal to be incorporated into the total cost of a product. (CalRecycle 2023)

Governments will need to legislate for producer responsibility which mandates the use of 100% recyclable metal alloy in lead-acid batteries and the collection and lead-safe recycling of all the used lead-acid batteries that are already in the world (refer to see ii, above; Figure 5 in Addendum 2, below; and Addendum 5, below).

An example of lead-safe ULAB recycling certification is the Better Environmental Sustainability Targets (BEST) Certification for Lead Battery Manufacturers ([OK International 2007](#)).

xviii) Contribute to a global database of research of world's best practice on Lead Exposure and Lead Poisoning Prevention

Governments will contribute all their success stories in terms of legislation and reductions in blood lead levels in their country to a global database of research of world's best practise on Lead Poisoning Prevention, possibly to be developed by the World Bank, WHO or the UN, and promoted during International Lead Poisoning Prevention Week of Action (ILPPWA).



2023 Volcano Art Prize Entry. Artist: Joshua Quarters
Title: Shark

Lead-Safety Message: Apex predators like sharks biomagnify all the heavy metals like lead that their prey have bioaccumulated. Protect our oceans from leaded waste and stormwater and ban all leaded products like sinkers which might contaminate the sea.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/shark-3/>



1.0 Steps in Primary Prevention of Lead Exposure

"Primary prevention aims to prevent disease or injury before it ever occurs. This is done by preventing exposures to hazards that cause disease or injury, altering unhealthy or unsafe behaviours that can lead to disease or injury, and increasing resistance to disease or injury should exposure occur" ([Institute for Work & Health 2015](#)).

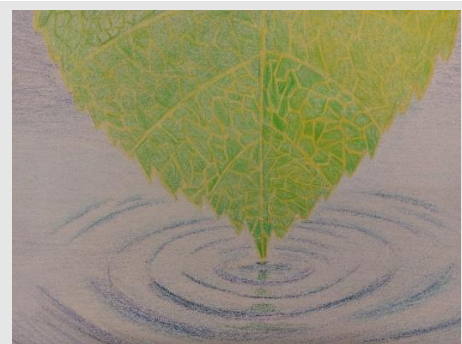
Some examples of Primary Prevention of Lead Exposure are:

- Banning leaded fuel (including AvGas), paint, ammunition, fishing sinkers, wheel weights, jewellery, plumbing solder, switching from lead soldered to welded food cans, and so on
- Setting limits on lead in all consumer products, but especially food, folk and traditional medicines, cosmetics
- Cessation of approvals for new lead mines
- Clean-up of communities around lead mines, smelters, e-waste and vehicle recycling plants, crematoria, incinerators, and anywhere that there has been lead-contamination from industry
- Increased collection and safe recycling of ULABs, lead flashing, lead plumbing, spent lead ammunition, and lead-contaminated sediments and building cavity dust
- The provision of nutritious food and non-contaminated drinking water
- The provision of washing facilities and clothes washing for workers in lead-related industries to prevent take-home lead dust
- Ensure that resources are available to help people quit smoking and avoid the overconsumption of alcohol, due to the presence of lead in many forms of alcoholic beverages

1.1 Provide environmental lead testing to every young child in public housing or living in poverty in an inner city area or leaded community

Government will provide environmental lead testing for every young child in public housing or living in poverty in an inner city area, and in every lead-mining and smelting town, every lead-acid battery manufacturing or recycling suburb, and all leaded towns (as described above, in x).

This first step in Primary Lead Exposure Prevention is vital because it is pre-emptive and as US attorney, Kelly J. Mikullitz (in video *Lead Poisoning... The Perfect*



2023 Volcano Art Prize Entry. Artist: Jennifer Chuah

Title: Leaf Creates Ripples

Lead-Safety Message: Just as touching the tip of a leaf to water creates ripples, so donating to environmental health charities such as [The LEAD Group's Lead Education and Abatement Fund \(LEAF\)](#) promotes the global spread of lead-safety.

School: Creative Einstein

Age: 12

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/leaf-creates-ripples/>



Predator - [Cornell Cooperative Extension of Oneida County 2019](#)) says:

Testing properties prevents the exposure altogether... [lead poisoning is] 100% preventable....

There are only a few jurisdictions that I am aware of that have laws in place that require the screening of properties. Those locations we are finding have had a huge reduction in lead levels in children and that is because we're not waiting until a child is poisoned to find the problems.

In the US practically all local public health agencies have trained lead poisoning prevention officers, XRF lead-screening machines, and equipment for sampling for laboratory lead testing. In the absence of these, the most cost-effective way for other governments to provide environmental lead testing is via a DIY lead sampling kit which includes instructions for sampling soil, paint, dust and water, as well as interpretation and comments on the laboratory lead results.

Sampling using a DIY sampling kit can, of course, be done by a trained professional (see 1.6, below) if one is available.

The LEAD Group already has lead sampling kits of this calibre available (described in vii, above), and these could be a simple solution for governments gearing up to combat lead exposure and lead poisoning prevention in children.

1.2 Use the results of the National Blood Lead Survey of All Ages and all lead interventions research in the country to identify persons/groups at risk of future elevated blood lead levels

A National Blood Lead Surveillance System (see i, above) and National Blood Lead Survey of All Ages (see x, above) will identify individuals and sub-populations with elevated blood lead levels. Analysis of the results and of in-country research into the effectiveness of interventions in cases of lead exposure will identify who, in general, is at risk of developing elevated blood lead levels including individuals with unusual or previously unknown risk factors.

The information gleaned will be directed at these at-risk sub-groups in an attempt to entirely prevent or reduce lead exposure.

For example, foetuses and breast-fed children could be protected from exposure to maternal lead through the research suggested in 3.2 (below).



2023 Volcano Art Prize Entry. Artist: Elizabeth O'Brien

Title: Research Lead Detox

Lead Safety Message: As we age, we can stop taking in new lead, keep our brains and bodies active, meditate, eat local, grow and prepare our own lead detox foods, take detox supplements and look after the planet in other ways, but to avert a climate crisis, we also need researchers to investigate what definitely removes lead from our brains and bodies so we can do that too!

Description of Work: Powerpoint collage of photos around a screenshot from [Dr Michael Cotton's Source Code Meditation \(SCM\) The 9 Summits of Transformation Online Course](#).

<https://volcanoartprize.com/portfolio-item/research-lead-detox/>



1.3 Promote identification and pre-emptive environmental testing to prevent future lead exposure via the same lead sources and pathways as identified in the National Blood Lead Survey

The National Blood Lead Survey isotopic fingerprinting research will identify sources and pathways by which lead exposure has occurred in Survey participants. This information will be used to identify and test the environment of other individuals at risk from future exposure to the same lead sources and via the same pathways (see xi and xii, above).

It is important to note that sources and pathways are not the same for every country, so the results of one country's national survey cannot be the sole source of information to set lead policy in another country.

For example, paint and petrol have been identified as the major source of lead poisoning of children and adults in the United States, whereas a national survey may reveal that air pollution, use of Ayurvedic medicine and/or use of human sewage as fertiliser on food crops and/or the use of industrial waste as livestock feed additives are the major sources of lead poisoning of all ages in any country with such practices.

1.4 Having identified persons/groups at risk and sources and pathways by which serious lead exposure has occurred, introduce regulations to prevent such exposures from occurring in others, so that each target can be met

This form of Primary Lead Exposure Prevention is the responsibility of national governments, but may, by international treaty or alliances, become an international issue.

Some examples are as follows.

- The WHO/UN Lead Paint Alliance encourages all national governments to create legislation to ban lead paint. WHO defines lead paint as paint containing more than 90 parts per million (ppm) lead
- Countries wanting to join the European Union (EU) or receive World Bank infrastructure funding have, in the past, been required to phase out leaded petrol for on-road vehicles
- In September 2021 the global elimination of leaded petrol was the first major achievement of the UN Partnership for Cleaner Fuels and Vehicles (PCFV)



2023 Volcano Art Prize Entry. Artist: John Spencer Onyango
Title: Anti Lead in Paint Campaign
Lead-Safety Message: Dr Faridah Were and the Chemistry Students Association of University of Nairobi work cooperatively with Basco Paints to spread the message that lead kills and lead paint must be banned in Kenya and globally.
School: University of Nairobi
URL of this short film: <https://youtu.be/QnKfHzILskY>
Description of Work: The video was taken during the 10th International Lead Poisoning Prevention Week of Action (ILPPWA) from 23rd-29th October 2022. It details the activities that took place during the week. It was focused on enhancing the efforts towards elimination of lead in paints.

<https://volcanoartprize.com/portfolio-item/anti-lead-in-paint-campaign/>



- The G7 Climate, Energy and Environment Ministers' Communiqué ([G7 Environment Ministers 2022](#), see full Communiqué in Addendum 5, below), Berlin, 27 May 2022 included the statement:

Underscoring our strong commitment to reduce lead in the environment, to reduce the disproportionate lead exposure in vulnerable communities, we encourage appropriate domestic regulation or control of lead in all countries, which can deliver societal benefits that far exceed the costs. The G7 aims to identify areas of action to strengthen the work to minimise lead pollution and exposure globally and strengthen cooperation with existing international initiatives and instruments, particularly SAICM [Strategic Approach to International Chemicals Management]. In doing so, the G7 will continue to work with multilateral organisations such as UNEP [United Nations Environment Programme], WHO and UNICEF [United Nations Children's Fund].

- The Basel Convention aims to protect workers, communities and the environment from unsafe lead waste processing by banning export by developed countries to less developed countries of ships for breaking, leaded waste (including e-waste), ULABs, and so on. The Basel Convention will be adequately policed and enforced and the technologies to recycle lead safely will be exported with lead mine products (ores and concentrates), and leaded wastes. For example, US exports of lead-acid batteries for recycling in Mexico has resulted in widespread contamination of soil around the recycling plants and lead poisoning of workers ([Fisher 2023](#), [Gottesfeld et al 2023](#)), with the enforcement of the Basel Convention, this would not occur.
- Lead is also found in many other existing products and by-products, such as leaded paint, motor vehicles, lead-acid batteries and ammunition. These sources need to be addressed, too.

Some national Primary Lead Exposure Prevention measures in relation to existing leaded products could include:

- Proposing to international bodies (such as the World Bank, International Civil Aviation Organisation (ICAO), and similar) by national governments, that similar global alliance/partnership (to the PCFV) to eliminate leaded AvGas be established. This alliance can be utilised to exchange information, strategies and raise awareness so that the global elimination of all leaded fuels could follow as closely as possible on the heels of the global elimination of leaded petrol
- Banning the use of lead in plumbing materials and other building and furnishing components



2023 Volcano Art Prize Entry. Artist: Haoze (Allen) Li
Title: Habitat of sea turtles
Lead-Safety Message: If you let out lead and not put it away safely, it can destroy the safe places where sea turtles can live
School: Highgate Public School
Age: 11
Description of Work: Acrylic painting

<https://volcanoartprize.com/portfolio-item/habitat-of-sea-turtles/>



(such as lead lighting, PVC cabling, drywall, radiation shielding, weighted curtains and so forth)

- Banning the use of leaded ingredients (metal ashes, called "metal *bhasmas*") in Ayurvedic medicine, or setting a maximum limit of lead permitted in traditional and complementary medicines and a requirement that imported traditional and complementary medicines be tested for lead at customs
- Severely limiting the acceptable contaminant level of lead in certain products, as in toys (not just in the surface coatings on toys), children's items (including glassware, crockery, clothing and playground equipment), jewellery and other consumer goods, plumbing fittings and water pumps and in paints including industrial, road marking, food/drink processing and agricultural machinery, anticorrosive and marine paints
- Banning leaded ammunition and fishing sinkers
- Banning leaded curtain and mosquito net weights, bookmarks, soda bottle caps, capsules on wine bottles and wheel weights for motor vehicles
- Reducing exposure to lead in certain processes or activities, such as paint management or demolition, and clean-up of used leaded ammunition from shooting ranges, by requiring contractors to be trained and regularly assessed for their lead-safety

1.5 Set maximum legislated limits for lead in various media, aimed at preventing blood lead levels from exceeding the current blood lead target and reset the limits once this is met

[Taylor et al 2012](#) (see ii, above) also stated that "Relevant legislation and standards relating to health and environmental levels of lead should be revised to achieve blood lead levels below 1 ug/dL."

Governments will set lead limits in environmental media and consumer products and will lower (reset) these whenever the blood lead action level is lowered for the relevant sub-population. Other lead limits will be set and similarly reset (lowered) to prevent and address environmental lead contamination.

For example, once leaded AvGas is eliminated, a government-funded ceiling dust removal service will be provided to all homes, childcare and child educational facilities above a set level of lead contamination in the ceiling dust. Further to this, areas under flight paths that have higher lead levels in soil, on surfaces and in water will also be remediated.



2023 Volcano Art Prize Entry. Artist:

Gordon Ma

Title: Reflection

Lead-Safety Message: Please reflect before you start to renovate or demolish. Test for lead in paint and ceiling dust, and make sure that lead is not released into our beautiful waterways.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio-item/reflection/>



Means-tested government subsidies will be provided for all areas impacted by the leaded petrol era to remove leaded ceiling cavity (or attic) dust before climate change induced storms damage roofs and ceilings releasing leaded dust into the occupied spaces.

Wetlands and flood plains with elevated lead levels in sediment, water and aquatic life must be restored to background lead levels, before climate change induced flood disperses the lead more widely, such as occurred with Hurricane Katrina.

United States *Lead Laws and Regulations* ([US EPA 2002](#)) also provide the world's best national model for lead standards for environmental media (water, air, soil, dust and waste) and aviation fuel, paint on existing surfaces, new paint, plumbing products and a range of consumer items including food and children's consumer items. Other ways that the US leads in this area is by requiring certification of remodelling and restoration professionals as well as lead assessors and inspectors, and requiring accurate measurement and reporting of toxic releases to air, land and water, and periodically lowering the thresholds for that reporting by industry ([US EPA 2022](#)).

National government responsibility also consists of setting and resetting (lowering) maximum limits for lead in:

- The first flush drinking water (after 9 hours stagnation/non-use time) from leaded brass plumbing fittings installed within the last three years, water pumps, galvanised water tanks, or where lead pipes or lead-soldered pipes are present
- Various environmental media including soil lead, surface dust wipe lead and tap (mains or tank) water lead in residential rental properties, public housing, educational and childcare settings
- Building cavity (ceiling, underfloor, wall cavity) dust to trigger removal by government certified contractors prior to the installation of heat or noise insulation or demolition
- "Clearance levels" of soil lead, tap water lead, and dust wipe lead loading on child-accessible surfaces following any contractor activities that have added new plumbing components (excluding stainless steel, which is not leaded), disturbed lead paint or ceiling dust, or demolition
- Newly manufactured or imported PVC products and painted products, for example, painted building components and mirrors
- Sediments to trigger controls on dredging activities to prevent the lead going into solution
- Storm water run-off and wastewater to trigger environmental controls such as required



2023 Volcano Art Prize Entry. Artist:

Kiana Parsyar

Title: Fruits And Tea

Lead-Safety Message: Fruits and tea are high in antioxidants and help detox lead poisoning. Persians love tea and put handmade carpets everywhere even under our tea cup!

School: St Anthony's Catholic Primary School

Age: 9

Description of Work: Watercolour

<https://volcanoartprize.com/portfolio-item/fruits-and-tea/>

[o-item/fruits-and-tea/](https://volcanoartprize.com/portfolio-item/fruits-and-tea/)



removal of lead roofing/flushing/spouting and replacement with non-lead substituted

- Waste (including slag, industrial, power plant/foundry/incinerator bottom ash, chimney/crematoria fly ash) to trigger requirements for burial in mined-out pits or other leachate controlled disposal sites, including incorporating into cement
- Air and water around crematoria and other areas where bodies are burned, such as the Ganges, to encourage the introduction of non-burning treatment of human remains, for example, Promession and Aquamation
- Fertilisers, treated sewage and other soil additives for agricultural crops, soil and mulch sold for vegetable and herb gardens and bedding to ensure the lowest possible lead levels in food
- Ground cover for poultry, domestic animals and paddock pets

Each country's government will have to decide what reduced level of lead in the product or process is necessary to achieve the blood lead level target it has set. This requires a revision of practices and processes, including by people actually involved in producing the product or carrying out the process. It will not necessarily require hi-tech research.

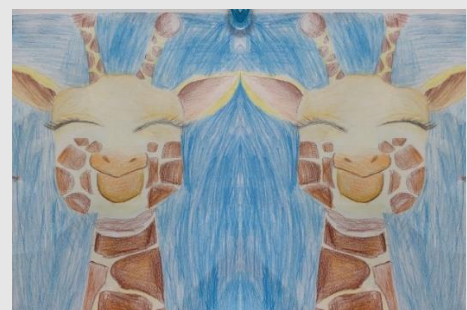
Primary Lead Exposure Prevention policies will include requiring the removal of leaded paint that is already in poor condition on surfaces in all government-controlled facilities for children and public housing with occupants who are children.

It is the responsibility of national governments (or international) to ban or reduce the use of lead in all paint and national or state government to require the addition of health warnings on tools which are available for general purchase in hardware stores, such as sanders and heat guns, as to the need to test paint for lead, as well as safe temperatures for removal of paint containing lead (see xiii, above).

Governments will also provide safe management of lead contaminated waste to ensure that lead does not re-enter the general environment.

1.6 Create legislation for the certification of professionals and tradespeople involved in the inspection, assessment, removal/abatement, and clearance of lead hazards

The government will create legislation for the certification of persons trained in the safe abatement or removal of contaminated ceiling or other building cavity dust, dust from occupied spaces, paint containing lead, lead-painted wood or metal building



2023 Volcano Art Prize Entry. Artist: Jordan Ma

Title: Heavy Rain Downs Giraffes

Lead-Safety Message: Switch to renewable energy so giraffes don't die from parasites and disease from increasing heavy rains from climate change from burning fossil fuels!

School: Creative Einstein

Age: 8

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/heavy-rain-downs-giraffes/>



components, or lead contaminated soil, cleaning out of lead contaminated rainwater tanks, etcetera.

A good model for certification of professionals and tradespeople involved in lead paint hazard management is Lead Renovation, Repair and Painting (RRP) Program ([US EPA n.d.](#)) in the US.

However, the following all need to have similar certification programs:

- Lead plumbing hazards
- Leaded dust hazards in building cavities, which can be released during demolition, renovations, and building modifications, such as the installation of insulation, downlights, skylights, and
- Leaded soil hazards, which can be released during excavation, gardening and landscaping activities, or when soil requires remediation.

As with the RRP Program, governments will require retraining of professionals and contractors who are already operating in these general areas.

1.7 Incorporate any changes from the above steps in Primary Lead Exposure and Lead Poisoning Prevention into educational materials and media campaigns

All learnings from steps taken to this point in Primary Lead Exposure Prevention will be incorporated into lead education and media campaigns (including social media) funded by government and carried out by government and a range of NGOs (see xiii, above and Addendum 1, below).

For example, once legislation has limited lead in paint to the World Health Organisation (WHO) limit of 90 ppm, all educational materials and media campaigns about lead in paint will reflect the change date/year in the new legislation or standard when advising on which surfaces should be tested for lead prior to paint management.

Public awareness campaigns will be evaluated to ensure return on investment, including by repeat blood lead surveys after education/awareness campaigns in targeted sub-populations and, where relevant, the provision of lead testing kits with instructions for environmental sampling, comments and interpretation of the results (see xii, above).

1.8 Ensure ongoing blood lead monitoring in at-risk



2023 Volcano Art Prize Entry.
Artist: Joshua Fatsea
Title: Angel Fish and Tulips
Lead-Safety Message: Whether we keep angel fish or grow tulips, we have to test their water and soil for lead to make sure they don't die.
School Name: Creative Einstein
Age: 10
Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portf>



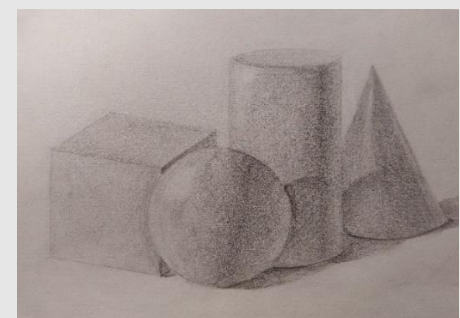
groups

Lead education campaigns and occupational health and safety regulations (see ii and ix, above) will ensure that every potentially lead-exposed person is blood lead tested prior to the lead exposure and regularly re-tested if lead exposure has not been controlled. Leaded communities must be a priority in these campaigns.

As in the United States, regulations will be created to ensure that renters and home buyers are advised of potential lead paint hazards prior to moving into a property and that blood lead testing of children is warranted prior to occupancy of these homes with likely lead hazards. Regulations will be created in all countries to ensure that renters and home buyers are also advised of lead in drinking water, soil and ceiling or other building cavity dust, where again blood lead testing is warranted prior to occupancy and shortly after occupancy in the case of young children.

Blood lead series should be requested (including for children) whenever a dwelling containing lead paint is going to be renovated, or any part of an old building is to be demolished (which may release lead contaminated dust from cavities) and again, within two weeks of the completion of the renovation/demolition in order to determine that no further clean-up is required. If there was an increase in the blood lead level retesting would occur again two weeks later.

Renovation/demolition projects will include clearance surface dust wipe and soil lead tests, as well as a system of fines for non-compliance with lead-safe work methods.



2023 Volcano Art Prize Entry. Artist: Jennifer Chuah

Title: Reflections

Lead-Safety Message: Before you repaint your home, reflect on when it was built. Test for lead in interior and exterior paint with a [LEAD Group Kit](#) in all Australian homes built before 1997.

School: Creative Einstein

Age: 12

Description of Work: Graphite pencils on paper

<https://volcanoartprize.com/portfoli>



2.0 Steps in Secondary Prevention of Lead Exposure

"Secondary prevention aims to reduce the impact of a disease or injury that has already occurred. This is done by detecting and treating disease or injury as soon as possible to halt or slow its progress, encouraging personal strategies to prevent reinjury or recurrence, and implementing programs to return people to their original health and function to prevent long-term problems" ([Institute for Work & Health 2015](#)).

Secondary Lead Exposure Prevention is mainly aimed at identifying people with a blood lead level above the target level and stopping further lead exposure by identifying what in the individual's environment is the probable source/s of the person's current exposure to lead and removing or safely abating the source/s until the blood lead level falls below the target level.

Secondary Lead Exposure Prevention deals with people at an individual level. It is about identifying groups of persons likely to be at risk of elevated blood lead levels and encouraging individuals who fit into such groups to have a blood lead test. These people will be identified - from either a national blood lead level survey, blood lead level research, or individual blood lead results uploaded into the National Blood Lead Surveillance System.

Having determined that the person has, or is at high risk of having, an elevated blood lead level, Secondary Lead Exposure Prevention is about preventing further exposure, by either removing the source of the lead from the person's environment or removing the person from contact with the source of the lead and to use proven nutritional intervention as relevant (see 2.6, below).

Responsibility for identifying individuals who need Secondary Lead Exposure Prevention is broad – it includes anyone who might suggest a blood lead test for an individual or laboratory lead testing of appropriate samples collected from the home environment (including backyard eggs and traditional medications), hobby studio or workplace, shooting range, etcetera.

For example:

- A teacher or learning intervention professional who notices behaviour associated (not necessarily exclusively) with high blood lead levels, such as hearing loss, poor handwriting, poor coordination, learning difficulties, ADD or ADHD, and delinquency
- A doctor or other health professional who, through questionnaires and/or detailed case history, identifies a patient who is:



2023 Volcano Art Prize Entry. Artists: Jayne Bentivoglio and Jo Miskle
Title: NSW Parliament House Protest
Lead-Safety Message: Our health, water, air, land and tourism are under threat! Protect Mudgee Region from toxic metal mining! Protect our greenfield agriculture! Lead poisoning is forever!

Description of Work: iPhone photos of protesters from Mudgee Region Health Alliance and Mudgee Region Action Group during International Lead Poisoning Prevention Week of Action 2023.

<https://volcanoartprize.com/portfolio-item/nsw-parliament-house-protest/>

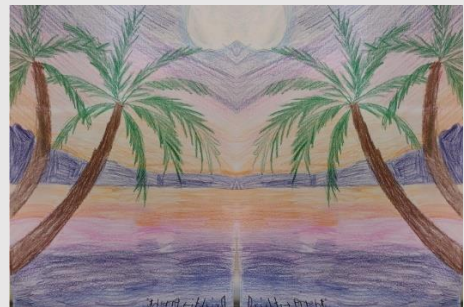


- At risk of lead exposure or is presenting with lead-related symptoms of at-risk individuals (listed at iv, above)
 - Exhibiting lead-related learning behaviours or difficulties
 - Is the playmate, housemate or sibling of a child with an elevated blood lead level
 - Trying to conceive, or is pregnant, breastfeeding, perimenopausal or menopausal
 - Presenting with hypertension, hearing loss, balance problems, bone fractures, loss of bone density or osteoporosis, cardiovascular disease, kidney disease, essential tremor, Parkinson's Disease, Motor Neurone Disease, early onset dementia or other lead-related health conditions
- A veterinarian who recognises a likely lead exposure in a pet or backyard poultry and advises the family to test the blood lead levels of their other animals and children
 - A lead advisor, occupational hygienist or site assessor who recommends blood lead testing on the basis of elevated lead levels in soil, dust, degraded paint, drinking water, backyard eggs, Ayurvedic medicines, or any other lead source in a home, school, work, leisure or hobby location

2.1 Include progress steps and graphs in the National Blood Lead Surveillance System for individuals who have second and further blood lead tests or bone lead XRF scans

The National Blood Lead Surveillance System will incorporate blood lead series result tracking for individuals as well as information from their medical practitioner as to what lead abatement or other interventions (including the timing, dose and other relevant details) have been instituted, blood lead results and dates of steps taken can be graphed (by the pathology provider). This is then a useful tool in reducing blood lead levels for other patients and populations.

Whilst blood lead monitoring over time is invaluable (see ii, above), when the first blood lead result is highly elevated for an individual (due to inadequate levels of awareness of the need to conduct blood lead testing) bone lead x-ray fluorescence (XRF) machines will be used to assess the total body burden of lead in order to make decisions on treatment. If bone lead XRF machines are currently not available in each country, governments will ensure that they are imported and ready for use both for individuals and research study cohorts (see 3.2, below).



2023 Volcano Art Prize Entry. Artist: Drishti Jonchhe
Title: Mirrored Palm Trees
Lead-Safety Message: Mirrors are painted on the back with lead paint so don't let your little brother or sister eat mirror backing paint.
School: Creative Einstein
Age: 7
Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/mirrored-palm-trees/>



2.2 Create legislation and awareness campaigns to prevent further lead exposure of individuals

National government responsibility also consists of creating appropriate legislation for intervention to prevent further lead exposure to individuals whose blood lead level exceeds the current action level and raising awareness through information programs directed at local councils, state agencies, landlords and realtors, teachers, doctors and health professionals, veterinarians, employers in industries where lead exposure is probable or possible and so on.

For example, the national government will set up a fund (perhaps using lead- and fossil fuel-mining royalties or diverted fossil fuel subsidies) to assist people particularly in lead-smelter and mining towns (and communities with zinc, copper, tin, silver, gold, aluminium and fossil fuel facilities), in public housing, Indigenous communities and poorer rural or inner-city areas, to:

- Pay for laboratory lead testing of soil, dust, paint, water, backyard eggs, Ayurvedic medicines, and other consumer products
- Provide interest-free grants or other financial support aimed at identifying and safely addressing sources and pathways of lead exposure and reducing the blood lead levels of those individuals.

Although some individuals will be able to afford laboratory testing of environmental samples themselves, in terms of social equity, testing and abatement costs will be covered by the government for those who are unable to meet these financial demands or who reside in public housing/government controlled housing.

2.3 Identify persons at risk using known risk factors and set action blood lead levels to prevent further lead exposure in each of the sub-populations for which target blood lead levels have been set

The action blood lead level is the level at which the government will intervene, or in the case of Secondary Lead Exposure Prevention, create regulations which require others (e.g., landlords, employers, state or provincial agencies) to take action, to bring down an individual's blood lead level.

The information (in educational materials) provided by a health department or health professional in an effort to determine or test for lead sources in the individual's environment will be specific to the country and indeed the region as local sources can impact hugely on case management.

Some of these local sources and personnel include:



2023 Volcano Art Prize Entry. Artist: Elizabeth O'Brien

Title: Indigenous Lead Safety
Lead-Safety Message: Indigenous

[Lead Safety Policy](#) needs to be developed in Australia urgently to help Close the Gap in health, housing, incarceration rates and education.

Description of Work: Microsoft Powerpoint collage of images created at

<https://imvoting.yes23.com.au/download> and <https://forms.gle/Kmxh8pEDchoM2Vs6A>

<https://volcanoartprize.com/portfolio>



- Lead, zinc, copper, tin, silver, gold and aluminium mines and smelters
- Fossil fuel mining and processing facilities and fossil fuel-burning power stations
- Lead manufacturing plants
- Trucking, shipping and wharf workers responsible for the handling, storage and transport of Tetra Ethyl Lead (TEL), AvGas, raw heavy metal materials between locations (such as from the mine/s to storage or processing facilities, refineries, smelters)
- Maintenance personnel working on the handling, storage and transport equipment for Tetra Ethyl Lead (TEL), AvGas, raw heavy metal materials who are not manufacturing plant personnel
- Lead-acid battery, e-waste and/or vehicle recycling plants or sites
- Bone and metal *bhasma* manufacturing sites
- Sites including homes and streets contaminated with lead, or painted or soldered lead contaminated reuse items or sites where leaded waste is illegally mined, processed, recycled, salvaged or used to make ammunition, fishing sinkers, jewellery, arts, crafts, and other DIY projects, and so on
- Uncontrolled waste dumps
- Ex-leaded petrol/gasoline service station sites
- Incinerators
- Crematoria
- General aviation airports (while leaded AvGas remains in use)

In order to prevent further lead exposure, any child or adult, including workers, with a blood lead level above the target level will be eligible for source and pathway identification/environmental testing, and nutritional and other interventions using the Hierarchy of Control for Managing Risk of Materials of occupational exposures.

Recent research into lead-related health effects makes clear that there is no longer any justification for accepting a higher blood lead level in an adult than in a child ([Roberts et al 2020](#)).

A good Secondary Lead Exposure Prevention strategy would prioritise those people with the highest blood lead levels.



2023 Volcano Art Prize Entry. Artist:

Mavis Zhou

Title: Flamingo

Lead-Safety Message: A million birds die in Europe each year from eating lead shot used by hunters. Ban lead shot and clean up the waterways!

School: Creative Einstein

Age: 6

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/flamingo-3/>



2.4 Undertake isotopic fingerprinting research on individuals who do not have identified lead sources or exposure pathways

Individuals who have been identified through the National Blood Lead Surveillance System as having elevated blood lead levels and yet do not have clearly identifiable lead exposure pathways will be offered isotopic fingerprinting research (as mentioned in xii, above) to pinpoint their current lead sources and exposure pathways.

If no current lead source is identified and the person is now living or working in a different region or country, utilising this research method, lead in the blood can be matched to lead sources in other regions or countries that they were exposed to earlier in life.

This could result in opportunities for Tertiary Lead Poisoning Prevention in other people who lived or worked in the same region or country (see 3.0, below).

Given the expense of this form of research, this will be funded by national governments, perhaps sourcing these funds from lead mining royalties and diverted fossil fuel subsidies.

2.5 Ensure ongoing blood lead monitoring to achieve Secondary Lead Exposure Prevention

When the first blood lead result is above the target blood lead level, ongoing blood lead monitoring is essential following the initial identification of lead sources and pathways and nutritional intervention for the individual, particularly in lead-smelter and mining towns, in public housing, Indigenous communities and poorer rural or inner-city areas.

Whilst lead workers will be informed via up-to-date occupational lead safety legislation that is enforced, hobbyists such as leadlighters, leaded glass makers, ceramicists, ammunition-makers, sinker-makers, shooters, jewellers and so on will be regularly informed by government of the need for ongoing blood lead monitoring and the available assistance should they return an elevated blood lead level.

Additionally, national medical protocols will be reviewed and updated to include a recommendation for blood lead testing if a child or adult presents with any of the signs and symptoms of lead exposure (listed at iv, above).

All blood lead results above the target level will be followed-up until re-testing determines that the blood lead level has fallen below the target for that sub-population.



2023 Volcano Art Prize Entry. Artist: Mia Chau
Title: Pandas

Lead-Safety Message: Just like pandas are black and white... with lead-safety and climate-safety you're either part of the problem or part of the solution!

School: Creative Einstein

Age: 6

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/pandas/>



2.6 Research nutritional and other interventions which may decrease lead absorption, increase lead elimination or overcome lead-induced deficits

Individuals with very high blood lead levels may require chelation treatment at the time of the lead exposure.

It is essential to establish whether non-traditional chelators, nutritional and/or other interventions can either decrease the rate of absorption of any lead encountered in future or increase the rate of lead elimination from the body.

As well, research into interventions will examine the lead-induced deficits and whether the intervention addresses these.

For example, slow handwriting, poor maths and reading ability, inability to sequence and follow instructions.

In their editorial about a preschooler blood lead survey, [Taylor and Lanphear \(2020\)](#) point out the need to evaluate the impact of behavioural changes, as opposed to merely legislative changes, in reducing blood lead levels. In other words, to research the efficacy of education and awareness campaigns which aim to impact behavioural changes, such as lead-safe renovation practices, and hygiene measures.

The results of isotopic fingerprinting (as discussed earlier in xii and 2.4), could be used to identify groups of people with current lead exposure who may benefit from these interventions.

2.7 Incorporate any learnings from the above steps in Secondary Lead Exposure and Lead Poisoning Prevention into educational materials and media campaigns

All learnings from steps taken to this point in Secondary Lead Exposure Prevention will be incorporated into lead education and media campaigns (including social media) funded by government and carried out by government and a range of NGOs (see xiii, above and Addendum 1, below).

For example, once a cohort of lead-poisoned people who take Ayurvedic medicines containing metal *bhasmas*, has been identified and action taken to remove the lead containing products from the market through compulsory recalls,



2023 Volcano Art Prize Entry. Artist: Freya Jing Feng
Title: Dragon Melissa
Lead-Safety Message: Art can help create a Lead Safe World.
School: Highgate Public School
Age: 9
Description of Work: Wood box painting
<https://volcanoartprize.com/portfolio-item/dragon-melissa/>



media campaigns will raise awareness that previously sold lead-containing medications should be discarded and not used.

Another example could be to incorporate lead exposure prevention messages in cigarette packaging and quit smoking programs.

Public awareness campaigns will be evaluated to ensure return on investment, including by repeat blood lead surveys after education/awareness campaigns in targeted sub-populations and, where relevant, the provision of lead testing kits with instructions for environmental sampling, comments and interpretation of the results (see vii, above).



2023 Volcano Art Prize Entry. Artist:
Christopher Nguyen

Title: Orange Dragon

Lead-Safety Message: Dragons and volcanoes should be the only natural smoke producers, let's not be one too.

School: Creative Einstein

Age: 11

Description of Work: Non-toxic colour pencils on paper

<https://volcanoartprize.com/portfolio-item/orange-dragon/>



3.0 Steps in Tertiary Prevention of Lead Poisoning

"Tertiary prevention aims to soften the impact of an ongoing illness or injury that has lasting effects. This is done by helping people manage long-term, often-complex health problems and injuries (e.g. chronic diseases, permanent impairments) in order to improve as much as possible their ability to function, their quality of life and their life expectancy" ([Institute for Work & Health 2015](#)).

Further to this, [Sample \(2022\)](#) states that "tertiary prevention reduces the morbidity associated with lead intoxication through chelation of lead from the blood and soft tissues" in individuals who have been exposed to or poisoned by lead.

Tertiary Prevention of Lead Poisoning is thus concerned with preventing the lead which is already in a person's body from causing further morbidity and mortality if left in the body.

Aside from the Secondary Lead Exposure Prevention measures noted in 2.4 and 2.5 (above), very high blood lead levels may require treatment and/or nutritional or other interventions for the individual at the time of the lead exposure. It is likely that treatment and other interventions are beneficial at any time later in life, even after lead exposure has been eliminated or the person has moved away from the lead source or area (region or country) where they were exposed to lead. These treatments include any measures which research indicates are useful in Tertiary Lead Poisoning Prevention (see 3.2, below) and would be called Tertiary Lead Poisoning Prevention measures.

The results of isotopic fingerprinting (as discussed earlier in xii and 2.4), could be used to identify groups of people who may benefit from Tertiary Lead Poisoning Prevention, even if they were never tested nor diagnosed with an elevated blood lead level.

The health impacts linked to elevated blood lead levels or the combination of elevated blood lead levels and other factors such as COVID-19 infection or the synergistic impacts of the combination of lead and mercury, or lead and other toxic exposures, will continue to expand as further research is conducted (see v, above).

In a study *Combined Effects in Toxicology – a Rapid Systematic Testing Procedure: Cadmium, Mercury, and Lead* ([Schubert et al 1978](#)), male rats were injected with a lead dose that caused a 1% death rate (LD1) - that is, the lead dose that when injected into 100 male rats, on its own, killed one of the rats. When an LD1 of lead was injected in combination with an LD1 of mercury, all of the rats died, resulting in a "lethal dose 100" (LD100) causing a 100% death rate. Thus, LD1 lead + LD1 mercury = LD100 lead AND



2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Reptilian Eye

Lead-Safety Message: Lead poisoning causes cataract blindness in humans and possibly in reptiles too. Don't leave lead sinkers behind when you go fishing!

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio-item/reptilian-eye/>



mercury synergistic effect.

3.1 Carry out or fund further research to discover if there are links between elevated blood lead levels at any age and the development of certain adverse health effects in later life

Lead exposure earlier in life is already strongly linked to developmental and fertility problems, gestational issues, such as ASD and ADHD, as well as many of the health problems which we normally associate with ageing, such as:

- Early death
- Hypertension, heart disease, heart attack, stroke
- Joint pain
- Alzheimer's disease and dementia
- Hearing loss
- Balance problems
- Cataracts
- Osteoporosis (researching whether it is better to leave lead in the bones or attempt to decrease bone lead levels)
- Reduced sperm count
- Loss of libido
- Parkinson's Disease, tremors
- Dental caries
- Renal problems

There is some evidence that ASD, stunted growth, writing ability, delayed onset of puberty, risk of teenage pregnancy, preeclampsia, schizophrenia, depression, and anxiety are also associated with lead exposure.

"Animal studies have demonstrated that the effects of various metals on brain development could be mediated through dysregulation in neurotransmission, and alterations in frontal and subcortical brain structures, several of which have also been implicated in ASD" ([Arora et al 2017](#)).

A study by [Szmajewicz et al \(2011\)](#) that included over 60,000 women found that "women who experience intense menopausal symptoms like hot flashes and night sweats ... may be protected from heart disease, stroke and even death years after the Change" ([Park](#)



2023 Volcano Art Prize Entry. Artist: Mudgee Region Action Group
Title: Stop Bowdens Lead Mine
Lead-Safety Message: Open cut lead mines hurt our health, environment and tourism. Help stop Bowdens mine. Bowdens intends to mine 130,000 tonnes of lead and build a large tailings dam across a fault line potentially creating a major acid mine drainage risk downstream. It's time to take action!
Description of Work: Scanned flyers collaged together in Powerpoint.

<https://volcanoartprize.com/portfolio-item/stop-bowdens-lead-mine/>



2011). Is this an example of tertiary lead poisoning prevention? Could it be that the hot flushes/flushes and night sweats are associated with higher blood lead levels and/or play a role in reducing blood lead levels which thus reduce the risk of hypertension, stroke and heart disease? Further, do night sweats, or sweating in general (e.g., during exercise or in hot weather), play the same role? Studies which ask participants to log their sweating events as well as logging showering the sweat off their skin (to prevent reabsorption of the lead in it) may show that sweating is advantageous in reducing blood lead levels.

Due to the impacts of both lead exposure and COVID-19 infection/s on heart health, the National Blood Lead Surveillance System data will be used to determine if there's a correlation between high blood lead levels and dying from COVID-19 or from a heart attack following a COVID-19 infection ([Raisi-Estabragh 2022](#)).

Governments will fund research into these health effects and other diseases associated with ageing that are linked to lead exposure either in utero or later in life. For example, research the following hypotheses:

- That all-cause mortality is increased when both lead exposure and other exposures/diseases associated with all-cause mortality occur in the same individual, due to synergistic effects.
- That associations can be found between vitamin D and calcium metabolism in darker skinned people.
- That many health ailments treated using Ayurvedic medicines which include metal, bone or horn *bhasma* ingredients are actually caused or exacerbated by these ingredients.

Discovery of such links would be a step in reducing or eliminating a source of significant morbidity.



2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Bioluminescent Blue Fungi and Bluebird

Lead-Safety Message: Earth is home to so many beautiful plants, animals and fungi, let's stop burning fossil fuels and make the world lead-safe so we can maintain biodiversity.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio->

[item/bioluminescent-blue-fungi-and-bluebird/](https://volcanoartprize.com/portfolio-item/bioluminescent-blue-fungi-and-bluebird/)



3.2 Carry out or fund research to test whether certain intervention protocols succeed in reducing the risk of development of associated adverse health effects

Once further lead exposure has been prevented (by source identification and removal), and/or a combination of nutritional intervention, chelation therapy or other treatments has successfully reduced blood lead levels, these individuals could form the basis of research cohorts.

Longitudinal controlled studies are needed to determine whether such interventions will avert anticipated adverse health outcomes, such as the risk of the development of ASD in children born to mothers who have been exposed to even low levels of lead prior to pregnancy or during windows of development and have (research cohort) or have not (control cohort) reduced their blood lead levels prior to conception.

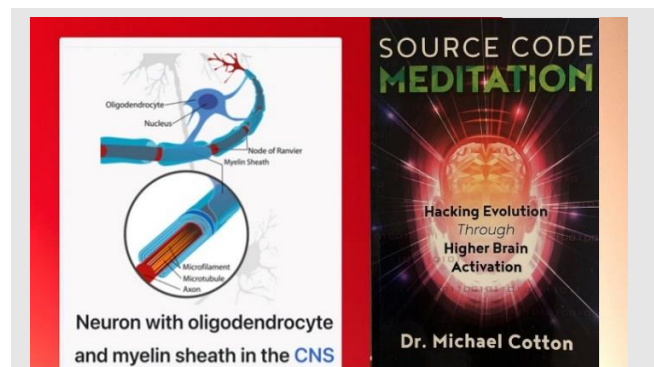
Further studies could be done to compare outcomes resulting from a one-time lead exposure versus chronic low-level exposure throughout childhood, or the working life, and so on.

Research is needed on whether treatment or other interventions prevent any of the associated adverse effects that are linked with lead, including: infertility and sub-fertility, preeclampsia, sub-optimal foetal and childhood development, and hypertension (causing stroke or heart attack), osteoporosis and balance problems leading to bone fractures, in later life, of persons who have ever been found to have an elevated blood lead level.

For example, a longitudinal controlled study could determine whether persons with known elevated blood lead levels, where cohorts undergo one of a variety of combinations of nutritional intervention and treatment, improve their morbidity and mortality, compared to matched controls who received no nutritional intervention or treatment.

Test the hypothesis that older adults treated for lead poisoning will be at reduced risk of all-cause mortality compared to matched controls who had similar bone lead XRF (x-ray fluorescence) and blood lead results but were not treated for lead poisoning.

Pre-conception women could be recruited for research into whether interventions that reduce blood lead levels also reduce the lead concentration in their



2023 Volcano Art Prize Entry. Artist: Elizabeth O'Brien

Title: Lead Myelin Meditation

Lead-Safety Message: Can lead-induced damage to myelin (which slows thinking and reaction time) be reversed by practicing Source Code Meditation? [Lead Safety Policy](#) proposes research!!

Description of Work: Microsoft Powerpoint collage of iPhone photos & a screenshot from <https://en.wikipedia.org/wiki/Myelin>

<https://volcanoartprize.com/portfolio-item/lead-myelin-meditation/>



cord blood at birth and in breast milk, and then compared to controls who are not given any interventions.

Similarly, breast milk in milk banks could be analysed for lead, then a cohort of women with the highest breast milk lead levels could be tested for blood lead and split into control and study groups, in order to then compare those who are given interventions to those who are not to determine whether breast milk lead levels fall in relation to falling blood lead levels.

This Tertiary Lead Poisoning Prevention research could include seeking to counter the effects of lead poisoning through dietary changes, chelation treatment, supplements, saunas, training which aims to detoxify the pre-frontal cortex (such as Source Code Meditation) and improve the functioning of neural pathways and/or exercise.

Research to test the hypothesis that people who are treated for lead poisoning prior to conception that have a history of leaded-fuel sniffing (or have other risk factors for lead exposure) and are at risk of parenting children with foetal alcohol syndrome, will have children that grow up to be less delinquent/aggressive/violent than those whose parents were not treated for lead poisoning.

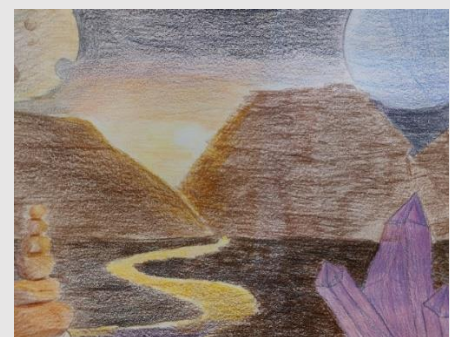
Given that higher blood lead levels are associated with hearing and balance problems and cataracts, all of which increase the risk of falls, and that lead is released from their store in bones when bones are fractured, and:

One in three adults aged 50 and over dies within 12 months [Katsoulis et al 2017] of suffering a hip fracture. Older adults have a five-to-eight times higher risk of dying within the first three months [Haentjens et al 2010] of a hip fracture compared to those without a hip fracture. This increased risk of death remains for almost ten years [Abrahamsen et al 2009]. (Brennan-Olsen 2018)

Test the hypothesis that older adults treated for lead poisoning will be at reduced risk for fractures and if they have fractures, they will recover and have reduced risk of death, compared to matched controls who had similar bone lead XRF and blood lead results, but were not treated for lead poisoning.

In countries like Australia, lead mining royalties could be used to fund this Tertiary Lead Poisoning Prevention research, not only in Australia, but also in countries that have imported Australian lead.

A country that is unable to do its own research, should request such research be carried out by the World Health Organisation or funded by philanthropic



2023 Volcano Art Prize Entry. Artist: Joshua Fatsea

Title: Only Volcanoes on Earth Spew Lead.

Lead-Safety Message: On Earth volcanoes spew lead dust and fumes because lead is in Earth's core but other planets and moons in our solar system are lead-free as far as we know.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

[https://volcanoartprize.com/portfolio](https://volcanoartprize.com/portfolio-item/only-volcanoes-on-earth-)

[io-item/only-volcanoes-on-earth-](https://volcanoartprize.com/portfolio-item/only-volcanoes-on-earth-)



organisations or other countries.

3.3 Require independent research of detoxification claims and immediately inform health professionals and the public of research findings

Detoxification remedies and protocols, apart from chelation therapy, in many cases do not have scientifically proven efficacy for their safety in use by children, reduction of blood lead levels, or improvement in health outcomes or reduction of health impacts from lead exposure.

The manufacturers of any treatment which claims to detoxify the body by any means will be required by government to fund independent research into the veracity of their detoxification claims including the treatments' ability to both reduce blood lead levels and reduce adverse health impacts of lead poisoning. Examples of unproven treatments that require independent evaluation include:

- Saunas
- Transdermal chelation via foot pads or patches
- Supplements
- Exercise plus liquid-only diets
- Liver cleanse
- Colloidal silver
- Epsom salts, trisalts and similar salts (ingested or in baths)
- Zeolite
- Mega-dose vitamin C, such as LivOn Lypo-Spheric™ Vitamin C
- 7,8-Dihydroxyflavone ([Zhang et al 2018](#))

It is only when health professionals and the public are immediately informed of and kept abreast of the results of such research that they can adequately manage the lead already in patients in a way that minimises the future adverse health effects and does no harm.

3.4 Promote the utilisation of all known ways of overcoming lead-associated health and behavioural problems

Examples include:



2023 Volcano Art Prize Entry. Artist: Mavis Zhou

Title: Black Birds On Black Trees

Lead-Safety Message: Many birds and other wildlife starve after Australia's bushfires which are now more extensive, more frequent and increasingly burn all night due to climate change-induced hot dry periods. Indigenous fire management practices and renewable energy farms are needed urgently.

School: Creative Einstein

Age: 6

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/black-birds-on-black-trees/>



- Maintenance of bone strength through appropriate dietary vitamin D and calcium (and/or supplementation) and weight-bearing exercises
- Physical exercise, cessation of smoking, weight-reduction to reduce hypertension
- Occupational therapy to improve handwriting and fine motor control
- Physiotherapy designed to increase neuroplasticity following stroke
- Learning languages, physical activity, music therapy, jigsaw puzzles, crosswords, word games, social interaction and other stimulation to maintain neural pathways to slow the progression of dementia and brain ageing
- Sound healing, meditation and mindfulness practices to decrease stress, anxiety and depression and in the case of Source Code Meditation or the Indigenous concept of connecting with Country (*The Dreaming Path: Indigenous Thinking to Change Your Life* by Dr Paul Callaghan with Uncle Paul Gordon 2022), to overcome lead's impacts on the pre-frontal cortex, such as impulse control and criminal behaviour
- Use of other chelating agents traditionally utilised in cases of extremely elevated blood lead levels

3.5 Incorporate any learnings from the above steps in Tertiary Lead Poisoning Prevention into educational materials and media campaigns

All learnings from steps taken to this point in Tertiary Lead Poisoning Prevention will be incorporated into lead education and media campaigns (including social media) funded by government and carried out by government and a range of NGOs (see xiii, above).

For example, government funding will be provided to NGOs along with government-developed information (which in some cases may have been derived by an NGO or research organisation) about successful blood lead reduction protocols or products so that this information can be disseminated via relevant websites, for example, The LEAD Group, Heart Foundation, and similar (see the full list at Addendum 1, below).

Public awareness campaigns will be evaluated to ensure return on investment, including by repeat blood lead surveys after education/awareness campaigns in targeted sub-populations and, where relevant, the provision of lead testing kits with instructions for environmental sampling, comments and interpretation of the results (see vii, above).



2023 Volcano Art Prize Entry. Artist: Drishti Jonchhe
Title: Three Layer Cake
Lead-Safety Message: Not all sweets are innocent. Sugar and sweets are sometimes recalled due to lead contamination. Both lead and sugar cause tooth decay.
School: Creative Einstein
Age: 7
Description of Work: Colouring pencils on paper
<https://volcanoartprize.com/portfolio-item/three-layer-cake/>



Addendum 1 – Examples of community organisations and professional bodies to run government-funded lead-safety media campaigns

The following is a list of organisations that would be suitable for lead-safety and lead-awareness media campaigns which will be required, see xiii, 1.7, 2.7 and 3.5, above.

This list serves to illustrate the point of the avenues available in disseminating this information. There is a multitude of other such organisations in all countries around the world.

Community Lead Organisations:

- The Lead Education and Abatement Design (LEAD) Group
- Lead Aware NZ (New Zealand)
- LEAPP Alliance, UK – Lead Exposure and Lead Poisoning Prevention Alliance
- Indian Society for Lead Awareness & Research (InSLAR)
- Campaign for Lead Free Water, UK

Other Community Organisations:

- Trade unions
- Employer bodies
- Organisations dealing with one or more of lead's impacts:
 - International Network for Children's Health, Environment and Safety (INCHES)
 - Australian Menopause Society (AMS)
 - Australian Breastfeeding Association (ABA)
 - Preeclampsia Foundation
 - Action on Pre-eclampsia
 - Heart Foundation
 - Dementia Australia
 - Fred Hollows Foundation
 - Christian Blind Mission (CBM)
 - The Bone Health Foundation
 - Royal Osteoporosis Society



2023 Volcano Art Prize Entry. Artist: Ananda Card

Title: Ananda Card, Lead Aware NZ

Lead-Safety Message: Spreading the word about lead safety and [educating New Zealanders about lead](https://leadaware.nz/). See <https://leadaware.nz/>

Description of Work: Collage of selfie & logo from <https://www.facebook.com/LeadAwarenessNZ/>

<https://volcanoartprize.com/portfolio-item/ananda-card-lead-aware-nz/>



Professional Bodies:

- Medical, health, occupational health, pathology and environmental medicine associations:
 - National Aboriginal Community Controlled Health Organisation (NACCHO), Australia
 - Australian Medical Association (AMA)
 - Australasian College of Nutritional and Environmental Medicine (ACNEM) Inc.
 - UK Health Alliance on Climate Change
 - American College for Advancement in Medicine (ACAM)
 - Society for Orthomolecular Health Medicine (OHM)
 - World Association of Societies of Pathology and Laboratory Medicine (WASPaLM)
 - American College of Eye Surgeons
 - The Royal Australian and New Zealand College of Ophthalmologists (RANZCO)
 - Australian and New Zealand Society of Nephrology (ANZSN)
 - International Society for the Study of Hypertension in Pregnancy (ISSHP)
 - International Osteoporosis Foundation
 - The UK Kidney Association
 - Australian Traditional Medicine Society (ATMS)
 - Australian Natural Therapists Association (ANTA)
 - Nutrition Society of Australia (NSA)
 - The Nutrition Society, UK
 - Australian Institute of Occupational Hygienists (AIOH)
 - New Zealand Occupational Hygienists Society (NZOHS)
 - The Australian and New Zealand Society of Occupational Medicine (ANZSOM)
 - International Maritime Health Association
- Building, trades and engineering:
 - Australian Institute of Building Surveyors (AIBS)



2023 Volcano Art Prize Entry. Artist:

Danny Wang

Title: Sea Level Rise

Lead-Safety Message: Burning fossil fuels not only spreads Lead pollution but also raises global temperatures, melts glaciers and sea ice, raises sea levels and drowns small islands.

School: Creative Einstein

Age: 6

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/sea-level-rise/>

- Building Officials Institute of New Zealand (BOINZ)
- Building Research Association of New Zealand (BRANZ)
- Australian Dust Removalists Association (ADRA)
- National Painting and Decorating Institute (NPDI)
- Master Painters, Australia, New Zealand, etc
- Painting & Decorating Association (PDA), UK
- Master Plumbers, Australia, New Zealand, etc
- Association of Plumbing and Heating Contractors (APHC), UK
- National Federation of Demolition Contractors (NFDC)
- Engineers Australia (EA)
- Institute of Engineers New Zealand (IPENZ)
- Engineering Council, UK
- Contaminated land:
 - Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (crcCARE)
 - Association of Geotechnical and Geoenvironmental Specialists (AGS)
 - Australasian Land & Groundwater Association (ALGA)
- Shooters (professional and hobbyists):
 - Sporting Shooters' Association of Australia (SSAA)
 - Sporting Shooters' Association of New Zealand (SSANZ)
 - National Rifle Association (NRA), US
- Others (professionals and hobbyists):
 - The New Zealand Sport Fishing Council (NZSFC)
 - British Society of Master Glass Painters' (BSMGP)
 - The Stained Glass Association of America
 - New Zealand Society of Artists in Glass (NZSAG) Ltd
 - The Australian Association of Glass Artists (Ausglass) Ltd



2023 Volcano Art Prize Entry. Artist: Marvin Xu
 Title: Zephyr Speaker Design
 Lead-Safety Message: This was designed as part of my Year 12 Visual Art - Design course but of course the final speaker would be lead-free!
 School: St Peter's College, South Australia
 Age: 17
 Description of Work: I used Plasticity & Keyshot to design and create a home speaker system which blends function with sculptural aesthetics.

<https://volcanoartprize.com/portfolio-item/zephyr-speaker-design/>



Addendum 2 – Global Cumulative Lead Mine Production compared to “1000 years of Carbon Dioxide”

There is a striking similarity of the shape of the following two graphs. This Model National Lead Safety Policy aims to drastically slow the rate of cumulative lead mine production (see xvii, above), and eventually stop it (see xvi, above). In turn, the reduction in lead in humans will help to reduce carbon dioxide in the atmosphere.

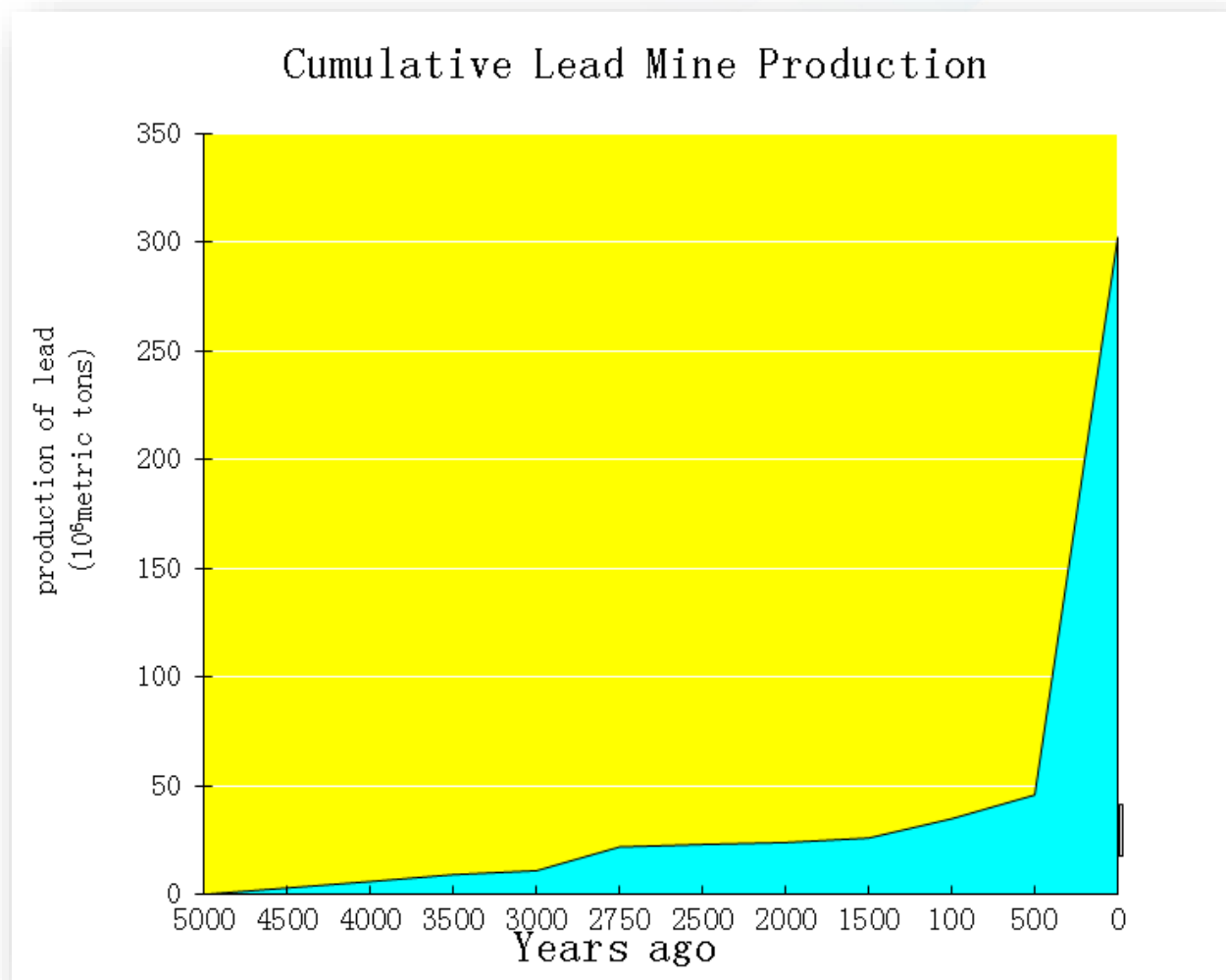


Figure 5. Cumulative production of lead over historic time. Reprinted from Flegal & Smith. (NRC 1993 Figure 1-5 page 21). Figure reprinted with permission from *Measuring Lead Exposure in Infants, Children, and Other Sensitive Populations*, 1993, by the National Academy of Sciences, Courtesy of the National Academies Press, Washington, D.C.

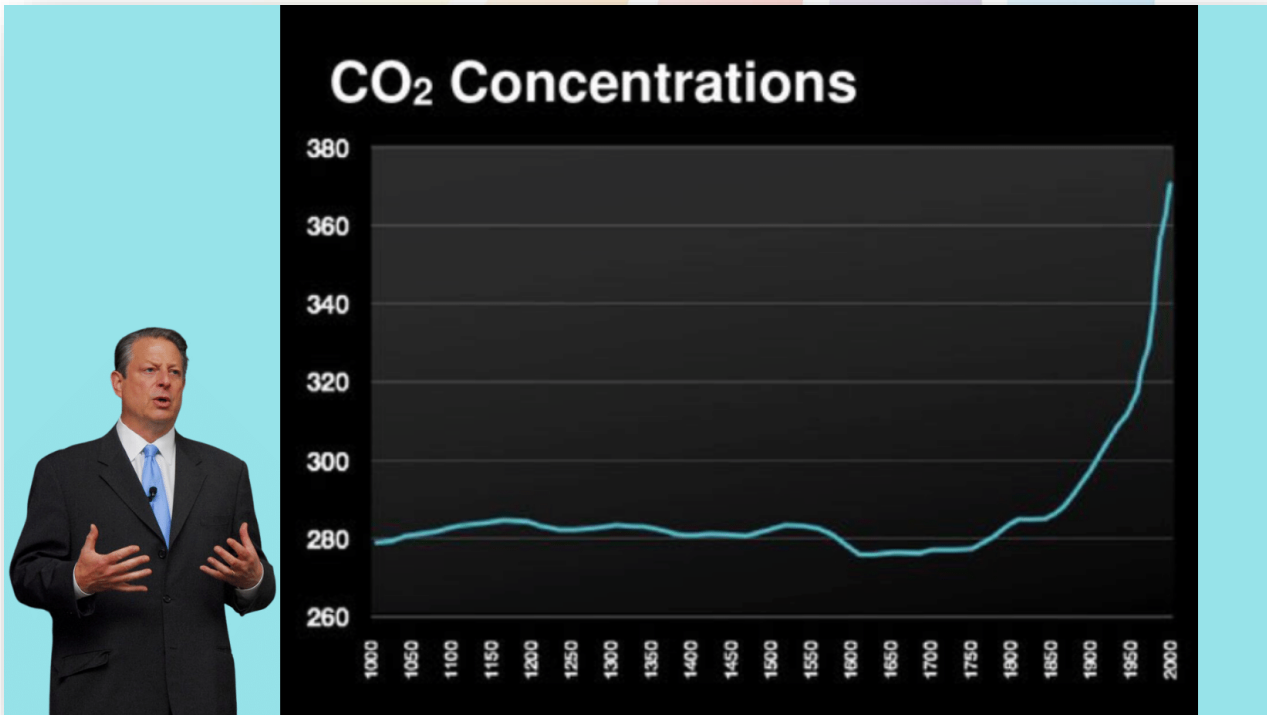


Figure 6. Al Gore's "1000 years of carbon dioxide", slide from *An Inconvenient Truth* (Gore 2006).



2023 Volcano Art Prize Entry. Artist: Siobhan Hannigan
 Title: Help
 Lead Safety Message: "I want my Pb to be lead free. Can you help us?"
 Description of Work: Mixed media ink watercolour teabags and found objects.

<https://volcanoartprize.com/portfolio-item/help/>



Addendum 3 – The Burden of Responsibility for Creating a Lead-Safe World... and Averting Climate Crisis

There is a special duty of care for countries which financially benefit from mining and exporting lead and fossil fuels to assist countries which import the exported lead and fossil fuels, especially Low- and Middle-Income Countries (LMICs) to create their own national policy aimed at achieving lead safety.

For the countries that profit most from exporting lead and fossil fuels, such as Australia, both the national and other countries', especially LMIC's, lead safety programs could be funded by lead and/or fossil-fuel mining royalties. (See also Addendum 5, below.)

According to Workman ([2022a](#), [2022b](#), [2022c](#), [2022d](#)), for the 2021 year, the following countries were the top 15 exporters based on the highest dollar value worth –

The top 15 Lead exporting countries:

Below are the 15 countries that exported the highest dollar value worth of lead (including articles made from lead) during 2021.

1. Australia: US\$841.3 million (9.4% of total lead exports)
2. South Korea: \$722 million (8%)
3. United Kingdom: \$606 million (6.7%)
4. Germany: \$558 million (6.2%)
5. Canada: \$476.4 million (5.3%)
6. India: \$460.6 million (5.1%)
7. Belgium: \$454.7 million (5.1%)
8. China: \$273.6 million (3%)
9. United States: \$270.4 million (3%)
10. Russia: \$263.8 million (2.9%)
11. France: \$248.6 million (2.8%)
12. Poland: \$228.7 million (2.5%)
13. Mexico: \$219.1 million (2.4%)
14. Netherlands: \$215.5 million (2.4%)
15. Kazakhstan: \$215.2 million (2.4%)



2023 Volcano Art Prize Entry. Artist: Suvana Parajuli

Title: Burnt Bush

Lead-Safety Message: Trees take up lead from the soil which is why oil, coal and gas contain lead. If we stop burning fossil fuels to stop climate change, we'll have fewer bushfires releasing that lead as smoke and ash!

School: Creative Einstein

Age: 11

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/burnt-bush/>



By value, the listed 15 countries shipped 67.4% of globally exported lead in 2021 ([Workman 2022a](#)).

Top 15 Coal exporting countries:

1. Australia: US\$43.9 billion (35.7% of total coal exports)
2. Indonesia: \$26.5 billion (21.6%)
3. Russia: \$17.6 billion (14.3%)
4. United States: \$9.7 billion (7.9%)
5. South Africa: \$6.08 billion (4.9%)
6. Canada: \$6.05 billion (4.9%)
7. Colombia: \$4.4 billion (3.6%)
8. Mongolia: \$1.9 billion (1.5%)
9. Mozambique: \$1.1 billion (0.9%)
10. Kazakhstan: \$929 million (0.8%)
11. Netherlands: \$882.5 million (0.7%)
12. Poland: \$828 million (0.7%)
13. Philippines: \$596.4 million (0.5%)
14. Mainland China: \$419.4 million (0.3%)
15. Vietnam: \$315.1 million (0.3%)

By value, the listed 15 countries shipped 98.6% of global coal exports in 2021 ([Workman 2022b](#)).

The top 15 Petroleum Gas exporting countries:

1. United States: US\$67.6 billion (18% of exported petroleum gas)
2. Norway: \$58 billion (15.5%)
3. Australia: \$37.98 billion (10.1%)
4. Qatar: \$37.97 billion (10.1%)
5. Canada: \$15.3 billion (4.1%)
6. Germany: \$14.18 billion (3.8%)
7. Algeria: \$14.15 billion (3.8%)
8. Belgium: \$11.8 billion (3.2%)
9. United Arab Emirates: \$10.1 billion (2.7%)
10. Malaysia: \$9.9 billion (2.7%)
11. Russia: \$8.8 billion (2.4%)
12. Indonesia: \$7.5 billion (2%)



2023 Volcano Art Prize Entry. Artist: Julia Jia
Title: Spreadable Lead Sunset Clause
Lead-Safety Message: To protect our air, land, rivers and oceans from spreadable lead, the world needs to ban all leaded products that are easily dispersed. For example lead sinkers, ammunition, weights and old style lead acid batteries that leak.
School: Creative Einstein
Age: 9
Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/spreadable-lead-sunset-clause/>



13. Oman: \$7.2 billion (1.9%)
14. Turkmenistan: \$6.3 billion (1.7%)
15. Nigeria: \$5.9 billion (1.6%)

By value, the listed 15 countries shipped 83.5% of global petroleum gas exported in 2021 ([Workman 2022c](#)).

The top 15 Crude Oil exporting countries:

1. Saudi Arabia: US\$161.7 billion (16.5% of exported crude oil)
2. Russia: \$82 billion (8.3%)
3. Canada: \$74 billion (7.5%)
4. Iraq: \$72.1 billion (7.3%)
5. United Arab Emirates: \$69.4 billion (7.1%)
6. United States: \$41 billion (4.2%)
7. Norway: \$40.2 billion (4.1%)
8. Kuwait: \$36.3 billion (3.7%)
9. Nigeria: \$30.6 billion (3.1%)
10. Brazil: \$27.9 billion (2.8%)
11. Libya: \$27.8 billion (2.8%)
12. Angola: \$25.4 billion (2.6%)
13. Oman: \$24 billion (2.4%)
14. Mexico: \$23.6 billion (2.4%)
15. Kazakhstan: \$17.6 billion (1.8%)

By value, the listed 15 countries shipped 76.7% of globally exported crude oil in 2021 ([Workman 2022d](#)).



2023 Volcano Art Prize Entry. Artist: Julia Jia
Title: Glacier and Penguins
Lead-Safety Message: Lead emitted into the air anywhere travels in wind currents to contaminate the highest peaks and ice at the poles. Switching to renewable energy will keep global temperatures stable, stop ice melting and also save our wildlife from lead.
School: Creative Einstein
Age: 9
Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/glacier-and-penguins/>



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2023 Volcano Art Prize Entry. Artist: Rishab Vohra
Title: Favourite Foods
Lead-Safety Message: Whether you're a panda who just eats bamboo or a kid who loves cake, we all need a lead-safe and climate-safe environment to keep growing our favourite foods.
School: Creative Einstein
Age: 9
Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/favourite-foods/>



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2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Lead Free Worlds

Lead-Safety Message: If you can't wait for Earth to become lead safe, just go live on any other planet or moon in our solar system – they are all lead free as far as we know.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio-item/lead-free-worlds/>



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<https://www.cdc.gov/climateandhealth/effects/default.htm>

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<https://www.cdc.gov/nceh/lead/data/blood-lead-reference-value.htm>

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(2019) *Lead Poisoning... The Perfect Predator,*
2-Mar-2019,



2023 Volcano Art Prize Entry. Artist:
Rishab Vohra

Title: Moon High Tide Flooding

Lead-Safety Message: By the time I turn 21, NASA predicts that if we let climate change continue to raise sea levels, the moon's tilt cycle will increase high tide flooding in all coastal communities. Please make the world lead-safe now to increase brainpower so we can avert climate crisis!

School: Creative Einstein

Age: 9

Description of Work: Colouring pencils on paper. Lead Safety Message from "[The moon's natural wobble alters Earth's tides. With climate change, that's bad news](#)" by Denise Chow, ABC News USA, July 16, 2021.

<https://volcanoartprize.com/portfolio-item/moon-high-tide-flooding/>



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2023 Volcano Art Prize Entry. Artist:

Christopher Nguyen

Title: Jellyfish

Lead-Safety Message: Some jellyfish can excrete most of the lead they absorb but will die if the water goes above 33 degrees Celsius. We must stop global warming and protect ocean ecosystems!

School: Creative Einstein

Age: 11

Description of Work: Non-toxic colour pencils on paper

<https://volcanoartprize.com/portfoli>

[o-item/jellyfish/](https://volcanoartprize.com/portfoli-o-item/jellyfish/)



<https://www.bundesregierung.de/resource/blob/974430/2044350/84e380088170c69e6b6ad45dbd133ef8/2022-05-27-1-climate-ministers-communicue-data.pdf?download=1>

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2023 Volcano Art Prize Entry. Artist: Joshua Quarters
Title: Penguin Pair
Lead-Safety Message: Heavy metals like lead (eg from contaminated stormwater entering the ocean) bioaccumulate in penguins then biomagnify in their predators.
School: Creative Einstein
Age: 10
Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/penguin-pair/>



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2023 Volcano Art Prize Entry. Artist: Julia Jia
Title: Panda and Flamingo
Lead-Safety Message: We need to de-lead ourselves and prevent our children being lead poisoned so we're smart enough to solve the environmental problems we face in protecting even iconic animals and birds from climate change.
School: Creative Einstein
Age: 9
Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio/o-item/panda-and-flamingo/>



https://www.lead.org.au/bblp/Green_lead/cpbatteries.html

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2023 Volcano Art Prize Entry. Artist: Edison Nguyen
Title: Wild Blueberries

Lead-Safety Message: Anthony William's 30 day heavy metal detox diet (eating mostly raw, preferably organic fruits and vegetables and a delicious wild blueberry and coriander smoothie each day), could actually make your blood lead level fall!

School: Creative Einstein

Age: 11

Description of Work: "Lead" (actually lead-free graphite) coloured pencils on paper. Lead Safety Message from

<https://lead.org.au/lanv19n4/LANv19n4-25.pdf>

<https://volcanoartprize.com/portfolio-item/wild-blueberries-2/>



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Exposure and prevention, *Up To Date*, 18-Jul-2022,



2023 Volcano Art Prize Entry. Artist: Jordan Ma

Title: Get to the Point

Lead-Safety Message: If we don't start moving to reduce carbon emissions today in 2023, our future is very dark.

School: Creative Einstein

Age: 7

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio>

[o-item/get-to-the-point/](https://volcanoartprize.com/portfolio-item/get-to-the-point/)



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Tsai, PL and Hatfield, TH (2011) *Global Benefits From the Phaseout of Leaded Fuel - Going Unleaded*, Journal of Environmental Health, Dec-2011,



2023 Volcano Art Prize Entry. Artist: Julia Jia

Title: Quilling Paper JJ

Lead-Safety Message: Let's hope that the glue used in quilling paper art all over the world is no longer leaded.

School: Creative Einstein

Age: 9

Description of Work: Coloured quilling paper cut, curled and glued to a board

<https://volcanoartprize.com/portfoli>

[o-item/quilling-paper-jj/](https://volcanoartprize.com/portfoli/o-item/quilling-paper-jj/)



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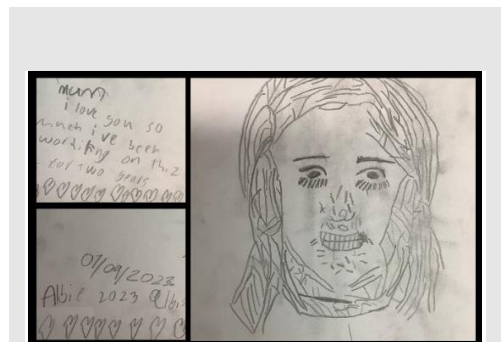
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2023 Volcano Art Prize Entry. Artist: Albie Scott
Title: Mum, I love you so much
Lead-Safety Message: Drawing with a lead free pencil, leading a lead free life
School: Dutton Park State School
Age: 10
Description of Work: Pencil drawing on paper; a portrait of Mum

<https://volcanoartprize.com/portfolio-item/mum-i-love-you-so-much/>



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Angerer, J
and Schulz,
C (2010)



2023 Volcano Art Prize Entry. Artist: Joshua Fatsea

Title: Protect Birds From Lead

Lead-Safety Message: Birds can easily eat lead shot or lead sinkers then die of lead poisoning. Ban lead in hunting and fishing.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/protect-birds-from-lead/>



Reassessment of critical lead effects by the German Human Biomonitoring Commission results in suspension of the human biomonitoring values (HBM I and HBM II) for lead in blood of children and adults, *International Journal of Hygiene and Environmental Health*, Jul-2010,

<https://www.sciencedirect.com/science/article/abs/pii/S143846391000043X>

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2023 Volcano Art Prize Entry. Artist: Ella Hawkes

Title: Shame

Lead-Safety Message: The Volcano Art Prize is not just about art; it's about making the world lead-safe.

School: Merici College

Age: 16

Description of Work: Oil on canvas.

<https://volcanoartprize.com/portfolio>

[o-item/shame/](https://volcanoartprize.com/portfolio/o-item/shame/)



Addendum 5 - Lead as a major threat for human health and the environment Report to G7 Ministers

Lead as a major threat for human health and the environment Report to G7 Ministers

Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States comprise the G7.

The following Communiqué was made by the G7 in 2022 ([G7 Environment Ministers 2022](#)).

G7 Workshop

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

Berlin and online, 9-10 November 2022

Report to G7 Ministers on Key Workshop Outcomes

The 2022 G7 Environment Ministers' communiqué affirmed a strong commitment to reduce lead in the environment and to reduce the disproportionate lead exposure in vulnerable communities.¹ They committed to “take stock of G7 activities and develop possible options for future work and cooperation on sources of lead to reduce lead exposure in developing countries.”

Participants of G7 members recognised that according to the World Bank's most recent assessment, the global cost of the health effects of lead exposure is estimated to be 4.6% of global GDP.¹

Delivering on this commitment, participants from G7 member states, developing countries, industry, and other relevant experts met at the workshop to discuss the results of the stocktaking exercise and identify opportunities for future work and cooperation. This document summarizes key workshop outcomes identified by participants of G7 members, which were informed by the discussions summarized in the workshop report, including possible options for future work and cooperation on lead sources to reduce lead exposure in developing countries – hereinafter referred to as Low- and Middle-Income Countries (LMICs). It also identifies areas of action to strengthen the work to minimise lead pollution and exposure globally, as well as areas of increased cooperation with existing international initiatives and instruments.

Participants of G7 members are aware of the need to act and believe that it is important to strengthen international cooperation, including with the G20, international organisations (such as UNEP, WHO, UNICEF, the World Bank and others), existing Multilateral Agreements (such as the Basel and Rotterdam Conventions) and voluntary instruments and existing international partnerships, such as the Strategic Approach to International Chemicals Management (SAICM) and the sound management of chemicals and wastes beyond 2020 instrument/framework, and the Global Alliance to Eliminate Lead Paint. They also recognize that further actions would benefit from increasing domestic inter-ministerial and inter-agency



2023 Volcano Art Prize Entry. Artist: Julia Jia

Title: Violet Frog

Lead-Safety Message: Frogs are particularly sensitive to both lead pollution and global warming so let's make our planet lead-safe and climate-safe to protect them!

School: Creative Einstein

Age: 9

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio>

[o-item/violet-frog/](https://volcanoartprize.com/portfolio-item/violet-frog/)



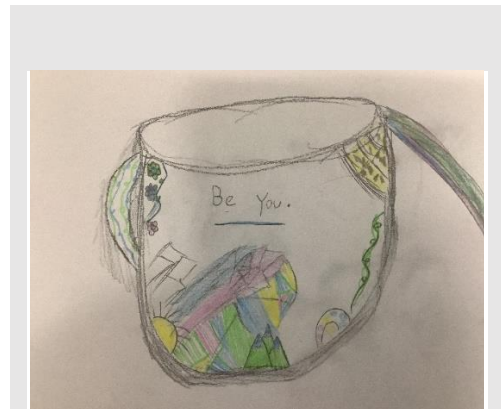
collaboration.

Participants of G7 members acknowledged that circular economy policies to improve design, reuse and safe recycling can contribute in addressing this issue.

Recognizing the issue of lead exposure as a key element of the global environmental pollution crisis, participants of G7 members identified that actions and collaboration should be strengthened to address lead poisoning in LMICs, in particular regarding vulnerable populations and children's health. These actions will contribute to reducing the economic and social costs associated with the health effects of lead exposure, considering that societal benefits of lead regulation far exceed its costs. Sharing experiences, building upon successful implemented measures and stocktaking of the actions in the future, as appropriate, would be helpful in this regard.

A shared vision of G7 work to support addressing pollution to achieve a world free of lead poisoning, could include, inter alia, the actions below:

1. Strengthen the linkages between environment, health and development officials of G7 members and LMICs to promote effective coordinated action in LMICs to reduce lead poisoning;
2. Strengthen institutional capacities in LMICs and assist them to develop, implement, and enforce domestic actions to prevent pollution and reduce lead exposure, including by setting limits on lead exposure. For example, G7 countries could assist LMICs by:
 - sharing guidance on best available techniques and best environmental practices (BAT/BEP);
 - supporting capacity building and promoting international cooperation to develop, strengthen compliance with and enforce legal requirements aimed at reducing lead exposure and preventing pollution;
 - promoting pollution prevention and management of contaminated sites including, where necessary, remediation;
 - building capacities within LMICs toward the establishment of national source inventories for lead, and implementation of BAT/BEP for reduction of these releases from sources identified during inventory development;
 - assisting in the development and implementation of best economically achievable pollution prevention practices for management and disposal of wastes containing or contaminated with lead;
3. Encourage development and uptake of safer alternatives, substitutes, and processes and substitution where alternatives are already available to reduce lead exposure in LMICs, including by providing support and information resources to artisanal and small- and medium-sized manufacturers, lead recyclers and disposal operators;
4. Increase awareness among government officials in LMICs, development assistance agencies and international organizations and institutions about the problem of lead poisoning and cost-effective solutions to reduce exposure within LMICs;
5. Support LMICs to conduct initial diagnostic assessments about the prevalence of lead poisoning and identification and ranking of relevant sources of exposure including monitoring and reporting of lead poisoning at the national level and/or at risk subgroups. To this end laboratory capacity and surveillance systems should be supported to enable systematic monitoring of blood lead levels and exposure pathways, assisted by relevant international organisations and institutions, including WHO and



2023 Volcano Art Prize Entry. Artist: Annabel Scott
Title: Be you
Lead-Safety Message: Be yourself, no matter what
School: Dutton Park State School
Age: 10
Description of Work: Pencil drawing on paper; a cup with magic flowing out to make everyone who is sad happy.

<https://volcanoartprize.com/portfolio-item/be-you/>



OECD;

6. Strengthen action by stakeholders, notably concerning prevention, including through multi-sectoral and multi-stakeholder approaches, involving academia, the health sector, industry, civil society and local universities, research institutes and national agencies to address lead exposure especially in LMICs; including by:

- Identifying and exploring ways to involve producers, industry and trade associations to exercise product stewardship and sustainable and responsible supply chain management for their products and relevant lead-contaminated articles, including through extended producer responsibility schemes;
- Developing awareness of and supporting local communities and civil society on how to advocate for policies to prevent, and to protect themselves from lead pollution via air, water, food, and soil.

7. Encourage Global Environment Facility (GEF) implementing agencies and other actors in GEF projects, together with recipient countries, to continue and strengthen work to build capacity to reduce lead poisoning from relevant sources, building on the progress achieved on lead paint under the SAICM GEF Project and taking note of the United Nations Environment Assembly Resolution 3/9 on lead-acid batteries and lead paint (UNEP/EA.3/Res.9).

8. Pursue the opportunities for bilateral cooperation to meet the priorities and needs in LMICs, in addressing lead pollution in their specific circumstances and identify areas of joint cooperation among interested G7 members for interventions in one or more LMICs, as described above.

9. Recommend to G7 Ministers to consider further discussions on the issue of lead pollution and poisoning in LMICs among the G7, where appropriate.

External link to PDF: G7 Workshop on Lead as a Major Threat for Human Health and the Environment – An Integrated Approach Strengthening Cooperation Towards Solutions

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



2023 Volcano Art Prize Entry. Artist: Tiangyang Zhao

Title: Pokemon Eevee and Pikachu
Lead-Safety Message: Let's go lead-safe and avert climate crisis so us kids can play games and enjoy our childhood!

School: Creative Einstein

Age: 11

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio>

[o-item/pokemon-eevee-and-pikachu/](https://volcanoartprize.com/portfolio/item/pokemon-eevee-and-pikachu/)



(<https://www.bundesregierung.de/resource/blob/974430/2044350/84e380088170c69e6b6ad45dbd133ef8/2022-05-27-1-climate-ministers-communicate-data.pdf?download=1>). [G7 Climate, Energy and Environment Ministers 2022]

ii Results submitted for publication and presented at the G7 Workshop by Dr. Valerie Hickey, Global Director, Environment, Natural Resources and Blue Economy of the World Bank to be published early 2023.


Prize Winning & Highly Commended Entries in Volcano Art Prize (VAP) 2023

Many thanks to our sponsor Pictureproducts, all our entrants and the VAP 2023 Judge, Monika Maszkowska! And a huge thank you to our wonderful VAP webmaster, Jimmy Yang!! Thanks also to Farrah Shabestari for adding all the Library ID (LID) numbers while data-entering the 84 entries this year into our searchable online database.



Note: this list shows the winning Volcano Art Prize (VAP) 2023 entries, in Entry Number order (see the number preceding each image below) – as they appear on the website

VAP 2023 Judge, Monika Maszkowska, judged them. Monika's high commendations and decisions on the Joint First Prize winners of the \$400 (\$200 each) cash prize, and the winners of the 30 Pictureproducts mugs from our sponsor

 , have been marked as appropriate on this list.

Due to a glitch in the Facebook Likes buttons on www.volcanoartprize.com this year, the winner of the People's Choice cash prize of \$200 is the team at University of Nairobi, Kenya, whose film entry in to VAP 2023 has been viewed hundreds of times on [YouTube](https://www.youtube.com).



Volcano Art Prize



1. LID 27623  **mug winner!**



2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Apple, Pineapple, Pear, Cherries, Orange and Watermelon

Lead-Safety Message: All these fruits will help to keep you safe from lead.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio-item/apple-pineapple-pear-cherries-orange-and-watermelon/>

2. LID 27624. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Pencil Tips

Lead-Safety Message: All artists materials should be lead-free!

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio-item/pencil-tips/>

8. LID 27439. **Highly commended and People's Choice Prize winner!**



2023 Volcano Art Prize Entry. Artist: John Spencer Onyango

Title: Anti Lead in Paint Campaign

Lead-Safety Message: Dr Faridah Were and the Chemistry Students Association of University of Nairobi work cooperatively with Basco Paints to spread the message that lead kills and lead paint must be banned in Kenya and globally.

School: University of Nairobi

URL of this short film: <https://youtu.be/QnKfHzLskY>

Description of Work: The video was taken during the 10th International Lead Poisoning Prevention Week of Action (ILPPWA) from 23rd-29th October 2022. It details the activities that took place during the week. It was focused on enhancing the efforts towards elimination of lead in paints.

<https://volcanoartprize.com/portfolio-item/anti-lead-in-paint-campaign/>

11. LID 27632  mug winner!



2023 Volcano Art Prize Entry. Artist: Joshua Fatsea

Title: Keep Red Eyed Tree Frogs Lead Safe.

Lead-Safety Message: They are threatened due to habitat destruction and degradation as they are particularly sensitive to pollution and climate change. Stop burning their Central American rainforests to grow beef!

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio-item/keep-red-eyed-tree-frogs-lead-safe/>

21. LID 27642  mug winner!



2023 Volcano Art Prize Entry. Artist: Jordan Ma

Title: Clownfish and Anemone

Lead-Safety Message: Clownfish rely on anemones for protection from predators, while anemones rely on clownfish waste for food. Every organism now relies on humans to protect them from our leaded waste.

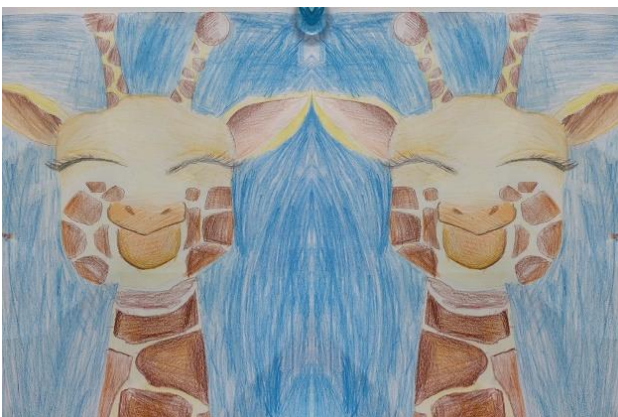
School: Creative Einstein

Age: 8

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/clownfish-and-anemone/>

22. LID 27643. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Jordan Ma

Title: Heavy Rain Downs Giraffes

Lead-Safety Message: Switch to renewable energy so giraffes don't die from parasites and disease from increasing heavy rains from climate change from burning fossil fuels!

School: Creative Einstein

Age: 8

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/heavy-rain-downs-giraffes/>



23. LID 27644  mug winner!



2023 Volcano Art Prize Entry. Artist: Azalea Manttan

Title: My Life is in Your Hands

Lead-Safety Message: Please make the world lead-safe and climate-safe by the time I grow up.

Age: 18 months

Description of Work: Hand prints with non-toxic children's paint.

<https://volcanoartprize.com/portfolio-item/my-life-is-in-your-hands/>

26. LID 27647. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Elizabeth O'Brien

Title: Vaping and Smoking Both Lead Your Health to the Gutter.

Lead Safety Message: #Grandma Lead says protect your health from lead and radioactive polonium-210 which decays to lead plus multiple other toxics by neither smoking nor vaping. Read

<https://leadsafeworld.com/vaping-lead-poisoning>

Description of Work: iPhone 8 photos collaged in Powerpoint

<https://volcanoartprize.com/portfolio-item/vaping-and-smoking-both-lead-your-health-to-the-gutter/>



28. LID 27649. **Joint First Prize and  mug winner!**



2023 Volcano Art Prize Entry. Artist: Jennifer Chuah

Title: Leaf Creates Ripples

Lead-Safety Message: Just as touching the tip of a leaf to water creates ripples, so donating to environmental health charities such as [The LEAD Group's Lead Education and Abatement Fund \(LEAF\)](https://www.leadgroup.org.uk/) promotes the global spread of lead-safety.

School: Creative Einstein

Age: 12

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/leaf-creates-ripples/>

29. LID 27650. ** mug winner!**



2023 Volcano Art Prize Entry. Artist: Jennifer Chuah

Title: Pearl Oyster

Lead-Safety Message: Pearls are made by oysters around a parasite that enters their shell. Lead is similarly encased in our bones but sadly can leach back into our blood stream later in life and cause early death.

School: Creative Einstein

Age: 12

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/pearl-oyster/>



32. LID 27653.  mug winner!



2023 Volcano Art Prize Entry. Artist: Danny Wang

Title: Sea Level Rise

Lead-Safety Message: Burning fossil fuels not only spreads Lead pollution but also raises global temperatures, melts glaciers and sea ice, raises sea levels and drowns small islands.

School: Creative Einstein

Age: 6

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/sea-level-rise/>

33. LID 27654.  mug winner!



2023 Volcano Art Prize Entry. Artist: Drishti Jonchhe

Title: Three Layer Cake

Lead-Safety Message: Not all sweets are innocent. Sugar and sweets are sometimes recalled due to lead contamination. Both lead and sugar cause tooth decay.

School: Creative Einstein

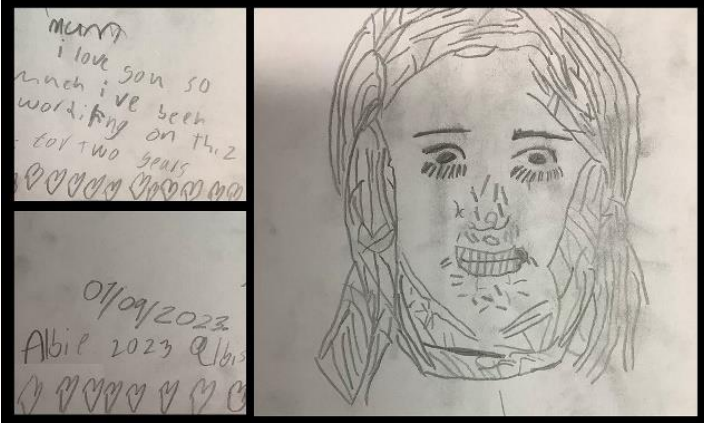
Age: 7

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/three-layer-cake/>



35. LID 27656.  mug winner!



2023 Volcano Art Prize Entry. Artist: Albie Scott

Title: Mum, I love you so much

Lead-Safety Message: Drawing with a lead free pencil, leading a lead free life

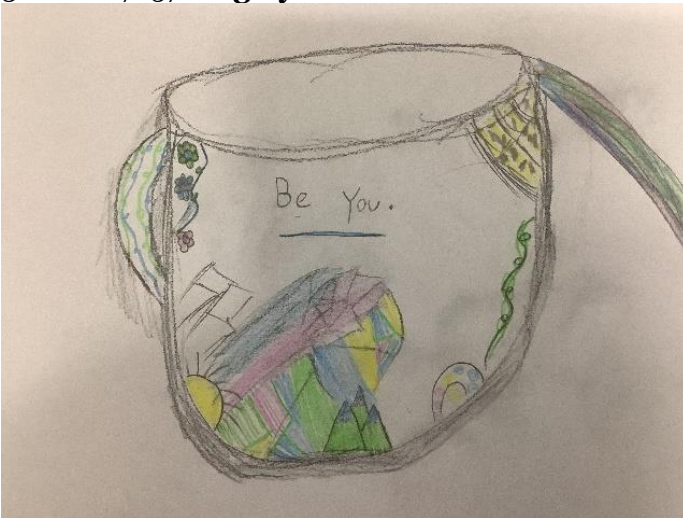
School: Dutton Park State School

Age: 10

Description of Work: Pencil drawing on paper; a portrait of Mum

<https://volcanoartprize.com/portfolio-item/mum-i-love-you-so-much/>

36. LID 27657. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Annabel Scott

Title: Be you

Lead-Safety Message: Be yourself, no matter what

School: Dutton Park State School

Age: 10

Description of Work: Pencil drawing on paper; a cup with magic flowing out to make everyone who is sad happy.

<https://volcanoartprize.com/portfolio-item/be-you/>



37. LID 27658. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Tim Pye

Title: Peebee The Elephant

Lead-Safety Message: Lead: The big, grey, dangerous, heavy element in the room. It could be your room.

Description of Work: Microsoft Powerpoint

<https://volcanoartprize.com/portfolio-item/peebee-the-elephant/>

40. LID 27661.  **mug winner!**



2023 Volcano Art Prize Entry. Artist: Claire Leight

Title: Grandma Lead in Kingaroy

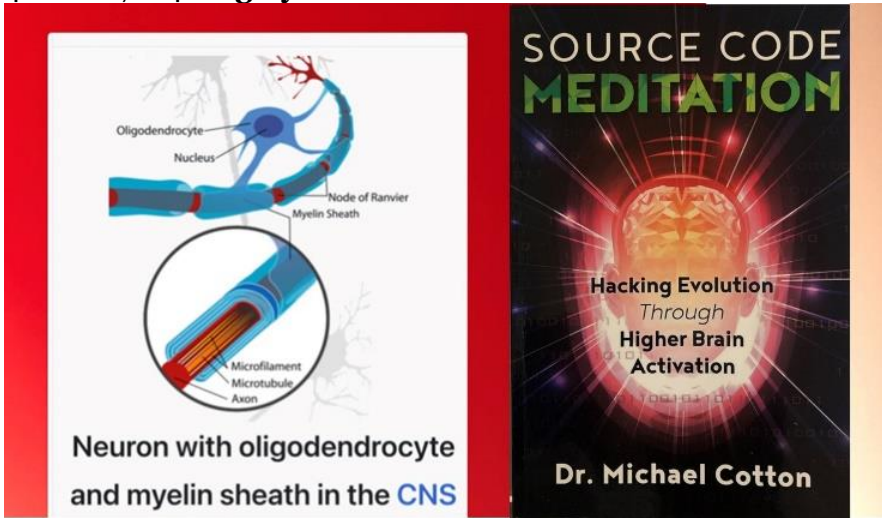
Lead-Safety Message: Grandma Lead (Elizabeth O'Brien) is proud to be a kid from Kingaroy, a co-founder of The LEAD Group and co-writer of the world's only [Model National Lead Safety Policy Proposal – Towards a Lead-Safe World!](#)

Description of Work: Photograph – Iphone

<https://volcanoartprize.com/portfolio-item/grandma-lead-in-kingaroy/>



41. LID 27664. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Elizabeth O'Brien

Title: Lead Myelin Meditation

Lead-Safety Message: Can lead-induced damage to myelin (which slows thinking and reaction time) be reversed by practicing Source Code Meditation? [Lead Safety Policy](#) proposes research!!

Description of Work: Microsoft Powerpoint collage of iPhone photos & a screenshot from <https://en.wikipedia.org/wiki/Myelin>

<https://volcanoartprize.com/portfolio-item/lead-myelin-meditation/>

42. LID 27665.  **mug winner!**



2023 Volcano Art Prize Entry. Artist: Freya Jing Feng

Title: Dragon Melissa

Lead-Safety Message: Art can help create a Lead Safe World.

School: Highgate Public School

Age: 9

Description of Work: Wood box painting

<https://volcanoartprize.com/portfolio-item/dragon-melissa/>



43. LID 27666. **Joint First Prize and  mug winner!**



2023 Volcano Art Prize Entry. Artist: Haoze (Allen) Li

Title: Habitat of sea turtles

Lead-Safety Message: If you let out lead and not put it away safely, it can destroy the safe places where sea turtles can live

School: Highgate Public School

Age: 11

Description of Work: Acrylic painting

<https://volcanoartprize.com/portfolio-item/habitat-of-sea-turtles/>

44. LID 27667.  **mug winner!**



2023 Volcano Art Prize Entry. Artist: Ella Hawkes

Title: Shame

Lead-Safety Message: The Volcano Art Prize is not just about art; it's about making the world lead-safe.

School: Merici College

Age: 16

Description of Work: Oil on canvas.

<https://volcanoartprize.com/portfolio-item/shame/>



45. LID 27668.  mug winner!



2023 Volcano Art Prize Entry. Artist: Suvana Parajuli

Title: Flamingo

Lead-Safety Message: [How many more flamingos must we lose before we do something about lead pollution?](#)

School: Creative Einstein

Age: 11

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/flamingo-2/>

48. LID 27671.  mug winner!



2023 Volcano Art Prize Entry. Artist: Christopher Nguyen

Title: Orange Dragon

Lead-Safety Message: Dragons and volcanoes should be the only natural smoke producers, let's not be one too.

School: Creative Einstein

Age: 11

Description of Work: Non-toxic colour pencils on paper

<https://volcanoartprize.com/portfolio-item/orange-dragon/>



49. LID 27672.  mug winner!



2023 Volcano Art Prize Entry. Artist: Christopher Nguyen

Title: Jellyfish

Lead-Safety Message: Some jellyfish can excrete most of the lead they absorb but will die if the water goes above 33 degrees Celsius. We must stop global warming and protect ocean ecosystems!

School: Creative Einstein

Age: 11

Description of Work: Non-toxic colour pencils on paper

<https://volcanoartprize.com/portfolio-item/jellyfish/>

51. LID 27674. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Rohan Calvert

Title: Lead Safe Rooftop

Lead-Safety Message: [Men in White](http://www.meninwhite.com.au) organised degraded lead-painted fascia component replacement, then lead-safely stripped red lead paint from the gable end and painted all with non-lead paint. Next step: plumber to replace lead flashing with non-lead Colorbond flashing.

Description of Work: Powerpoint collage of 7 photos & logo from www.meninwhite.com.au

<https://volcanoartprize.com/portfolio-item/lead-safe-rooftop/>



52. LID 27675.  mug winner!



2023 Volcano Art Prize Entry. Artist: Edison Nguyen

Title: Cherries

Lead-Safety Message: Grapes grown on a trellis and tree fruits like cherries generally don't uptake lead from the soil, but dust or soil that gets on the fruit should be washed off before using. Eating cherries is way better than interacting with lead!

School: Creative Einstein

Age: 11

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/cherries-2/>

56. LID 27679.  mug winner!



2023 Volcano Art Prize Entry. Artist: Edison Nguyen

Title: Dragon

Lead-Safety Message: If you ever buy a metal miniature Dragon to paint, make sure the paints and the metal are lead-free.

School: Creative Einstein

Age: 11

Description of Work: "Lead" (actually lead-free graphite) coloured pencils on paper. Lead Safety Message from <https://lead.org.au/q&a/2006/20061102001.html>

<https://volcanoartprize.com/portfolio-item/dragon/>



57. LID 27680.  mug winner!



2023 Volcano Art Prize Entry. Artist: Alex Jewson

Title: #GrandmaLead and Grandson

Lead Safety Message: Children look to us to invest in what's important: Children's intelligence, lead-safety, climate-safety, time together meditating while on your favourite "whale rock".

Description of work: Mobile phone photo.

<https://volcanoartprize.com/portfolio-item/grandmalead-and-grandson/>

58. LID 27681. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Elizabeth O'Brien

Title: Research Lead Detox

Lead Safety Message: As we age, we can stop taking in new lead, keep our brains and bodies active, meditate, eat local, grow and prepare our own lead detox foods, take detox supplements and look after the planet in other ways, but to avert a climate crisis, we also need researchers to investigate what definitely removes lead from our brains and bodies so we can do that too!

Description of Work: Powerpoint collage of photos around a screenshot from [Dr Michael Cotton's Source Code Meditation \(SCM\) The 9 Summits of Transformation Online Course](#).

<https://volcanoartprize.com/portfolio-item/research-lead-detox/>



59. LID 27682. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Elizabeth O'Brien

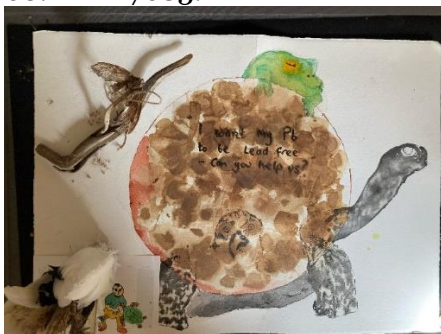
Title: Stop New NSW Lead Mines

Lead Safety Message: I have a vision that the [2023 NSW Parliamentary Inquiry into whether the NSW regulatory framework for heavy metals and critical minerals mining is fit for purpose](#), will not only stop Bowdens and other proposed lead mines, but will find that no new lead mines in NSW can be justified! Let's use recycled lead (eg using government rebates to remove and recycle lead roof flashing so lead-safe rainwater can be collected) instead for our renewable energy projects!

Description of Work: Powerpoint collage of screenshots from [Communities anxious as NSW government spruiks mining, The 7.30 Report, 20 Sept 2023, ABC TV \(on Youtube\)](#)

<https://volcanoartprize.com/portfolio-item/stop-new-nsw-lead-mines/>

60. LID 27683.  **mug winner!**



2023 Volcano Art Prize Entry. Artist: Siobhan Hannigan

Title: Help

Lead Safety Message: "I want my Pb to be lead free. Can you help us?"

Description of Work: Mixed media ink watercolour teabags and found objects.

<https://volcanoartprize.com/portfolio-item/help/>



61. LID 27684.  **mug winner!**



2023 Volcano Art Prize Entry. Artist: Joshua Quarters

Title: Penguin Pair

Lead-Safety Message: Heavy metals like lead (eg from contaminated stormwater entering the ocean) bioaccumulate in penguins then biomagnify in their predators.

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/penguin-pair/>

63. LID 27586. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Julia Jia

Title: Spreadable Lead Sunset Clause

Lead-Safety Message: To protect our air, land, rivers and oceans from spreadable lead, the world needs to ban all leaded products that are easily dispersed. For example lead sinkers, ammunition, weights and old style lead acid batteries that leak.

School: Creative Einstein

Age: 9

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/spreadable-lead-sunset-clause/>

65. LID 27688.  **mug winner!**



2023 Volcano Art Prize Entry. Artist: Julia Jia

Title: Violet Frog

Lead-Safety Message: Frogs are particularly sensitive to both lead pollution and global warming so let's make our planet lead-safe and climate-safe to protect them!

School: Creative Einstein

Age: 9

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/violet-frog/>

68. LID 27691.  **mug winner!**



2023 Volcano Art Prize Entry. Artist: Tiangyang Zhao

Title: Pokemon Eevee and Pikachu

Lead-Safety Message: Let's go lead-safe and avert climate crisis so us kids can play games and enjoy our childhood!

School: Creative Einstein

Age: 11

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/pokemon-eevee-and-pikachu/>



70. LID 27693.  mug winner!



2023 Volcano Art Prize Entry. Artist: Rishab Vohra

Title: Moon High Tide Flooding

Lead-Safety Message: By the time I turn 21, NASA predicts that if we let climate change continue to raise sea levels, the moon's tilt cycle will increase high tide flooding in all coastal communities. Please make the world lead-safe now to increase brainpower so we can avert climate crisis!

School: Creative Einstein

Age: 9

Description of Work: Colouring pencils on paper. Lead Safety Message from "[The moon's natural wobble alters Earth's tides. With climate change, that's bad news](#)" by Denise Chow, ABC News USA, July 16, 2021.

<https://volcanoartprize.com/portfolio-item/moon-high-tide-flooding/>

72. LID 27695.  mug winner!



2023 Volcano Art Prize Entry. Artist: Mia Chau

Title: Pandas

Lead-Safety Message: Just like pandas are black and white... with lead-safety and climate-safety you're either part of the problem or part of the solution!

School: Creative Einstein

Age: 6

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/pandas/>



74. LID 27697.  mug winner!



2023 Volcano Art Prize Entry. Artist: Suvana Parajuli

Title: Burnt Bush

Lead-Safety Message: Trees take up lead from the soil which is why oil, coal and gas contain lead. If we stop burning fossil fuels to stop climate change, we'll have fewer bushfires releasing that lead as smoke and ash!

School: Creative Einstein

Age: 11

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/burnt-bush/>

75. LID 27698.  mug winner!



2023 Volcano Art Prize Entry. Artists: Jayne Bentivoglio and Jo Miskle

Title: NSW Parliament House Protest

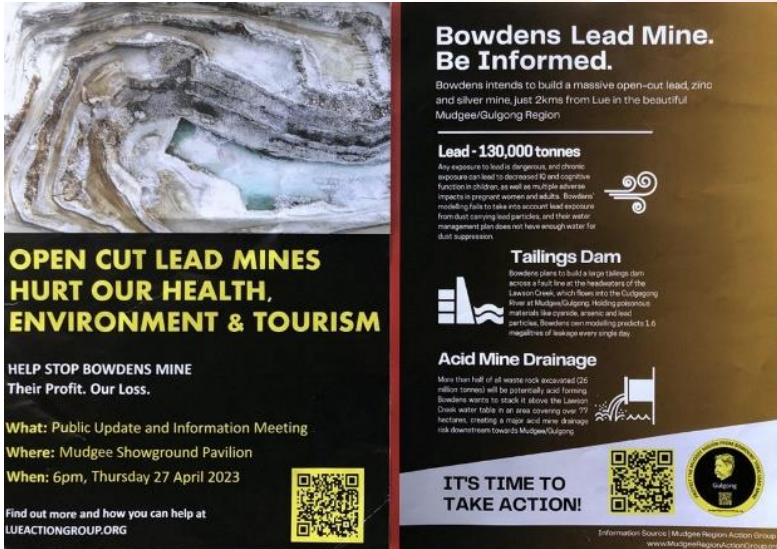
Lead-Safety Message: Our health, water, air, land and tourism are under threat! Protect Mudgee Region from toxic metal mining! Protect our greenfield agriculture! Lead poisoning is forever!

Description of Work: iPhone photos of protesters from Mudgee Region Health Alliance and Mudgee Region Action Group during International Lead Poisoning Prevention Week of Action 2023.

<https://volcanoartprize.com/portfolio-item/nsw-parliament-house-protest/>



76. LID 27699. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Mudgee Region Action Group

Title: Stop Bowdens Lead Mine

Lead-Safety Message: Open cut lead mines hurt our health, environment and tourism. Help stop Bowdens mine. Bowdens intends to mine 130,000 tonnes of lead and build a large tailings dam across a fault line potentially creating a major acid mine drainage risk downstream. It's time to take action!

Description of Work: Scanned flyers collaged together in Powerpoint.

<https://volcanoartprize.com/portfolio-item/stop-bowdens-lead-mine/>

77. LID 27700.  **mug winner!**



2023 Volcano Art Prize Entry. Artist: Mavis Zhou

Title: Black Birds On Black Trees

Lead-Safety Message: Many birds and other wildlife starve after Australia's bushfires which are now more extensive, more frequent and increasingly burn all night due to climate change-induced hot dry periods. Indigenous fire management practices and renewable energy farms are needed urgently.

School: Creative Einstein

Age: 6

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/black-birds-on-black-trees/>



78. LID 27701.  mug winner!



2023 Volcano Art Prize Entry. Artist: Devrim Yasar

Title: Moonlit Killer Whale

Lead-Safety Message: Keep lead out of the ocean and stop global sea temperature rising by switching from burning fuel – even unleaded fuel contains trace amounts of lead – to renewable energy so apex predators like killer whales can continue to thrive.

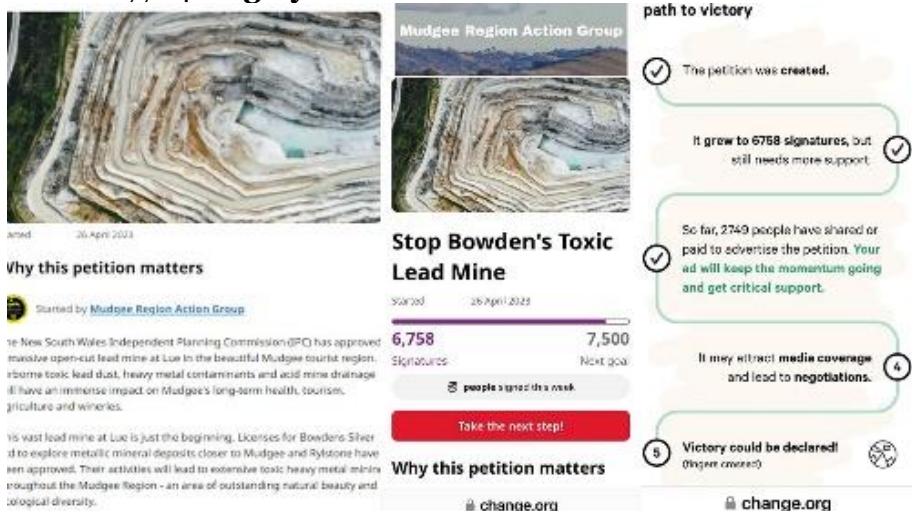
School: Creative Einstein

Age: 9

Description of Work: Colouring pencils on paper

<https://volcanoartprize.com/portfolio-item/moonlit-killer-whale/>

81. LID 27704. **Highly commended!**



The screenshot shows a Change.org petition page titled "Stop Bowden's Toxic Lead Mine" created by the Mudgee Region Action Group. The petition has 6,758 signatures and a goal of 7,500. A "path to victory" infographic on the right shows five steps: 1. The petition was created. 2. It grew to 6758 signatures, but still needs more support. 3. So far, 2749 people have shared or paid to advertise the petition. Your ad will keep the momentum going and get critical support. 4. It may attract media coverage and lead to negotiations. 5. Victory could be declared! (finger crossed)

2023 Volcano Art Prize Entry. Artist: Mudgee Region Action Group

Title: Stop Bowdens Toxic Lead Mine

Lead-Safety Message: It's time for you dear readers to take action and sign the petition at <https://www.change.org/p/help-stop-bowden-s-toxic-lead-mine>! This could be the first of many lead mine and lead mine expansions to be stopped by wonderful people like you who are creating a lead-safe world for our children!

Description of Work: Screenshots from [Petition · Stop Bowden's Toxic Lead Mine · Change.org](https://www.change.org/p/help-stop-bowden-s-toxic-lead-mine) collaged together in Powerpoint.

<https://volcanoartprize.com/portfolio-item/stop-bowdens-toxic-lead-mine/>



82. LID 27705. **Highly commended!**

Rural communities feeling anxious as NSW government pursues Critical Minerals Strategy



Australia's beef, sheep and olive exports could be ruined if lead mine is built in New South Wales, inquiry told

ABC Central West / By Joanna Woodburn
Posted Wed 4 Oct 2023 at 3:27pm

Chair of NSW parliamentary inquiry into impacts of metal mining on human health flags integrity concerns



2023 Volcano Art Prize Entry. Artist: The LEAD Group

Title: Orange Mudgee Mine News

Lead-Safety Message: ABC News reporters Joanna Woodburn and Micaela Hambrett have done an awesome job in 2023 reporting on acid mine drainage from the former Sunny Corner mine, and lead contamination and potential future lead hazards from Cadia Lead Mine near Orange and the proposed Bowdens Silver Mine at Mudgee.

Description of Work: Collaged screenshots from [Australia's beef, sheep and olive exports could be ruined if lead mine is built in New South Wales, inquiry told - ABC News](#); [Rural communities feeling anxious as NSW government pursues Critical Minerals Strategy - ABC News](#); [Chair of NSW parliamentary inquiry into impacts of metal mining on human health flags integrity concerns - ABC News](#); [NSW parliamentary inquiry submissions warn of lead, gold, silver, zinc mining impacts - ABC News](#)

<https://volcanoartprize.com/portfolio-item/orange-mudgee-mine-news/>

83. LID 27706. **Highly commended!**



2023 Volcano Art Prize Entry. Artist: Justine Cooney

Title: I Want a Lead Safe Future

Lead-Safety Message: I want a future in which people care about each other, and as a society regulate to protect people, particularly the vulnerable like children, from known and preventable dangers such as lead poisoning.

Description of Work: iPhone photo.

<https://volcanoartprize.com/portfolio-item/i-want-a-lead-safe-future/>



84. LID 27707.  **mug winner!**



2023 Volcano Art Prize Entry. Artist: Kiana Parsyar

Title: Fruits And Tea

Lead-Safety Message: Fruits and tea are high in antioxidants and help detox lead poisoning. Persians love tea and put handmade carpets everywhere even under our tea cup!

School: St Anthony's Catholic Primary School

Age: 9

Description of Work: Watercolour

<https://volcanoartprize.com/portfolio-item/fruits-and-tea/>

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