



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](#)).

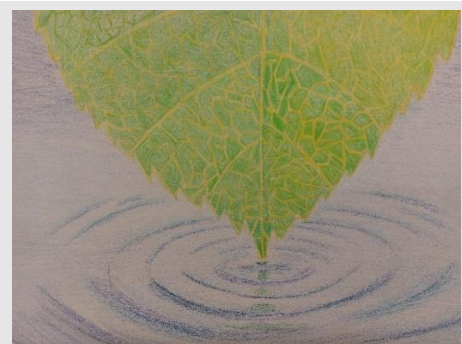
Some examples of Primary Prevention of Lead Exposure are:

- 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, fetuses 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.

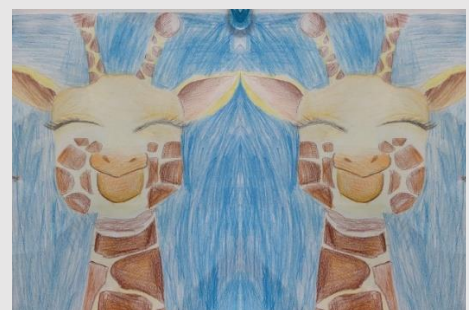
Primary Lead Exposure Prevention policies will include requiring the removal of leaded paint that is already in poor condition on surfaces in all government-controlled facilities for children and public housing with occupants who are children.

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>



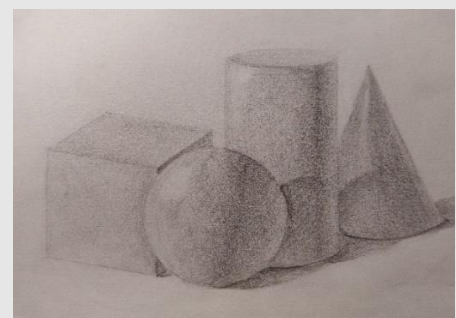
groups

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

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