

# 1. Sources

Lead is a toxic metal that occurs naturally in the Earth's crust. It may exist in both inorganic and organic forms. The current global uses of lead are in batteries, rolled and extruded products, pigments and other product additives (e.g. for paints, cathode ray tubes, enamels and ceramics, PVC stabilisers), ammunition, alloys, cable sheathing and other uses.



# 2. Why is it relevant?

Lead is a multi-system toxicant for which no safe level of exposure has been identified. It has a ubiquitous presence in the environment. Wildlife and humans may be continually exposed to lead once it is released via contaminated air, water, soil and foodstuffs (including herbal products and medicine).



Lead has been identified as one of the 10 chemicals of major public health concern by the World Health Organization and as an issue with emerging evidence of risks to human health by the Global Chemicals Outlook II.



Exposure to lead can cause chronic and debilitating health impacts in all age groups, and children are particularly vulnerable to its neurotoxic effects.



Inorganic lead compounds have been classified as "probably carcinogenic" to humans, while there is sufficient evidence of carcinogenicity in experimental animals.



Other health effects of exposure to lead include hypertension, renal failure, cardiovascular disease and stroke, especially among workers. Adverse effects of lead on the ecosystem have also been observed.

Exposure to lead and lead compounds may occur from natural and anthropogenic sources. Releases from anthropogenic sources of lead substantially surpassed natural sources long ago.



Lead and lead compounds persist in the environment in different forms. They may exhibit different environmental fate and transport characteristics depending on their forms.

Anthropogenic releases include fossil fuel and coal combustion, mining and smelting of metals, and sources related to the production, use, disposal and recycling lead and lead related products.



Wildlife and humans may be exposed to lead via contaminated air, water, soil, foodstuffs and lead related products.

Once emitted to air, inorganic lead compounds exist mainly in the particulate form and can be transported by wind, in some cases up to thousands of kilometres far away from sources.



Lead can enter the food chain through crops growing on contaminated land, from direct deposition onto crops, through food animals and fish living in lead-contaminated environments.

Workers may further be exposed through inhalation of lead particles, for example, during smelting and recycling.



### 3. Existing instruments and actions

At the international level, in addition to the focus on lead paint, actions have focused on lead and lead compounds in petrol, batteries, ammunition and wastes, while some resolutions also referred to the wider sources of lead exposure (e.g. Johannesburg Plan of Implementation; UNEA Resolution 3/9). Among these areas, the phase-out of leaded petrol is the most successful one.

For lead in batteries, ammunition and wastes, international efforts are ongoing. Most importantly, lead-containing wastes including waste lead-acid batteries have been included as hazardous wastes under the Basel Convention.

Resolutions and recommendations have been adopted at other international forums with regard to environmentally sound management of waste lead-acid batteries and phase-out of lead ammunition for hunting and fishing. Efforts have also been taken to assist countries in taking actions, e.g. the development of guidance documents and tools.

National and regional instruments and actions have been more diverse both in terms of types and their respective scopes. Many countries and regions have taken actions to legally restrict or ban lead in a wide variety of specific uses that may go beyond those that are being addressed at a global scale.

A large number of countries have looked at releases from anthropogenic sources and exposure media that are not lead-specific, and some countries have set up guideline values for different exposure media that are either legally binding or as recommended guidance values.



### 4. Challenges and opportunities



The dangers of lead and lead compounds have been known for over a century. Scientific evidence continues to show no safe levels of lead exposure for children and that very low levels of lead can cause severe adverse health effects at all ages.

This knowledge has, for example, led to considerable international and national efforts to virtually eliminate leaded petrol worldwide. However, efforts to date are likely to be inadequate to eliminate or minimise lead exposures from other anthropogenic sources.

Considering the successful story of the global phase-out of leaded petrol, the international community as a whole can step up action to address lead exposure in a much more comprehensive manner. This message has been reiterated many times at different international forums since the World Summit of Sustainable Development in 2002.

Action needs to be taken not only to address sources that may result in exposure far away from the original sources through long-range transport via air, but also with regard to sources for which exposure may occur only locally or regionally.

Much can be learned from the global sound management of arsenic, cadmium and mercury. These elements can be successfully addressed with international actions.

