

Better Health. Better Environment. Sustainable Choices.

Fact sheet 5

Chemical Safety

The importance of preventing early-life exposure to hazardous chemicals

Summary

Chemicals are essential for economic development and well-being; however, through their unsound management, they can pose risks to human health. The evidence is growing that hazardous chemicals contribute to disease and dysfunction across the life-course, and to the increased prevalence and incidence of chronic health conditions including: cancer; respiratory, urinary-system and cardiovascular diseases; allergies; neurodevelopmental and congenital defects; and endocrine disruption. Investment in protection from exposure to toxic chemicals in early childhood is one of the most cost-effective policy choices available to governments, leading to the decrease of non-communicable diseases and increase in quality of life.



Introduction

The range of chemicals affecting human health is wide and growing. Chemical production and consumption in the WHO European Region has the highest figures in the world: 11 of the top 30 major chemical-producing countries are European, generating chemical sales of €533 billion. These include hazardous chemicals, such as heavy metals and some persistent and non-persistent organic pollutants – for which toxicity to humans is well-established – as well as emerging chemicals, all of which cause public health concern.

Globally, 1.3 million lives and 43 million disability-adjusted life-years (DALYs) were lost in 2012, as a result of exposure to selected chemicals, the health effects of which are well estimated. In Europe, mercury pollution exacts a toll of €5.1 billion/year, while a broader estimate of childhood medical and physiological conditions, resulting from chemical hazards, suggests the costs in the order of €71 billion/year. A recent analysis estimated the costs of the burden of disease attributable to endocrine-disrupting chemicals (EDCs) at €163 billion/year.



Despite substantial progress in chemicals regulation, urgent actions are needed to protect children at early stages of development, to improve population health throughout the life-course.

Key messages

- ▶ New, consistent and complementary findings from scientific research in genetics, epidemiology, psychology, neuroscience, and economics confirm that exposure to chemicals is a meaningful factor influencing the developmental origins of health and disease.
- ▶ Chemical stressors, during intrauterine development, play an important role in determining functional development and future disease risks. Therefore, preventive actions must focus on preconception, pregnancy, early childhood.
- ▶ It is crucial that policy-makers: gain an understanding, and accept the benefits, of sound chemicals management for human health, and its contribution to the prevention of non-communicable diseases; and give it priority.
- ▶ Preventive action can deliver large economic benefits to society. As a result of the United Nations Environment Programme (UNEP)/WHO leadership of a global alliance aimed at eliminating lead in paint, global benefits have been calculated at US\$1–6 trillion/year, with the best estimate of US\$ 2.45 trillion/year, or 4% of global gross domestic product (GDP).

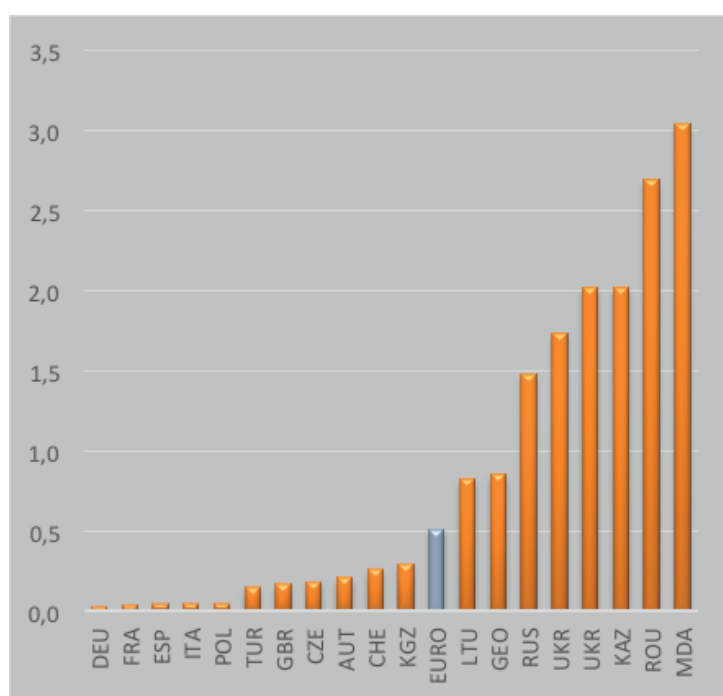


Figure 1:

Average mortality rate from unintentional poisoning in Europe, 2009–2014 (Deaths per 100 000 population)

Source: Elaboration based on data from the European Health Information Gateway: Health For All Explorer [website]. Copenhagen: WHO Regional Office for Europe (<https://gateway.euro.who.int/en/hfa-explorer/>, accessed 20 May 2017).

Key Facts

- ▶ Children are more vulnerable to the effects of exposure to chemicals and cannot protect their rights to living in a safer environment. Fifty-four percent of the global burden of disease attributable to environmental exposures, expressed in DALYs, is borne by children under the age of 15 years.
- ▶ Children are exposed to chemicals every day and throughout the life-course. Chemicals can enter the food chain and consumer products, contribute to exposure, and impact health. Chemicals can undergo complex interactions in case of multiple exposures, as it has been shown for endocrine-disrupting chemicals.
- ▶ Worldwide, unintentional poisonings are estimated to cause 193 000 deaths annually, the majority of which are children (see Fig 1). The burden of disease, attributable to chemicals, has been estimated for only a few types of chemical exposures, and is underestimated due to a lack of scientific evidence and data.



- Recognition is growing of the profound and long-lasting effects of exposure to toxic, environmental agents in early life, which can lead to adult-onset diseases later in life, and can even, as in the case of exposure to some chemicals at the critical life stages, have impacts that manifest themselves across generations.
- An increasing number of human studies have confirmed the effects of chemicals on the developing brain, respiratory health later in life, endocrine-related disorders, obesity, diabetes and other metabolic disorders. A conservative estimate of the economic costs associated with obesity attributable to chemicals in the European Union is around €18 billion/year.

“Best buys”

- To ensure progress in the prevention of exposure to hazardous chemicals at early development stages, several priority actions should be taken at the national and regional level.
- *To recognize the specific needs of children and the needs for protection at the early development stages, and to place the health-related aspects of chemicals at the top of the political, health, and environment agendas:*
 - Protect vulnerable groups against the detrimental effects of chemicals on health. This is particularly challenging due to the physiological, behavioural, social and other characteristics of vulnerable groups. Paying specific attention to their needs is critical for public health.
 - Global and regional policies create a momentum for raising awareness and accelerating actions towards prevention of the health impacts of chemicals.
 - Chemicals are a focus of the United Nations 2030 Sustainable Development Agenda. Sound chemicals management can contribute to the implementation of many, if not all, SDGs.
 - A WHO road map on the enhancement of health sector engagement in the Strategic Approach to International Chemicals Management (SAICM), towards the 2020 goal and beyond, has been supported by all WHO Member States.
 - Chemical safety will contribute to making progress in all priority action areas of Health 2020, the European policy for health and well-being.
 - The Minsk Declaration on the life-course approach in the context of Health 2020 encourages the Member States of the WHO European Region to pay specific attention to the protection of early childhood from hazardous chemicals.
- *To develop and implement risk-reduction policy and action focusing on the prevention of early-life exposure to chemicals:*
 - The development of risk-reduction policy is an initial but very important step towards the protection of vulnerable populations. Key principles, such as precaution, prevention, inter-generational equity, internalization of costs, the right to know and public involvement, should form the basis for the planning of risk-reduction measures and ensuring their implementation.



Figure 2:
Teaching students about lead in paints
Source: Nana Gabriadze, Georgia



- ▶ Risk-reduction policies should consider and include the: promotion of safer, non-hazardous alternatives and phasing-out of toxic products; introduction of special measures to protect pregnant women and children, and the creation of stricter safety requirements for consumer products used by these population groups; building of capacities needed for the effective implementation of policies, and; collection and sharing of information with relevant stakeholders, including individuals. Policy should be aligned with other actions being taken in the chemicals and public health areas.
- ▶ *To establish effective mechanisms for a whole-of-society and whole-of-government approach to chemicals management and ensure the strong involvement of the health sector:*
 - Sound chemicals management and public health are both multi-sectoral issues. International legally binding and voluntary agreements, such as the Stockholm Convention, Rotterdam Convention, Minamata Convention on Mercury, Strategic Approach to International Chemicals Management (SAICM), and Health 2020, highlight the crucial role of all involved stakeholders at the local, national, regional and global levels.
 - In advocating for human health, and based on the knowledge of the health effects of chemicals, the health sector needs to be strongly involved in all stages of the chemicals life-cycle. A mandate to this end should clearly involve all relevant national stakeholders, including industry and the public, in the protection of vulnerable populations.

The other key areas to be addressed in order to prevent early-life exposure to chemicals:

- Establish mechanisms for the collection of information necessary for the assessment of chemical risks, share such information with all stakeholders, and raise their awareness about chemicals and their health effects. National programs for the biomonitoring of human exposure to hazardous chemicals should be considered the main instruments for assessing exposure and as the basis for public health decisions about prevention.
- Build national infrastructure capacities, and provide sustainable access to financial resources, to meet national needs in all sectors involved in the protection of vulnerable population groups from the negative impact of chemicals.
- In conclusion, further scientific research is required to collect the evidence, identify safer alternatives and recommend the most effective preventive measures.

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