

# Children and poisoning



## What is poisoning?

Poisoning is when cells are injured or destroyed by the inhalation, ingestion, injection or absorption of a toxic substance. Key factors that predict the severity and outcome of poisoning are the nature, dose, formulation and route of exposure of the poison; co-exposure to other poisons; state of nutrition of the child or (fasting status); age and pre-existing health conditions.

Children are curious and explore their world with all their senses, including taste. As a result, the home and its surroundings can be a dangerous place when poisonous substances are inadvertently ingested – every year millions of calls are made to poison control centres when this happens and thousands of children are admitted to emergency departments. Poisoning patterns change according to age group, type of exposure and the nature and dose of the poison.

## Scale of the problem

### Mortality

- In 2004, acute poisoning caused more than 45 000 deaths in children and youth under 20 years of age – 13% of all fatal accidental poisonings worldwide.
- In 16 high-income and middle-income countries, poisoning is the fourth biggest cause of unintentional injury after road traffic injuries, fires and drowning.
- The rate of fatal poisoning is highest for children under one year, with another slight peak around 15 years.
- Fatal poisoning rates in low-income and middle-income countries are four times that of high-income countries.
- Africa and low-income and middle-income countries in Europe and the Western Pacific Regions have the highest rates.
- Common poisoning agents in high-income countries include pharmaceuticals, household products (e.g. bleach, cleaning agents), pesticides, poisonous plants and bites from insects and animals.
- Common poisoning agents in low-income and middle-income countries are fuels such as paraffin and kerosene, pharmaceuticals and cleaning agents.

Fatal child poisoning rates per 100 000 population<sup>a</sup> by WHO region and country income level, 2004

Africa		Americas		South-East Asia	Europe		Eastern Mediterranean		Western Pacific	
LMIC	HIC	LMIC	LMIC	LMIC	HIC	LMIC	HIC	LMIC	HIC	LMIC
4.0	0.8	0.3	1.7	0.2	2.0	0.7	1.6	0.1	1.8	

<sup>a</sup> These data refer to those under 20 years of age.  
HIC = High-income countries;  
LMIC = Low-income and middle-income countries.  
Source: WHO (2008), *Global Burden of Disease: 2004 update*.

### Morbidity

- Poisoning morbidity is a significant problem but global data are not available and regional data are not comparable because of differing access to services and hospital admission criteria.
- In some countries poisoning death rates are highest in children under one year, while non-fatal poisonings appear to be more common among children aged 1 to 4.
- Studies from both low-income and high-income countries suggest that poisonings and their management are costly. For example, a study conducted in South Africa estimated that the direct costs of hospitalization because of paraffin poisoning alone are at least US\$ 1.4 million per year.

## Risk factors

- Young children are particularly susceptible to the ingestion of poisons, especially liquids, because they are very inquisitive, put most items in their mouths and are unaware of consequences.
- Adolescents, on the other hand, are more aware of the consequences of their actions but peer pressure and risk-taking behaviour can lead them to misuse alcohol or illicit drugs, leading to a fatality rate higher than in younger children.
- Younger children are more susceptible to poisoning because of their smaller size and less well-developed physiology, particularly as the toxicity of most substances relates to dose per kilogram of bodyweight.

### Most common agents involved in childhood poisoning:

- Over-the-counter preparations such as paracetamol, cough/cold remedies, vitamins and iron tablets, antihistamines and anti-inflammatory drugs.
- Prescription medications such as antidepressants, narcotics, analgesics and illicit drugs.
- Household products such as bleach, disinfectants, detergents, cleaning agents, cosmetics, vinegar.
- Paraffin/kerosene.
- Pesticides, including insecticides, rodenticides and herbicides.
- Poisonous plants.
- Animal or insect bites.

- Boys have higher rates of poisoning than girls in all regions of the world, probably because of differences in socialization.
- Fatal and non-fatal poisonings are strongly associated with lower socioeconomic status, between and within countries.
- The prevalence and types of poisoning vary in different parts of the world. They depend on industrial development, agricultural activities, cultural practices relating to supervision of children and local beliefs and customs. For example, medicinal drugs are the leading cause of non-fatal poisoning in children in middle-income to high-income countries, and ingestion of fuels such as kerosene is a common cause in low-income countries.
- Other risk factors for poisoning include those related to the poisoning agent itself, including toxicity, nature, physical appearance and storage; season and weather conditions; policies, standards and laws governing the manufacture, labelling, distribution, storage and disposal of poisoning agents; and access to quality health care for treatment.

## Interventions

Poisoning can be reduced through the use of effective prevention strategies.

### Proven effective approaches to reducing poisoning —

- ✓ Removing the poisoning agent from the environment (e.g. removal of poisonous plants; removal of fuel sources such as bottled kerosene).
- ✓ Reducing toxicity of poisoning agents by packaging in non-lethal concentrations or doses.
- ✓ Replacing the poisoning agent with one of lower toxicity (e.g. replacing aspirin with paracetamol; reformulating methylated spirits to include ethyl alcohol rather than methanol).
- ✓ Establishing a poison control centre to triage poisonings, dispensing accurate and timely advice to caregivers and health facilities, directing first aid where appropriate, and referring more severe poisonings to treatment at a health facility.
- ✓ Legislation (and enforcement) of child-resistant packaging of necessary poisonous agents (e.g. medicines, household chemicals and other toxins).

### What does not work?

- ✗ There is insufficient evidence to promote the regulation or removal of toxic substances that are easily mistaken for edible items, or reducing the attractiveness or labelling of toxic products.
- ✗ The introduction of non-standardized, non-reclosable or blister packaging for tablets has the potential to be harmful as these may not be child-resistant.

**“All things are poison and nothing is without poison, only the dose permits something not to be poisonous.”**

*Paracelsus  
Encyclopaedia Britannica*