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## Injuries and poisoning in children

Unintentional injuries are emerging as an important, largely preventable, growing public health problem in children in developing countries: the Eastern Mediterranean Region has the second highest estimated mortality rate in children under-five per 100 000 population in the world, after the African region.

Together with road traffic injuries, drowning, burns and falls, poisoning is a major contributor to the burden of injury in children. In the group under 20 years old, children under-five have the highest mortality rates related to unintentional poisoning per 100 000 population in the Eastern Mediterranean Region. While children under the age of one year have the highest rates of fatal poisoning, non-fatal poisoning is more common in the age group 1 to 4 years old.

Exposures occur much more frequently in children below 5 years old than older children, because of their curiosity to explore the environment and tendency to put things in their mouth, their unawareness of the risks, and play patterns. Data on morbidity are often limited to those collected at poison control centres. It is expected that for every death from injury in children, a substantial number of non-fatal injuries, outpatient visits and hospital admissions are likely to occur.

[World report on child injury prevention](#)

[The Injury Chartbook](#)

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## Research on poisoning in children

The Regional office for the Eastern Mediterranean has coordinated initial research work on poisoning in children to develop standard clinical guidelines for the outpatient management of children with poisoning at primary health care facilities.

organophosphates / carbamates, and hydrocarbons Work has focused on poisoning from

Rationale

Among acute poisonings in children, unintentional exposure to hydrocarbons—especially kerosene—is frequently reported. Organophosphates and carbamates are among the most frequently used insecticides, and children under-five account for a large proportion of acute, unintentional poisonings from these agents.

Children are more vulnerable to the effects of pesticides and may absorb relatively more chemical due to their larger surface area to body weight ratio. Thus, a smaller dose is required to cause symptoms in children than in adults.

Children often need to be admitted and managed as inpatients. There is lack of clinical algorithms for use in settings with limited resources to identify children who are likely to have a more severe outcome based only on few clinical signs and symptoms.

#### Derivation of the clinical algorithm

The Regional office has collaborated in two prospective studies conducted to identify clinical predictors of severity of unintentional poisoning from hydrocarbons and organophosphates, respectively, in children below five years of age.

The studies have identified three clinical signs in children exposed to hydrocarbons (sensitivity 98% and specificity 42%) and two clinical signs in children exposed to organophosphates / carbamates (sensitivity 100% and specificity 77%) that, if present within two hours of exposure, may help differentiate between children requiring higher level resources (referral) from those not requiring them. These findings need validation.

The studies were carried out at the Poison Control Centre of Ain Shams University Hospitals, Cairo, Egypt, in 2004-2005. The samples included 256 children under-five with exposure to hydrocarbons and 95 children under-five with exposure to organophosphates and carbamates, respectively.

The results of the hydrocarbon study "A clinical decision rule for triage of children under 5 years of age with hydrocarbon (kerosene) aspiration in developing countries", by the WHO EMRO Pediatric Hydrocarbon Study Group, have been published in *Clinical Toxicology*, Volume 46, Issue 3 March 2008, pages 222 – 229.

The results of the organophosphate / carbamate study "A clinical decision aid for triage of children under five years of age with organophosphate or carbamate insecticide exposure in developing countries", by the WHO EMRO Pediatric Insecticide Study Group have been published in the *Annals of Emergency Medicine*, Volume 52, Issue 6, December 2008, pages 617-622.

#### Validation of the clinical algorithm

The clinical algorithms derived in the Egypt study need to be validated prospectively in other settings in other countries with a different prevalence and spectrum of the poisoning conditions.

A pilot validation study on the clinical algorithm on hydrocarbon poisoning is currently being conducted at Allied Hospital / Punjab Medical College, Faisalabad, Pakistan.

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