

Consequences of chemical accidents: analysis of the effects on health and the environment

Consecuencias de los accidentes químicos: análisis de los efectos a la salud y el entorno

Consequências dos acidentes químicos: análise dos efeitos na saúde e no meio ambiente

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Received: 08-12-2024 Accepted: 30-01-2025 Published: 05-02-2025

How to cite this article:

Guirola Fuentes J, Batista Reyes Y, Estrada Rodríguez Y. Consequences of chemical accidents: analysis of the effects on health and the environment RevInfCient [Internet]. 2025 [cited Access date]; 104:e4901. Available at: <http://www.revinfcientifica.sld.cu/index.php/ric/article/view/4901>

Dear Editor:

Toxicology has as its fundamental mission the prevention, diagnosis and treatment of poisonings, whether acute or chronic. Since the 1950s there have been anti-toxicology centers worldwide for the care of intoxicated patients. In Cuba, the National Center of Toxicology is established as the leading entity in this specialty, and the creation of regional centers has given rise to the Cuban Network of Toxicology.⁽¹⁾

According to the authors, at present, scientific and technological advances have facilitated exposure to a variety of chemical products (CP) in various activities. Data from the World Health Organization estimates that approximately 2.7% of global mortality is due to exposure to industrial and agricultural CP, as well as to accidental acute poisoning. In addition, chemical accidents (CA), whether unintentional or provoked, affect a significant number of people. Between 1970 and 2018, the Americas region recorded more than 4500 chemical emergency events that caused numerous victims and affected people.⁽²⁾



Globally, some chemical accidents have passed into history due to the high number of victims and evacuations. Incidents such as Flixborough (UK) in 1974, Seveso (Italy) in 1976, Bhopal (India) in 1984, as well as those that occurred recently in Beirut (Lebanon) in 2020, Boksburg (South Africa) in 2022 and in the port of Chittagong (Bangladesh) in 2022 stand out.

It is estimated that there are more than 10 million registered chemicals products, of which a minority represent a significant risk of acute or chronic poisoning. The health consequences of exposure to these products are associated with both individual and mass events. These situations have had political, economic, social and environmental repercussions, resulting in a considerable number of victims and evacuations among the affected population. In addition, it is important to highlight the use of CPs for terrorist purposes, a phenomenon that has been increasing in recent times.^(2,3)

It should be noted that during the transport, storage and use of chemical products, accidents can occur as a result of human error or natural phenomena. A chemical accident is defined as an event in which there is an uncontrolled release of one or more substances dangerous to human health and the environment, which generates significant human, environmental and economic costs, both in the short and long term. These events may include fires, explosions, leaks or releases of toxic substances, which have a negative impact on health and cause illnesses, injuries, disabilities or even death, affecting a wide spectrum of the population and causing considerable damage to the environment.⁽⁴⁾

In the opinion of the authors and according to documents of the Pan American Health Organization (PAHO), there are tools to improve the capacity of countries to manage chemical emergencies in an efficient and timely manner. However, not all countries fully comply with the International Health Regulations for this type of event. Countries are encouraged to build capacity to participate in awareness and preparedness for such eventualities.

It is also possible to participate through strategies that include the exchange of information with the community, managers, industry workers in the region, as well as with those who respond to chemical emergencies. This process involves health professionals in charge of the treatment to the affected population and the personnel of antitoxic centers.

In Cuba, the use of chemical products has increased in various industrial, productive and research activities. In order to protect people, animals and the environment from the harmful effects of these xenobiotics, laws, resolutions and guidelines have been enacted. However, the country has not been exempt from dangerous situations that could trigger chemical accidents. A relevant example is the incident that occurred at the Matanzas Supertanker Base.

It is considered that, in order to face this type of events, it is important to provide policy makers with the necessary tools through a multisectoral management model that includes all the actors involved in response to chemical accidents, which will contribute to improve the magnitude and quality of the answer to the occurrence of such events.



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Conflicts of interest:

The authors declare that there are no conflicts of interest.

Financing:

The authors did not receive funding for the development of the present research.

