## International Health Regulations (2005) and chemical events





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# International Health Regulations (2005) and chemical events

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#### 1. Introduction

In 2005, the World Health Organization (WHO) Member States adopted the revised International Health Regulations (IHR) (2005). The Regulations provide a unique public health framework in the form of obligations and recommendations that enable countries to better prevent, prepare for and respond to public health events and emergencies of potential international concern, including chemical events.

The first IHR were adopted by the World Health Assembly (WHA) in 1969, having been preceded by the International Sanitary Regulations adopted by the WHO in 1951. The 1969 Regulations, which initially covered six "quarantinable diseases", were amended in 1973 and again in 1981, primarily to reduce the number of covered diseases from six to three (i.e. yellow fever, plague and cholera) and to mark the global eradication of smallpox.

In consideration of the growth of international travel and trade, and the emergence or re-emergence of international disease threats and other public health risks (including those related to chemical exposure), the WHA in 1995 called for a substantial revision of the Regulations. After extensive negotiation, the IHR (2005) were finally adopted by the WHA in 2005 and entered into force on 15 June 2007 (WHO, 2008a).

The purpose of the revised IHR (2005) is to prevent, protect against, control and provide a public health response to the international spread of disease. Their scope is not limited to any specific disease or manner of transmission (as with the previous Regulations), but covers illness or medical conditions, irrespective of etiology, that present or could present significant harm to humans, including outbreaks of chemical origin. The IHR (2005) obligate States Parties to develop certain minimum core public health capacities (especially for early event detection and response) and to notify WHO of events that may constitute a public health emergency of international concern according to defined criteria.

The previous Regulations were designed to control selected communicable diseases, and historically the responsibility for their management was with the health sector. In other words, representatives of the ministry of health negotiated and adopted the IHR at WHAs, and it was the responsibility of the health sector to establish capacities to manage and notify about specific diseases. In the case of the revised IHR (2005), however, implementation is not the responsibility of the ministry of health alone. It is the responsibility of the State; all relevant sectors must play their part.

The revised IHR (2005) now cover all diseases and events of international public health concern, including those linked to biological, chemical and radiation hazards. In addition, the IHR (2005) cover not only persons but also baggage, cargo, containers, goods, postal parcels, and human remains that are contaminated or carry sources of contamination, so as to constitute a public health risk (Article 1, IHR (2005)). It is recommended that countries consider following all-hazard and multisectoral approaches when putting in place the IHR (2005) minimum core capacities, in order to utilize available resources as effectively and efficiently as possible.

The chemical industry is one of the largest economic sectors worldwide and it is growing particularly quickly in non-OECD (Organisation for Economic Co-operation and Development) countries (OECD, 2001, Sigman et al., 2012; UNEP, 2012). Many countries have laws and regulations governing chemical production and use. In addition, many countries have signed international agreements (e.g.

Basel, Rotterdam, Stockholm and Minamata Conventions) aimed at controlling the use, trade, movement and disposal of certain chemicals. Furthermore, the international community has agreed on the Strategic Approach to International Chemicals Management (SAICM), which provides the international policy framework to foster the sound management of chemicals and to promote multisectoral and multi-stakeholder approaches in achieving this objective.

The implementation of chemical-related national and international laws, agreements and approaches in countries is the responsibility of a number of sectors, including environment, labour, agriculture, health, civil protection, transport and customs. However, many of the capacities needed to implement these laws and agreements are relevant to the preparedness, prevention and response to public health events and emergencies under the IHR, e.g. capacities for chemical risk assessment and for chemical event response. It is therefore important for health authorities to reach out to, and collaborate with, the authorities that are responsible for chemical control laws when identifying or establishing the core capacities for chemical events under the IHR.

The concept of building and strengthening capacities common to different, but related, instruments and sets of legislation is also central to IHR implementation. Annex 1 of the Regulations, for example, requests countries to utilize existing structures to meet their core capacity requirements, including those outside the health sector. In addition, Article 14 requests WHO to cooperate and coordinate its activities with other competent organizations and international bodies in the implementation of the Regulations. These include international organizations that have a role in the management of chemical events, such as some of the Participating Organizations of the Inter-Organization Programme for the Sound Management of Chemicals (IOMC, 2015a) and the Environmental Emergencies Section of the Joint UNEP/OCHA (United Nations Environment Programme and Office for the Coordination of Humanitarian Affairs) Environment Unit (UNEP/OCHA, 2015).

The goals of this document are: (i) to provide information about building IHR (2005) core capacities for chemical events; (ii) to assist National IHR Focal Points (NFPs) to identify national institutions having a role in the management of chemicals; (iii) to raise awareness about the IHR (2005) in professionals who have a role in the management of chemicals under various regulatory contexts but who are not familiar with the IHR (2005); and (iv) to provide information to facilitate an interministerial approach for the management of chemical events, including building synergies in the implementation of relevant international agreements.

#### 2. Types of chemical events and notification under IHR (2005)

Chemical events arising from technological incidents, natural disasters, conflict and terrorism, polluted environments, and contaminated foods and products are common and occur worldwide. Table 1 provides examples of chemical events that have been identified through WHO surveillance and response activities. To give an idea of the potential scale of the problem, the International Federation of Red Cross and Red Crescent Societies (IFRC) has estimated that between 2003 and 2013 there were 7298 disasters worldwide, 2923 of them "technological incidents" (e.g. industrial and transport accidents) that affected nearly 1.5 million individuals (IFRC, 2015).

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Year	Location	Description of event (Reference)	Consequences	IHR (2005) Annex 2 criteria*
2006	Côte d'Ivoire	Dumping of waste in the city of Abidjan (UNDAC, 2006; WHO, 2009)	10 deaths, thousands made ill; international assistance was needed	Yes to (i) and (ii); no to (iii) and (iv)
2006	China	Plant explosion releasing 100 tonnes of pollutants in the Songhua River, which crosses international borders (UN, 2006; WHO, 2009)	Five deaths; millions of people without water for several days	Yes to (i), (ii) and (iii); (iv) unknown
2006	Panama	Diethylene glycol in a cough syrup (Rentz et al., 2008; WHO, 2009)	At least 100 deaths	Yes to (i), (ii), (iii) and (iv)
2007	Angola	Sodium bromide confused with table salt (WHO, 2009)	At least 460 people ill, mostly children; international assistance was needed	Yes to (i) and (ii); unknown to (iii) and (iv)
2008	China	Milk and infant formula adulterated with melamine (WHO, 2008b; Gossner et al., 2009)	Approx. 300 000 victims, with six infants dying from kidney stones and other kidney damage; more than 50 000 children hospitalized	Yes to (i), (ii), (iii) and (iv)
2010	Nigeria	Lead from informal gold mining of lead-containing ore using crude, dust- generating technology (MSF, 2012; Yi-Chun et al., 2012)	More than 400 children died; many communities affected; international assistance was needed	Yes to (i) and (ii); no to (iii) and (iv)
2010	Hungary	Burst of sludge reservoir at aluminium plant; pollutants released into nearby villages and the Danube River, which crosses international borders (Reliefweb, 2010)	At least 150 injuries and 9 deaths from the corrosive effect of the sludge	Yes to (i), (ii) and (iii); no to (iv)
2010	USA	Explosion of the Deepwater Horizon oil rig in the Gulf of Mexico (King & Gibbins,	11 deaths from explosion; fishing communities affected;	Yes to (i), (ii), (iii) and (iv)

*Table 1: Examples of chemical events of international public health significance (assessed by applying the decision criteria listed in Annex 2 of the IHR (2005))* 

Year	Location	Description of event (Reference)	Consequences	IHR (2005) Annex 2 criteria*
		2011)	risk of international spread; minor injuries and health effects in health workers, volunteers and people living close to the affected shorelines; possible long-term effects	
2011	Ecuador	Methanol intoxication (PAHO, 2011)	177 affected; 29 deaths	Yes to (i), (ii) and (iii) – potentially (iv)
2011	Republic of Korea	Humidifier sterilizers (Kim et al., 2014)	17 cases of interstitial lung disease	Yes to (i) and (ii); (iii) and (iv) unknown
2012	Czech Republic	Methanol poisoning from alcoholic beverages (WHO, 2013; Zakharov et al., 2014)	23 deaths and 35 people hospitalized with methanol poisoning.	Yes to (i), (ii) and (iii); and possible (iv)

\* (i) The public health impact of the event was serious; (ii) The event was unusual or unexpected; (iii) There was a significant risk of international spread; (iv) There was a significant risk of international travel and/or trade restriction.

The worldwide production, trade and use of chemicals are predicted to increase further. This is particularly true in developing countries and those with economies in transition, where chemical production, extraction, processing and use are closely tied to economic development. For these countries, the OECD projects a six-fold increase in chemical production by 2050 (Sigman et al., 2012).

Despite the omnipresence of chemicals worldwide and their predicted increase in production and use, many countries lack adequate capacities to deal with the health aspects of chemical events and emergencies. Even where these exist, crisis situations may occur, overwhelming national response capacities and requiring international assistance to be provided.

A chemical event in one country can lead to health consequences in another country. An example would be the release of chemicals into a river that crosses international borders. This can result in contaminated drinking-water and food (e.g. fish, or vegetables if polluted river water is being used for irrigation) in another country downstream. Actual examples of such events include the explosion at a chemical plant on the banks of the Songhua River in China in 2006 (WHO, 2009) and the rupture of a sludge reservoir at an aluminium plant in Hungary in 2010 (Reliefweb, 2010). Another kind of chemical event is one where chemically unsafe food, consumer products or drugs produced in one country are traded internationally, leading to health problems in other countries. Examples include cough syrup containing diethylene glycol in Panama in 2006 (Rentz et al., 2008; WHO, 2009) and milk and infant formula adulterated with melamine in China in 2008 (WHO, 2008b; Gossner et al., 2009).

Under the IHR, countries are required to notify WHO of all events, chemical or otherwise, that are assessed as possibly constituting a public health event of international concern, taking into account the context in which an event occurs (e.g. an event that occurs in a setting with inadequate response capacities). Notifications must be made within 24 hours of assessment by the country using the decision instrument provided in Annex 2 of the Regulations. This decision instrument identifies four criteria by which countries should assess events within their territories and decide whether an event is notifiable to WHO. These criteria are: (i) if the public health impact of the event is serious; (ii) if the event is unusual or unexpected; (iii) if there is a significant risk of international spread; and (iv) if there is a significant risk of international travel and/or trade restriction. Countries that determine that an event meets any two of the four criteria above, should notify WHO under the Regulations through the National IHR Focal Point.

#### 3. Core capacities required under the IHR (2005)

The IHR (2005) require countries to establish core capacities for surveillance and response at all administrative levels in a country (national, intermediate and local) and at designated airports, ports and ground crossings (see Annex A). This requires effective coordination and collaboration of multiple authorities within a country and would need to involve the ministry of health or IHR NFP and other ministries responsible for important elements of chemical surveillance and response. To facilitate the flow of information, relevant ministries should designate contact points for IHR implementation to communicate with the ministry of health.

Legislation in countries aimed at the control of chemical production and use, including the management of chemical accidents (e.g. at chemical plants), should reflect the requirements of the IHR (2005), whenever appropriate.

In general the core capacities needed for chemical events can be grouped into four strategic areas, as shown in Table 2. Strategic areas are made up of a number of capacity-building elements that countries have started to monitor in the process of assessing their readiness to implement the IHR  $(2005)^1$ . Important capacity-building elements are discussed in the following sections.

1 dote 2. mm (2005)	core capacities for chemical events
Strategic area	Important capacity-building elements
Policy coordination	<ul> <li>Designated Focal Points for the IHR in all authorities that have an</li> </ul>
and communication	important role in the management of chemical events, for coordination and

#### Table 2: IHR (2005) – Core capacities for chemical events

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