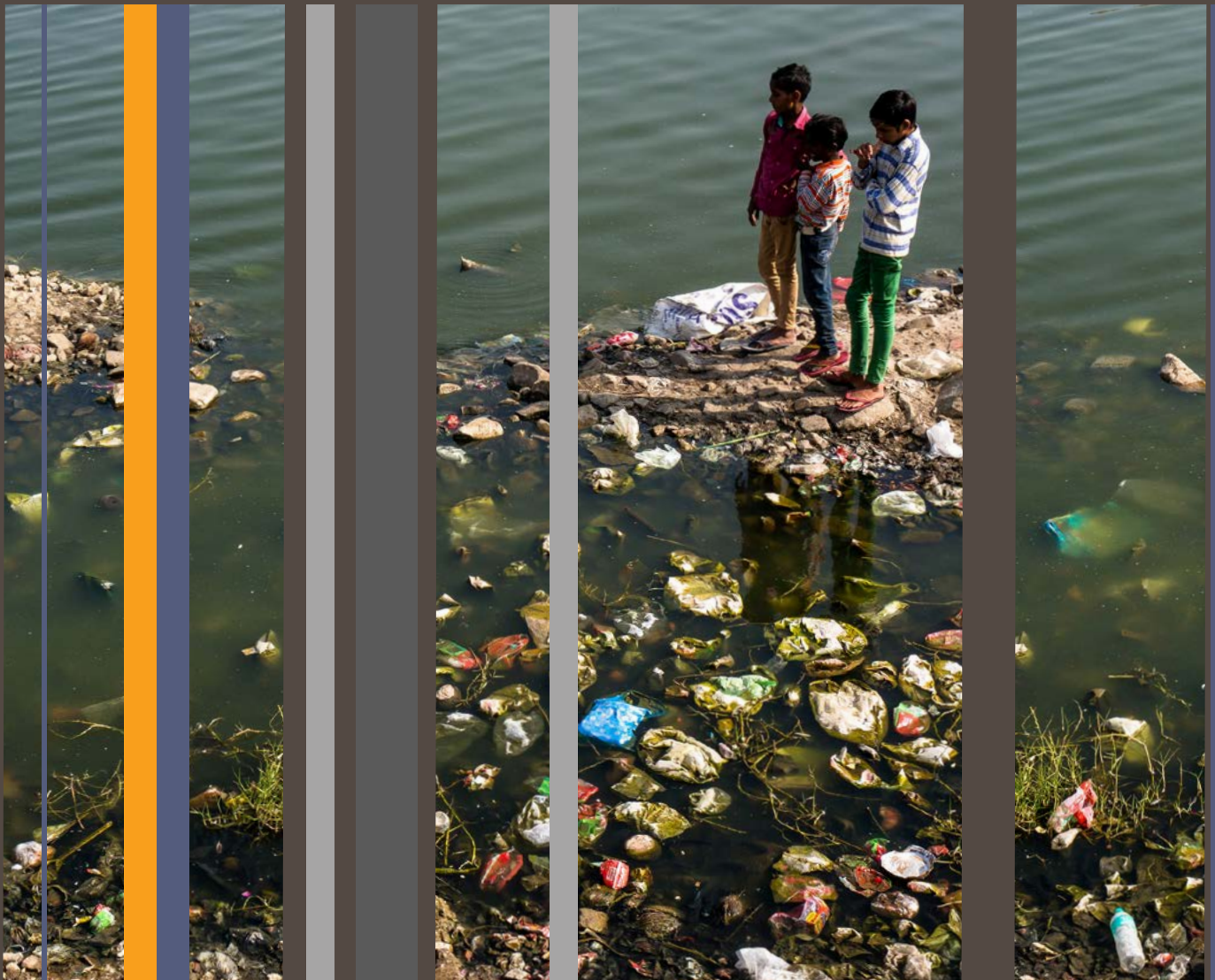


Manual for investigating suspected outbreaks of illnesses of possible chemical etiology

Guidance for investigation and control



World Health
Organization



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Manual for investigating suspected outbreaks of illnesses of possible chemical etiology: guidance for investigation and control

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Foreword

Society depends on chemicals for a myriad of purposes, including food production, water sanitation, transport, heat and power generation and consumer products and pharmaceuticals. These requirements are met by a vast chemical industry that sources, synthesizes, stores, transports and uses chemicals in large amounts, before recycling and/or waste disposal. According to the European Chemical Industry Council (2), global chemical sales (excluding pharmaceuticals) in 2018 amounted to € 3.35 trillion, reflecting production of basic chemicals such as sodium hydroxide and chlorine and of agricultural fertilizers, speciality chemicals such as paints, dyes, herbicides, pesticides and insecticides, as well as petrochemicals.

The trend of overall growth in demand and production of chemicals is expected to continue. World chemical sales are predicted to reach € 6.6 trillion in 2030. Future industry growth is expected to be driven mainly by emerging markets, where the gains up to 2022 are likely to be 6–10% per year, whereas the gain will be 2–3% in higher-income economies. Brazil, China, India, the Russian Federation and South Africa together accounted for 44.1% of global chemical sales in 2017. In that year, nearly 75% of global chemical sales were made by those countries, the countries of the European Union and the USA together and the remaining 25% mainly by emerging countries in Asia, including the Middle East (2).

Production of chemicals undoubtedly contributes to job creation, economic prosperity and public health and well-being. Many high-production volume chemicals are, however, known to be toxic, and exposure during incidents, accidents and disposal may have both acute

The causes of many chemical incidents are obvious, such as an explosion, fire or leak resulting in the release of an airborne plume, tainting and polluting water or depositing particles on land. Some incidents can have international consequences, for example when a chemical release contaminates an environmental medium such as air or water and subsequently traverses national borders. Further information is available in a WHO publication on the public health management of chemical incidents (4). Occasionally, however, a chemical release may not be obvious and the possibility considered only when a number of cases present or are reported. Timely identification of the cause requires detection and verification of clusters and a subsequent outbreak investigation. The investigations may require a detailed study with epidemiological, environmental, clinical and toxicological approaches. As the number of candidate chemicals may be vast, including high production volume and toxic industrial chemicals, pesticides and obsolete substances such as persistent organic pollutants, it may be very difficult to link an exposure to the presenting signs and symptoms.

The potential impact of such exposures may be significant and may require reporting to WHO in accordance with the requirements of the International Health Regulations (2005) (5), which specify the obligations of Member States to identify, assess and subsequently report to WHO events that may be unusual, have serious public health consequences or potential for international spread and/or may result in restrictions on international travel or trade. WHO may in turn declare such events as constituting a public health emergency of international concern. To meet their obligations, Member States must establish and

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