



# OVERVIEW OF CHEMICAL AND INDUSTRIAL ACCIDENTS

*Focused thematic discussion on chemical and industrial accidents  
UNDRR European Forum on Disaster Risk Reduction (EFDRR)  
24 November 2021, 10.00 – 12.00 CET, Matosinhos, Portugal and online*



## Hazardous chemicals & industrial development

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- According to the UNEP Global Chemical Outlook II, chemicals production **is soaring in the last decade**;
- The size of the global chemical industry exceeded US dollars 5 trillion in 2017, and is expected to **double by 2030** \*;
- Dependence on chemicals for technological progress is also increasing and **many substances used for implementing new technologies are hazardous**.

*[\\*https://www.unenvironment.org/explore-topics/chemicals-waste/what-we-do/policy-and-governance/global-chemicals-outlook](https://www.unenvironment.org/explore-topics/chemicals-waste/what-we-do/policy-and-governance/global-chemicals-outlook)*



## Disastrous chemical accidents are still happening

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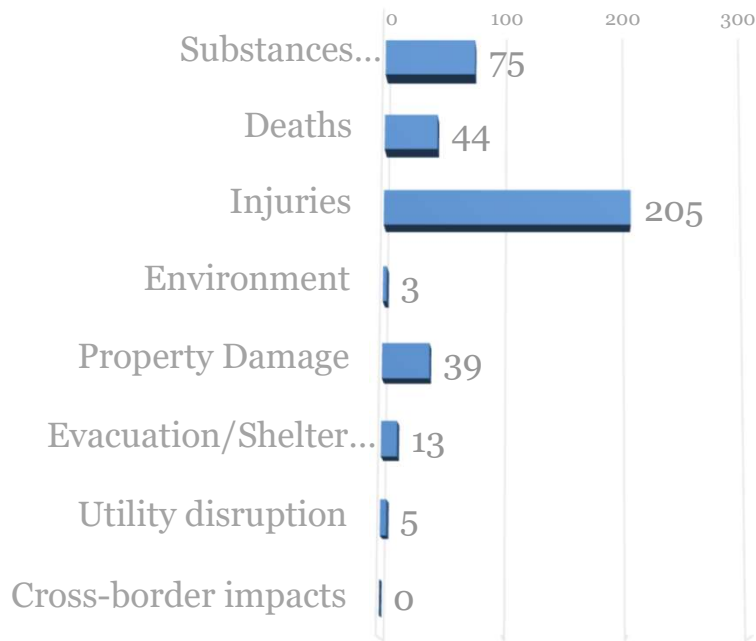
- Severe chemical accidents continue to happen worldwide and in the EU.
- Over the past decades, successive major accidents, have caused **deaths, injuries**, significant **environmental pollution** and **massive economic losses**, e.g.;
  - Leverkusen, Germany (2021)
  - Beirut, Lebanon (2020),
  - Rouen, France (2019),
  - Bentos Rodrigues, Brazil (2015),
  - Tianjin, China (2015),
  - West, Texas, US (2013)
  - Gumi, Korea (2013)
- Recovering from industrial accidents sets back development gains, takes time and is expensive and many places still suffer from events that happened years before.



# eMARS - EU and EEA major accidents for period 2016-2021 (as of 14.10.21)

140 (published and unpublished) reports of major accidents occurring on EU Seveso sites from January 2016 to October 2021. Of these 135 have consequences identified.

*Most common reasons for reporting are volume of substance released (75), property damage (38), and human health impacts (37)*



**44 Fatalities** in total (10 with multiple)

6 accidents with over 10 injuries, **205 injuries** in total

In 2019, one event **closed 237 schools in 12 communities** for 2 days

In 2016 a refinery fire cost nearly €800 million in damages and an explosion in a steel factory in 2016 cost €80 million

In 2017 **~5000 people had to drink bottled water for 9 days** due to a bromine release to the water supply

*Source: Maureen Wood, Major Accident Hazards Bureau, Joint Research Center of the European Commission, from a presentation made at the 31st OECD meeting of the Working Party on Chemical Accidents, October 2021.*



## Notable chemical accidents in the EU

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- Sulphur dioxide release at a pulp production site in Hallein, Austria on 2 June 2021

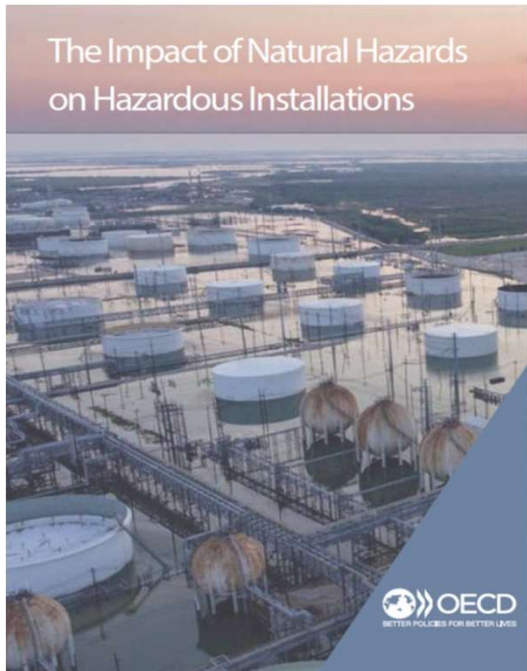
One person was killed onsite. The accident highlighted challenges associated with **emergency planning** (especially **information to the public** and **crisis management**) and risk management and monitoring of **ageing equipment**.

- Explosion in the Waste Management Centre in Leverkusen, Germany, followed by a fire, 27 July 2021

7 persons were killed and 31 were injured. Preliminary investigations are focusing on the **conditions in which the waste was stored** and **associated control measures**.

# Natech Accidents

Natural hazards, such as earthquakes, floods or storms, can initiate events which may challenge the safety and operation of hazardous installations and trigger an accident.



Joint Natech Project between the  
OECD, UNECE, JRC, UNEP/OCHA  
Joint Environment Unit

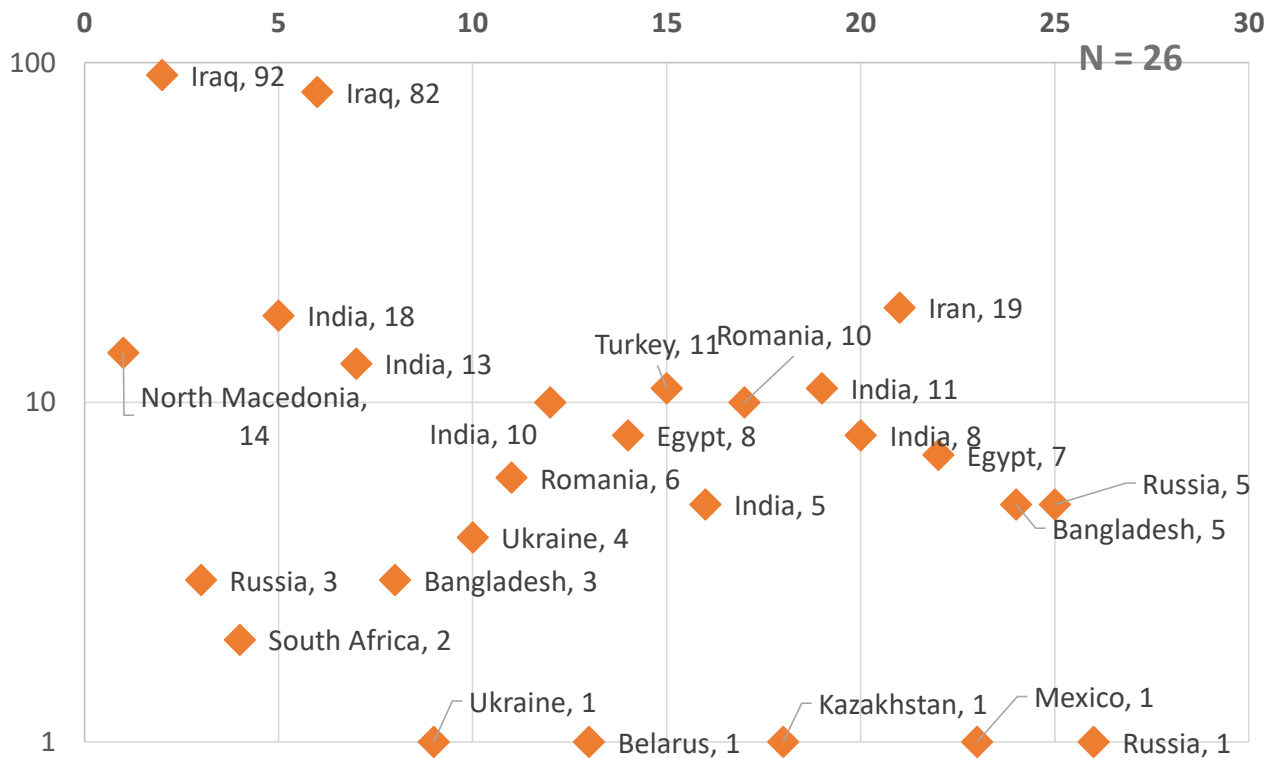
Would welcome participation from  
the disaster community in the  
project!



*Eruption of Cumbre Vieja volcano on La Palma,  
Spain 11 October 2021: Lava engulfs a cement  
factory which catches fire*



# Oxygen-related fires in hospitals during the pandemic



46 fires associated with Covid-19 oxygen therapy have occurred since May 2020, 26 of them have been fatal.

- The MAHB alert\* (Lessons Learned Bulletin) published in January 2021, but 18 incidents occurred in months after, 11 of them fatal.
- Most incidents occurred in developing countries. Of 5 incidents in the European Union, two were fatal.
- In April 2021, due to the JRC intervention, the WHO added oxygen risk management advice to its guidance and training.

Source: Maureen Wood, Major Accident Hazards Bureau, Joint Research Center of the European Commission, from a presentation made at the 31st OECD meeting of the Working Party on Chemical Accidents, October 2021.

\* *Lessons Learnt Bulletin Special Issue*, Co-authored by M. Wood, M. Hailwood and K. Koutelos, Risk of oxygen-related fires in hospitals treating Covid-19 patients, [https://minerva.jrc.ec.europa.eu/en/shorturl/minerva/llb\\_2\\_covidoxygenu2pdf](https://minerva.jrc.ec.europa.eu/en/shorturl/minerva/llb_2_covidoxygenu2pdf)



## Challenges ahead.....

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- Continue to help maintain a high level of safety;
  - Raise awareness of the risks and costs of accidents at higher policy levels;
  - Make chemical accident prevention a priority for the sound management of chemicals;
  - Integrate prevention, preparedness and response to chemical accidents with disaster risk reduction and disaster risk management, in particular in the case of Natech accidents.
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