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Technological disasters

Natural vs. Technological Disasters

Brussels, 2020 – Two main groups of disasters are distinguished in the international disaster database EM-DAT: natural disasters and technological disasters. While natural hazards are associated with natural disasters, industrialization and technologies have resulted in accidents or unexpected and uncontrolled release of hazardous and explosive materials, which we consider technological disasters.

Although technological disasters account for about a third (36.4%) of all reported disasters in EM-DAT since 1900, this type of disaster generally receives less attention from the scientific community. Nevertheless, impactful and often dramatic events such as the Chernobyl nuclear accident in 1986 or the more recent Beirut harbour explosion on August 4 of this year covered international headlines due to the huge humanitarian, political, social and economic shock of these events.

Comparing the human impact of natural and technological disasters between 1900-2020 shows that on average, natural disasters caused 2083 deaths/disaster and 526 807 affected/disaster compared to 42 deaths/disasters and 915 affected/ disaster for technological disasters. This might be explained by the narrower spatial and temporal scale of technological disasters compared to natural disasters. The pattern in the occurrence of technological disasters over time from 1980 onwards is presented in Fig. 1.

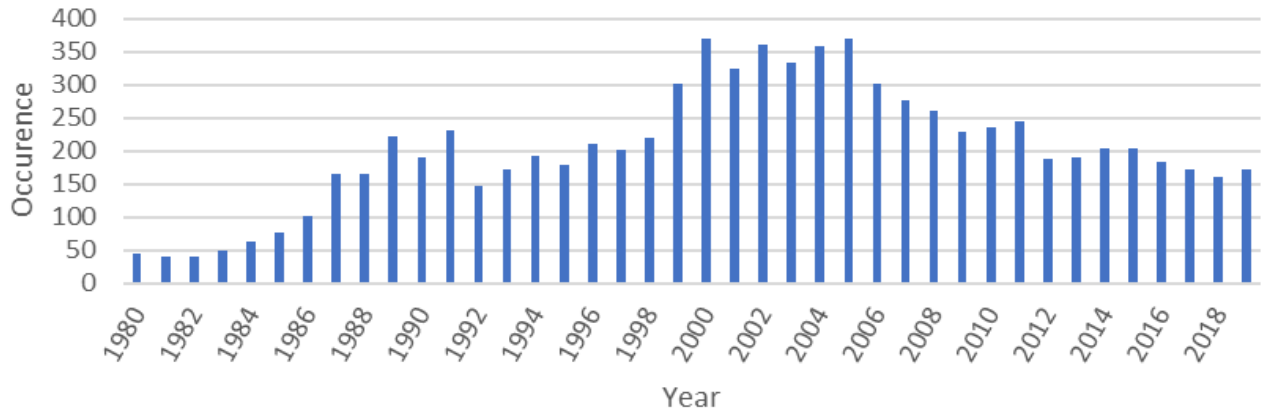

Fig. 1: Occurrence of Technological Disasters 1980-2019 (EM-DAT Database)

Technological Disaster subtypes

Technological disasters can be further divided into industrial (chemical spill, collapse, explosion, fire, gas leak, poisoning, radiation and other), transport (air, rail, road and water), and miscellaneous accidents (fire, collapse, explosion and other).

Between 2000-2019, EM-DAT recorded 5143 technological disasters of which approximately two thirds (3532 disasters) were reported as transport accident (Fig. 2.a). Although industrial accidents counted for only 16% of the reported technological accidents, this disaster type affected more than 1.4 million people (64% of total affected among technological disasters) between 2000-2019 (Fig. 2.b).

Fig. 2: Occurrence (a) and total affected people (b) per Disaster type for Technological Disasters 2000-2019

On the 4th of August 2020, a large amount of ammonium nitrate stored at the port of the city of Beirut exploded, causing 220 deaths and affecting more than 300 000. This devastating explosion stirred up the already existing social unrest and downward economic spiral, risking a further escalating humanitarian crisis.
EM-DAT defines such a technological disaster as an industrial accident, when buildings of industrial nature are involved in the accident (Fig. 3).

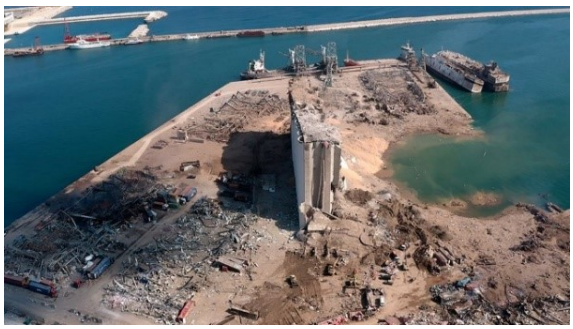

Fig. 3: Beirut explosion on August 4th, 2020 (Source: BBC)

Geographical distribution

From 2000-2019, there were 2251 technological disasters recorded in Asia, resulting in 75 072 deaths and affecting 986 282 people. This makes Asia the continent with the highest number of events, deaths and affected people, followed by Africa where 1690 events, 54 755 deaths and 419 256 affected were reported. These two continents counted for more than 75% of the reported events, 80% of reported deaths and 65% of reported affected. At country level, the top 10 countries with highest occurrence of technological disasters from 2000-2019 are dominated by emerging and newly industrialized countries (Fig. 4).

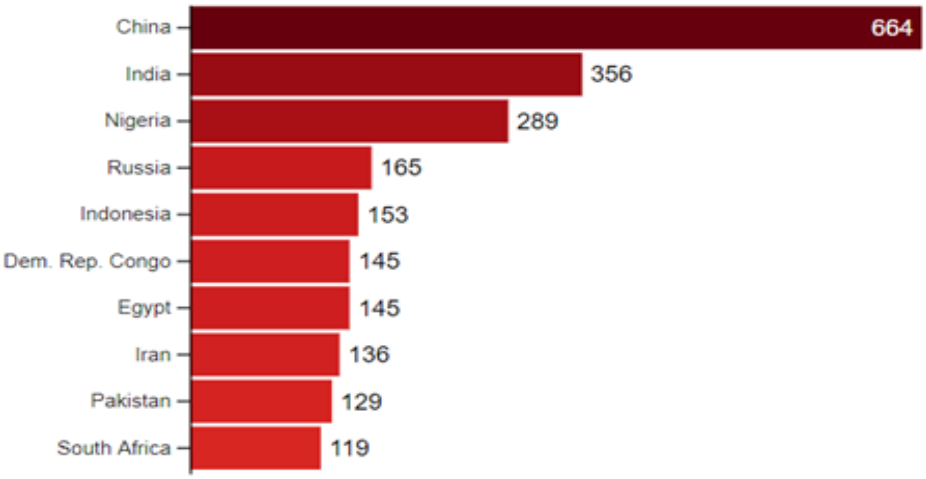

Fig. 4: Top 10 countries, occurrence Technological Disasters 2000-2019 (EM-DAT Database)

References:
EM-DAT, CRED / UCLouvain, Brussels, Belgium – www.emdat.be (D. Guha-Sapir)

Cred updates and recent publications

- Guha- Sapir D., Moitinho De Almeida M., Scales S.E., Ahmed B., Mirza I. (2020) Containing measles in conflict-driven humanitarian setting, BMG Global Health, 5:e003515
- Jennes S., Al-Shams M., Rodrigues Leal Moitinho De Almeida M., Guha-Sapir D., Nyanchoka L., (2020) Réponses aux catastrophes liées au feu en Belgique. Hospitals.be, 18-23
- Two reports commissioned by UNDRR under preparation : 'The human cost of disasters: an overview of the last 20 years' and 'Tsunami disaster risk'
- Data are subject to change, for enquires: contact@emdat.be