

13 Assessment of consequences

This chapter provides principles to industry and public authorities relating to the establishment of criteria and methods for gathering data, assessing the consequences and analysing the impacts of a chemical accident.

Both industry and public authorities should establish criteria and methods for gathering data and assessing the consequences and analysing the impacts of a chemical accident.

In particular, authorities should establish strategies for the collection of data over a longer period following a chemical accident, ensuring that the resources and expertise for carrying out environmental and epidemiological studies can be made available should the need arise.

The consequences that are most easily identified are those with immediate effects such as death, acute health effects, fire and explosion damage to property, acute environmental effects on watercourses and visible deposition of chemical substances. Community disturbances (e.g. evacuation or shelter-in-place) and temporary or permanent business interruptions may also take place.

Public authorities in particular should be aware that some consequences have medium- and long-term effects and their impacts can only be assessed over time. Therefore, there should be plans in place to facilitate gathering data and analysing impacts over a period of time. The plans should foresee the allocation of sufficient resources and expertise and prescribe cost recovery mechanisms in line with the polluter pays principle.

Medium- and long-term effects may cover a range of consequences:

- **Human health:** Chronic or repeated exposure to hazardous substances may occur, in particular, if the food chain or drinking water has become contaminated and appropriate monitoring is not adopted. Psychological and mental health effects may become long-term. In particular, traumatic events may lead to flashbacks, depression or other related consequences. These effects may occur not just in those immediately affected but also among family, friends and the general community.
- **Environmental consequences:** Pollution to water or soil events may take some time to become apparent. Pollution at the ground surface may percolate down to contaminate groundwater. This may lead to a great separation of time and place between the source of the pollution and the identification of the effects. This can have an effect on the drinking water supply. The release of a hazardous substance into the soil may lead to them being dispersed in the ecosystem by being taken up by organisms and rising through the food chain. This can also lead to an impact on human health where agricultural products or fruit and vegetables from household gardens are affected.
- **Economic impacts:** The economic impacts can be significant following a chemical accident. It may take years for property damage insurance claims to be regulated. A large explosion that causes widespread breakage of window glass may mean that due to the extent of damage, there are delays until all of the windows are repaired.

Closure of an industrial facility or reduced production capacity can have knock-on effects in the community due to unemployment, reduction in the economic demand in the community, etc. These effects can be especially significant when the facility is a major employer and thus the economic focus of a community. There can also be supply chain effects in the larger economy if the site produces a speciality product or a product in high demand that takes time to source elsewhere.

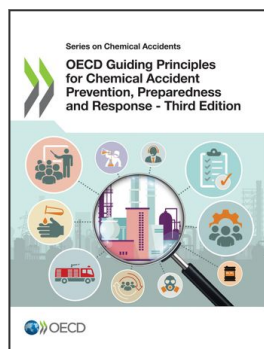
- **Social impacts:** A serious chemical disaster may also lead to long-term distrust within the community of the industry's good faith and willingness to invest sufficiently to prevent chronic and acute effects from their operations. Likewise, the community may no longer have faith that the government will protect them from capitalist interests. These attitudes can discourage economic progress or expansion of certain industries in the regional or national economy. They can also result in long legal battles against both government and industry, particularly if there are perceived long-term health effects. The population may also lose general confidence in the government's ability and willingness to protect them in other arenas. In some cases, perceived inequities associated with the surrounding populations may also be fuelled by an industrial disaster.

A data collection and analysis strategy for the longer-term effects should be agreed upon and launched as soon as possible following the accident. The strategy should establish clear objectives for the study and emphasise reliance on a wide range of sources.

- These sources typically include medical and epidemiological data, environmental data from spot measurements and measurement networks, and financial and economic data. Systems for collating and analysing the data should aim to include geographic information systems (GIS) and computer databases as well as text and photographic archives.
- Having numerous sources and types of data can give diverse perspectives to the analysis but also strengthen certain findings or reduce uncertainty by giving information not covered by other data sources.

Long-term data collection and analysis should be structured to generate reports of findings at regular intervals, preferably benchmarked against reference criteria as much as possible. There should be scheduled reviews to determine if the studies are achieving their objectives and if the process of data collection can be improved.

Where potential effects cross boundaries of jurisdictions, whether within a country or across international boundaries, protocols and procedures should be agreed to ensure that the data and information are collected and analysed in as uniform a manner as possible. Where the potential effects may cross an international boundary, provision should be made for access to the data and the results of the analysis to be made available to both sides of the boundary, taking account of any language requirements as appropriate.



From:

OECD Guiding Principles for Chemical Accident Prevention, Preparedness and Response - Third Edition

Access the complete publication at:

<https://doi.org/10.1787/162756bf-en>

Please cite this chapter as:

OECD (2023), "Assessment of consequences", in *OECD Guiding Principles for Chemical Accident Prevention, Preparedness and Response - Third Edition*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/2c84f1c8-en>

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