

MORTALITY DUE TO AIR POLLUTION AND EXTREME WEATHER CONDITIONS

Environmental degradations, in particular air pollution and extreme weather conditions due at least partly to climate change, expose people to health risk and excess mortality.

Air pollution increases the risk of various health problems (including respiratory diseases, lung cancer and cardiovascular diseases), with children and older people being particularly vulnerable. Some projections have estimated that outdoor air pollution may cause 6 to 9 million premature deaths a year worldwide by 2060 and cost 1% of global GDP as a result of sick days, medical bills and reduced agricultural output (OECD, 2016).

In Europe, exposure to some serious air pollutants such as fine particulate matter 2.5 (PM_{2.5}) and ozone is estimated to have caused the death of 238 400 people in 2016. Mortality rates due to air pollution are highest in Central and Eastern Europe (e.g. Bulgaria and Hungary) while they are lowest in Nordic countries (Figure 4.20).

Climate change-related events – such as extreme temperatures, floods, and drought – also have serious consequences on health and premature death. Heat waves can cause health problems such as fatigue, dehydration and stress, and can lead to respiratory and cardiovascular diseases, and aggravated allergies (European Environment Agency, 2017; OECD, 2017). Some population groups, such as the elderly and people with chronic diseases, are more vulnerable to heat waves, but also to cold waves in some countries, particularly the Northern and Eastern part of Europe.

Figure 4.21 shows the death rate related to extreme temperature events in Europe, cumulated over the 2000-2016 period. Heat waves had a much bigger impact than cold waves, particularly in Southern and Western Europe. Several Southern European countries were mostly impacted by the heat wave in 2003 when more than 55 000 persons died in France, Italy, and Spain, and more recently in 2015 when 3 700 people died in France and Belgium. Cold waves have had an impact on mortality mainly in Eastern Europe and Nordic countries, with the latest largest event causing 350 deaths in Poland and Romania in 2012.

Cross-sectoral policy actions to limit greenhouse gas emissions and control the rise in temperature are essential to limit the detrimental impacts on human health and the environment. While there have been improvements in reducing the emission of a number of air pollutants in the past decade, further efforts are needed to reduce air pollution, notably by reducing emissions from motor vehicles, but also from power stations, which produce more pollution than any other industry. Health care systems also have a role to play in reducing environmental risk factors, for instance by supporting the implementation of nutritional guidelines for healthier food consumption that can put less stress on the environmental resources used in food production (OECD, 2017).

Definition and comparability

The first indicator presented here refers to mortality due to air pollution (specifically PM_{2.5} and ozone) and is based on estimates from the Global Burden of Disease study (IHME, 2016).

Fine particulate matter (PM) is a mixture of very small particles and liquid droplets released into the air. PM_{2.5} refers to suspended particulates less than 2.5 microns in diameter that are capable of penetrating deep into the respiratory tract and causing significant health damage. They are potentially more toxic than PM₁₀ as they may include heavy metals and toxic organic substances. Most fine particulate matters come from fuel combustion, including from vehicles, power plants, factories and households.

Ozone is a secondary pollutant (meaning that it is not emitted directly by any emission source), formed in the lower part of the atmosphere from complex chemical reactions following emissions of precursor gases such as nitrogen dioxides (which are emitted during fuel combustion). Ozone exposure is generally highest in emission-dense countries with warm and sunny summers.

Data on fatalities due to extreme temperature events come from the Emergency Events Database (EM-DAT). EM-DAT includes all disasters worldwide since 1900, conforming to at least one of the following criteria: a) 10 or more people dead; b) 100 or more people affected; c) the declaration of a state of emergency; d) a call for international assistance. Empty fields in the EM-DAT database usually indicate missing values or non-reported information. Missing information in EM-DAT was complemented with data from national registry on deaths by cause collected in the WHO Mortality Database. Deaths due to exposure to excessive natural heat (ICD code X30) and exposure to excessive natural cold (X31) were selected.

References

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