Air pollution increases the risk of various health problems (including of course respiratory diseases, but also lung cancer and cardiovascular diseases), with children and older people being particularly vulnerable. According to WHO estimates, nearly 500 000 deaths in Europe in 2012 were linked to exposure to outdoor air pollution (WHO, 2014).

Air pollution concentrations are greater in urban areas in all countries. Of all air pollutants, fine particulate matter (PM) has the greatest effect on human health. Most fine particulate matter comes from fuel combustion, including from vehicles, power plants, industries and households.

Despite a reduction in the emission of PM_{10} over the past decade, a considerable portion of the urban population in EU countries continued to live in 2013 in areas where PM_{10} levels exceeded the EU and WHO threshold. The emission of PM_{10} across all EU countries decreased by 27% between 2003 and 2013, and the exposure of the urban population to PM_{10} also fell in most countries (Figure 4.30). Population exposure to PM_{10} remains high in Bulgaria, as well as in the FYR of Macedonia and Turkey.

In the European Union as a whole, nearly one fifth of the population lived in areas where the EU air quality limits for particulate matter was exceeded in 2013 (Figure 4.31). This share varied from 17 to 41% between 2001 and 2013, peaking in 2003, 2006 and 2011, and decreasing ever since. The proportion of the EU urban population exposed to PM_{10} levels exceeding the WHO air quality guidelines, which are stricter than the threshold set by EU legislation, was much higher, reaching 60.9% of the total urban population in 2013 (European Environment Agency, 2015). Following the WHO air quality guidelines would significantly improve health and reduce mortality. In France, exposure to $PM_{2.5}$ pollution causes 48 000 premature deaths per year, which represents 9% of the total mortality. If the WHO air quality guidelines were met for $PM_{2.5}$ levels all over France, 17 700 deaths could be avoided each year, leading to a 4% decrease in mortality (Pascal et al., 2016).

A large percentage of people living in urban areas in EU countries are also exposed to other air pollutants for which concentrations exceed the thresholds set in the EU legislation and the WHO air quality guidelines. In the period from 2001 to 2013, between 14 and 58% of the urban population in EU countries was exposed to ozone (O_3) concentrations exceeding the EU target value set for the protection of human health. This proportion peaked in 2003 and 2006, but has declined since then and now appears stable. Similarly, in the period 2001-13, between 8% and 27% of the urban population in EU countries was exposed to nitrogen dioxide (NO_2) concentrations above the EU limit for the protection of human health. This proportion also peaked in 2003 and has come down since then.

While there have been improvements in reducing emissions of a number of air pollutants in the past decade, further efforts are needed to reduce air pollution, notably by reducing emissions from transports due to motor vehicles, but also from power stations which produce more pollution than any other industry. Better dispersion of pollutants emitted by tall chimneys can promote better dilution in the air and lower local concentrations of pollutants. However, this leads to wider dispersion of pollution and trans-boundary air pollution. Stricter operating practices and the use of modern techniques have resulted in a sizeable reduction in the amount of pollutants emitted from power stations.

Definition and comparability

The indicators presented here refer to population exposure to particulate matter 10 (PM_{10}) and other pollutants in cities with more than 100 000 population. The estimates represent the average annual exposure level of the average urban resident.

PM_{10} refers to suspended particulates less than 10 microns in diameter that are capable of penetrating deep into the respiratory tract and causing significant health damage. Fine particulates smaller than 2.5 microns in diameter ($PM_{2.5}$) cause even more severe health effects because they penetrate deeper into the respiratory tract and are potentially more toxic as they may include heavy metals and toxic organic substances (OECD, 2013). $PM_{2.5}$ is newly available in ECHI indicators collected by Eurostat.

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).

Data on exposure to air pollution are available for most but not all European countries. Further efforts are needed to monitor or estimate overall population exposure.

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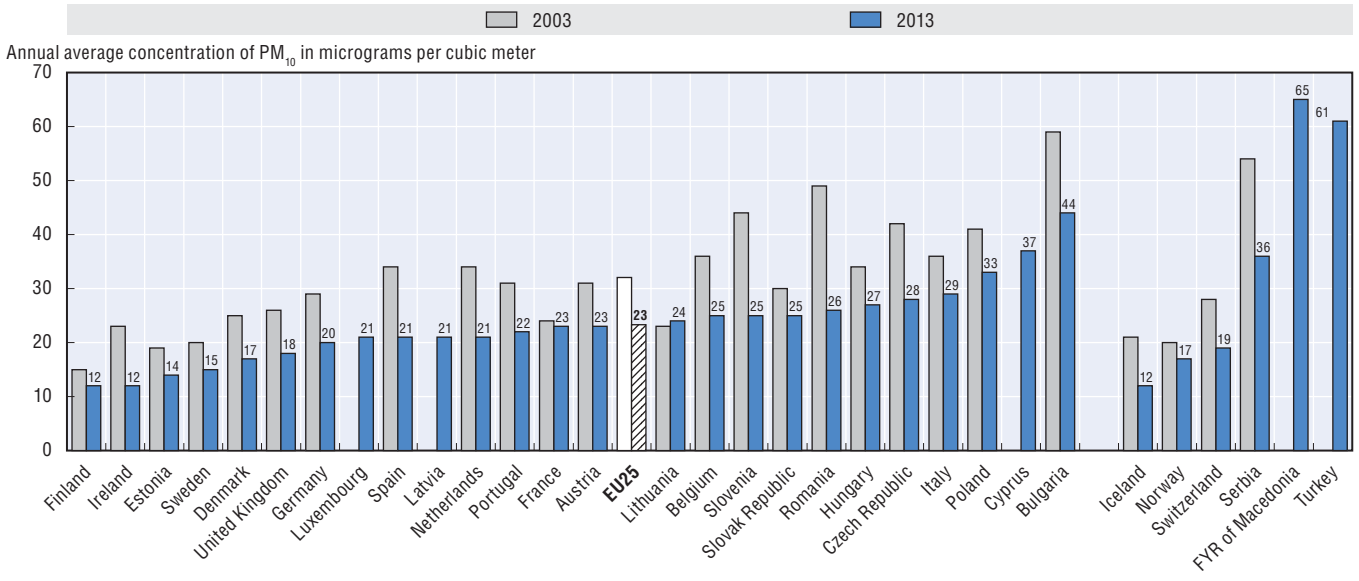
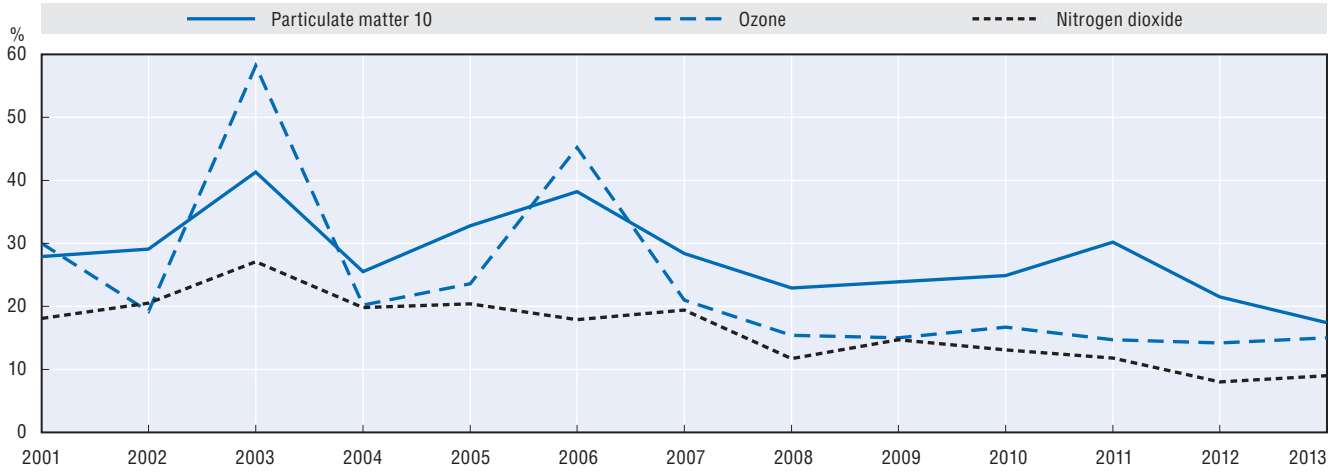
4.30. Urban population exposure to air pollution by particulate matter (PM_{10}), 2003 and 2013 (or nearest years)



Source: European Environment Agency (2015), *Air Quality in Europe – 2015 Report*.

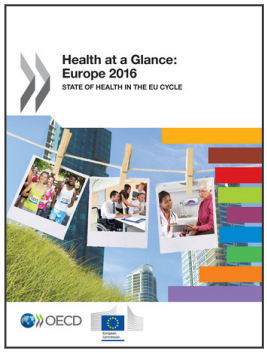
StatLink http://dx.doi.org/10.1787/888933429213

4.31. Percentage of the EU urban population exposed to air pollution exceeding EU air quality standards, 2001-13



Source: European Environment Agency (2015), *Air Quality in Europe – 2015 Report*.

StatLink http://dx.doi.org/10.1787/888933429228



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