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Air pollution and health in Wales

Outdoor air pollution is the largest environmental risk to health[1,2]. Pollutants such as fine particulate matter (called $PM_{2.5}$) and nitrogen dioxide (NO_2) can cause some health problems and make others worse. Breathing in these pollutants over several years can increase health risks from heart and lung diseases, and lung cancer.[2] There is also evidence that other body organs may also be affected, with possible effects on dementia, low birth weight and diabetes.[1] Shorter-term exposure symptoms can include eye, nose and throat irritation.[3]

The health effects of pollution depend on how much of it people are exposed to and for how long. Air pollution affects people in different ways; risks and impacts change over a lifetime too. Some, such as children, older people and those with heart or lung problems are more likely to be affected[4]. In particular, children can suffer from poor lung development and asthma symptoms because of air pollution exposure[5]. People who work in highly polluted places or who regularly travel in or through polluted areas (such as city centres) may be at higher risk of pollution-related health problems too.

People who live in the most deprived areas – where health and air quality tend to be poorest – are also more likely to be harmed by air pollution exposure[6,7]. In these areas, because deprivation and poor health influences can combine to make people less able to cope with or adapt to air pollution exposure, risks and impacts may be worse compared with elsewhere.

Estimating the health impact of air pollution is difficult. The UK expert Committee on the Medical Effects of Air Pollution (COMEAP) estimates that air pollution is responsible for "an effect equivalent of between 28,000 and 36,000 deaths (at typical ages) each year"[8]. This does not mean there are 'actual' deaths from air pollution exposure; rather, that the reduced life expectancy which everyone experiences because of air pollution exposure (6-8 months on average, but could range from days to years) is 'equivalent' to between 28,000 and 36,000 deaths when summed. In Wales, based on the latest data available (for 2017)[9], Public Health Wales estimates the burden of long-term air pollution exposure to be the equivalent of 1,000 to 1,400 deaths (at typical ages) each year.

This most recent impact estimate figure for Wales updates those published previously; this is necessary earlier figures were calculated using older methods where the risks and impacts from different pollutants were considered separately[10,11,12]. The estimates are now more accurate than they used to be because, through just one calculation, they account for the overlapping health effects of $PM_{2.5}$ and NO_2. However, because uncertainty remains around estimate calculations, COMEAP recommends presenting figures as a range rather than a central estimate. Also, since estimates are people and place-specific 'snapshots' – meaning they can offer a useful feel for the scale of air pollution problems in specific areas at certain times – it is worth noting that figures should not be compared across time or place.

In summary, while estimating the impact of air pollution exposure is an uncertain science, the evidence that air pollution can harm health is strong. Assessing and understanding air pollution risks is important, but doing so should not hold back action to improve air quality and public health.

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[1] PHE (2019). Review of interventions to improve outdoor air quality and public health. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/795185/Review_of_interventions_to_improve_air_quality.pdf
[2] WHO (2016). Ambient air pollution: a global assessment of exposure and burden of disease. https://www.who.int/publications-detail/ambient-air-pollution-a-global-assessment-of-exposure-and-burden-of-disease
[3] WHO (2013). Review of evidence on health aspects of air pollution. http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/publications/2013/review-of-evidence-on-health-aspects-of-air-pollution-revihaap-project-final-technical-report
[4] Welsh Government (2019). The Clean Air Plan for Wales consultation - Healthy Air, Healthy Wales. https://gov.wales/sites/default/files/consultations/2019-12/consultation-a-clean-air-plan-for-wales.pdf
[5] RCP/RCPCH (2018). Every breath we take – the lifelong impact of air pollution. https://www.rcplondon.ac.uk/file/every-breath-we-take-lifelong-impact-air-pollution-full-report
[6] European Environment Agency (2018). Unequal exposure and unequal impacts: social vulnerability to air pollution, noise and extreme temperatures in Europe. https://www.eea.europa.eu/publications/unequal-exposure-and-unequal-impacts
[7] Brunt H *et al.* (2017). Air pollution, deprivation and health: Understanding relationships to add value to local air quality management policy and practice in Wales, UK. https://academic.oup.com/jpubhealth/article/39/3/485/3076806
[8] COMEAP (2018). Associations of long-term average concentrations of nitrogen dioxide with mortality. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/734799/COMEAP_NO2_Report.pdf
[9] Welsh Government StatsWales. https://statswales.gov.wales/Catalogue/Environment-and-Countryside/Air-Quality/airqualityindicators
[10] PHE (2014). Estimating local mortality burdens associated with particulate air pollution. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf
[11] Welsh Government/PHW (2016). Working together to reduce air pollution, risks and inequalities. https://gov.wales/sites/default/files/publications/2019-06/working-together-to-reduce-outdoor-air-pollution-risks-and-inequalities.pdf
[12] Public Health Wales (2018). Making a difference – reducing health risks associated with road traffic air pollution in Wales. http://www.wales.nhs.uk/sitesplus/documents/888/PHW%20Air%20pollution%20report%20%28final%20English%29.pdf