

Breast Cancer UK Short Briefing | Air pollution

Air pollution is thought to contribute to more than 40,000 deaths each year in the UK (1). It has been linked to a range of illnesses and conditions, including lung cancer, asthma, stroke, heart disease and dementia. There is increasing evidence that links high levels of air pollution to breast cancer. More research is needed to prove the link conclusively.

Sources of air pollution

Road traffic, factories, power stations, waste plants (e.g. landfill and incinerators) and some farming activities can all contribute to **outdoor air pollution**. Common pollutants include particulate matter (fine particles, e.g. PM_{2.5} - 2.5 micrometres in size), carbon monoxide (CO), nitrogen oxides (NO_x) sulphur dioxide, ammonia, polycyclic aromatic hydrocarbons (PAHs) and suspended pesticide particles.

Indoor air pollution arises from building materials (e.g. asbestos fibres), fires, gas cookers and wood-burning stoves (that can emit PM_{2.5}, CO and NO₂), tobacco smoke, mould and chemicals released into the air from household items such as flame retardants in upholstery, and “endocrine disrupting chemicals” (also known as EDCs or hormone disrupting chemicals) from products such as air fresheners, kitchen cleaners and other sprays.

What is the evidence that air pollution is linked to breast cancer?

Some chemicals in polluted air are carcinogens (are known to cause cancer) e.g. benzene can cause breast cancer (2). Others are EDCs which have the ability to mimic the natural hormone, oestrogen. Oestrogen is known to increase breast cancer risk (3) and oestrogen mimics, which trigger similar reactions in the body, are also thought to increase risk. Particulate matter found in outdoor and indoor air pollution and EDCs such as phthalates, musks and alkylphenols in indoor air pollution may also act as oestrogen mimics (4), potentially increasing breast cancer risk. For more details about EDCs and oestrogen mimics, see our webpage on [EDCs](#).



Indoor air quality is affected by household product use ©PiccoloNamek

Several recent large-scale studies have identified a link between air pollution and breast cancer risk. A European study that examined long-term exposure to air pollution and postmenopausal breast cancer found evidence exposure to traffic-related nitrogen oxides was associated with increased incidence (5). US studies have suggested that long-term exposure to particulate matter and polycyclic aromatic hydrocarbons (6, 7) in polluted air are associated with a higher risk of breast cancer. Another study suggests that exposure to PM_{2.5} in air pollution contributes to higher breast density (8), a significant breast cancer risk factor. However, not all studies demonstrate a link between breast cancer and air pollution. A nationwide US study found no association between exposure to air pollutants during adulthood and risk of breast cancer (9). Differences may relate partly to timing of exposure, with early exposures potentially more significant.

How is air quality regulated?

Action to improve outdoor air quality is largely driven by EU legislation. Air quality directives set legally binding limits for levels of major air pollutants that impact public health. The UK has often been in breach of these limits in multiple areas across the country (10). Indoor air quality is more difficult to regulate, although recent bans on smoking in public places and in cars carrying children are examples of improved regulation. Some building regulations designed to improve energy efficiency, have made indoor air pollution worse by reducing ventilation. For more details, see our full brief on [air pollution](#).

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How can I reduce my exposure to air pollution ?

- Avoid jogging or walking along busy roads where possible, especially when forecasts indicate high pollution levels (you can check these on the [Defra website](#)).
- Minimise or avoid the use of garden and indoor pesticides.
- Do not smoke inside your home.
- Properly maintain boilers, stoves, fires and other appliances that burn fuel of any kind.
- Treat condensation and remove mould.
- Choose less flammable materials such as wool and cotton for home furnishings.
- Avoid synthetic fragrances used in cleaners, detergents, washing powders and air fresheners.
- Vacuum and damp dust regularly and avoid using chemical sprays to remove household dust

References

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Breast Cancer UK works to save lives and reduce breast cancer rates by tackling the environmental and chemical causes of the disease.

For further information on how harmful chemicals may be linked to breast cancer and full references please visit our website www.breastcanceruk.org.uk

To receive a large text version of this publication, please contact Breast Cancer UK.

Disclaimer

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