

JSNA Health and Wellbeing Profile 2023/24

Air Pollution

Summary points

- 5.7% of “all-cause adult mortality” in Bristol was considered attributable to “particulate air pollution” in 2021, higher than the England average of 5.5%

Health Impact

Air pollution generated from human sources such as the combustion of fuels for heat, electricity and transport is having an adverse effect on the health of Bristol’s communities. In 2021, 5.7% of “all-cause adult mortality” in Bristol was considered attributable to “particulate air pollution”¹, which is 0.2% higher than the national proportion (5.5%) (fig 1) and is mid-ranking for English Core Cities.

In addition, a local report² estimates that around 300 deaths each year in Bristol can be attributed to exposure to both nitrogen dioxide (NO₂) and fine particulate matter. This represents about 8.5% of deaths in Bristol being attributable to air pollution. [NB this is higher as the local report considers NO₂ as well].

The proportions of deaths attributable to air pollution vary across the city in relation to pollutant concentrations, from around 7% in some wards to around 10% in others. Concentrations are highest in the centre of the city and therefore so are deaths attributable to air pollution.

Long-term exposure to air pollution contributes to the development of cardiovascular disease, lung cancer and respiratory disease³. Those at particular risk include children aged 14 and under, older people aged 65 and over, pregnant women and not unexpectedly people with pre-existing respiratory or heart conditions⁴. Lower socio-economic communities suffer the greatest consequences of air pollution⁵.

¹ [Public health profiles - OHID \(phe.org.uk\)](https://publichealthprofiles.org.uk/)

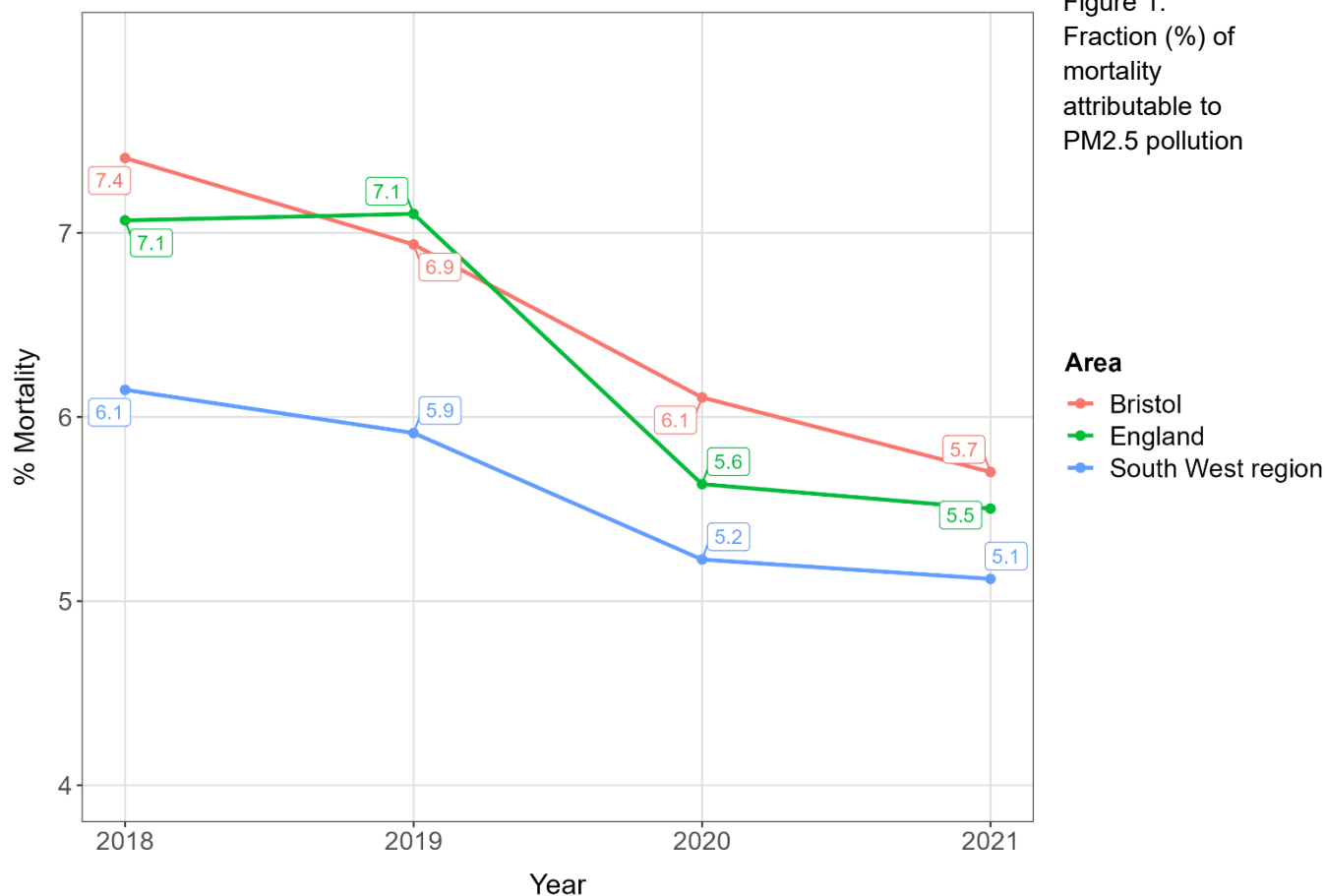
² Air Quality Consultants (2017). [Health Impacts of Air Pollution in Bristol](#)

³ World Health Organization (2016). [Ambient \(outdoor\) air quality and health factsheet](#) (accessed 23.11.16)

⁴ National Institute for Health and Care Excellence (2015). Air pollution – outdoor air quality and health. Final scope. London: NICE

⁵ Marmot, M (2010). Fair Society Healthy Lives. Marmot Review.

Public Health: SPAR.net Air Pollution Indicator

Fraction (%) of mortality attributable to PM_{2.5} (new method)

Fingertips Public Health Data

A Clean Air Zone was introduced in November 2022 to reduce traffic generated NO₂ as soon as possible. Government will report on this in 2024.

Air Quality Management

Road transport is a major source of particulate matter and nitrogen oxides (NO_x) accounting for 34% of nitrogen oxides and 12% of primary particulate matter (PM_{2.5}) emissions in the UK⁶. At busy roadside locations the contribution of traffic to nitrogen oxides can be greater than 80%.

Through monitoring of the city's air quality, a geographical area has been identified where health based air quality standards (known as objectives) are not achieved and an Air Quality Management Area (AQMA) has been established in line with DEFRA (Department for Environment and Rural Affairs) recommendations.

Fig 2 indicates the boundary of the Air Quality Management Area (AQMA) for Bristol, inside which air quality is at risk of exceeding government objectives.

⁶ Department for Environment, Food and Rural Affairs (2018). Clean Air Strategy 2018.

The AQMA is based around busy road junctions and arterial roads where nitrogen dioxide from the exhausts of vehicles does not get readily dispersed because of the surrounding buildings.

Domestic solid fuel (wood) burning is a re-emerging area of concern. Recent evidence shows that this source accounts for 21% of all PM_{2.5} emissions nationally⁷. BCC has published research to identify possible policies for mitigating emissions of PM_{2.5}. [Air quality \(bristol.gov.uk\)](https://www.bristol.gov.uk/air-quality)

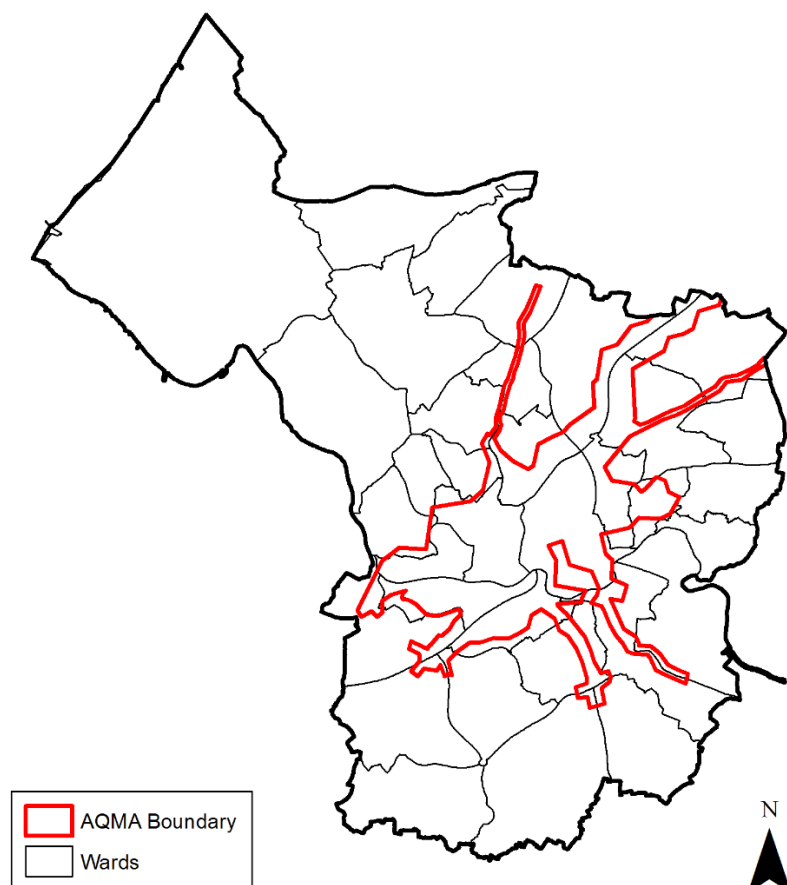
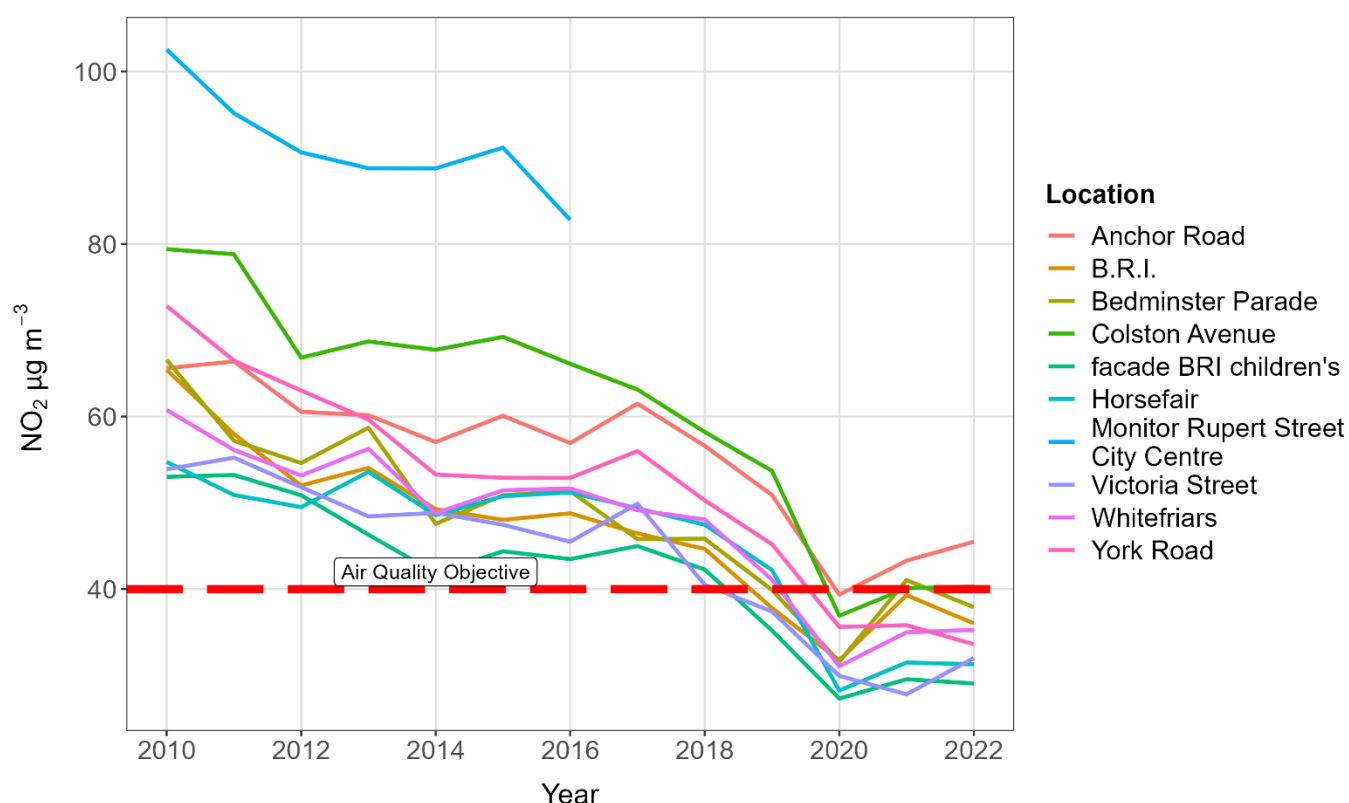


Figure 2: Air Quality Management Area (AQMA) boundary

Trends in Nitrogen Dioxide

The chart overleaf (Fig 3) shows trends for NO₂ at a selection of city centre monitoring sites. Concentrations are declining but remain above legal limits at some locations. The Clean Air Zone will accelerate progress towards compliance. The red line at 40µgm⁻³ represents the annual EU and UK objective for nitrogen dioxide.

⁷ [Emissions of air pollutants in the UK – Particulate matter \(PM10 and PM2.5\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/emissions-of-air-pollutants-in-the-uk-particulate-matter-pm10-and-pm25)

NO₂ trends at diffusion tube sites: Central

Bias adjusted and annualised, not distance adjusted

Fig 3 Trends in Nitrogen Dioxide at city centre monitoring sites

Equalities

Black, Asian and Minority Ethnic (BAME) people make up a larger proportion of the population living in the more polluted areas – the AQMA – than the city as a whole and therefore it is reasonable to assume that they experience greater exposure to air pollution. Successful interventions to improve air quality should contribute to improving the citywide health of Black, Asian and minority ethnic people. An equalities impact assessment in the [final business case](#) for the scheme summarised the equalities impact for the Clean Air Zone.

Covid-19 impact:

Air quality (NO₂) improved across the city during lockdowns in 2020 and 2021 due to the reduction of vehicles on the road but recent monitoring indicates that several locations continue to experience illegal levels of NO₂. The introduction of the Clean Air Zone in November 2022 will help to reduce NO₂ as noted in the report above.

Further data / links / consultations:

- [Air Quality open data](#)
- [Air Quality Dashboard](#)

Date updated: April 2023

Date of next update: June 2024