

# JSNA Health and Wellbeing Profile 2024/25

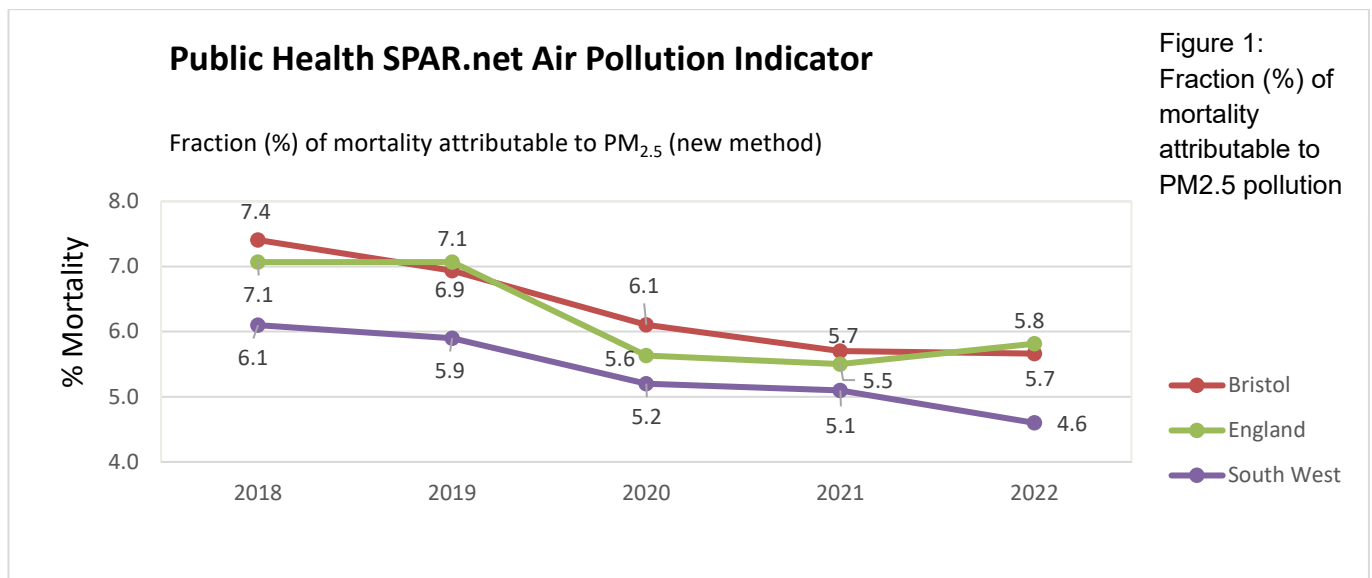
## Air Pollution

### Summary points

- 5.7% of “all-cause adult mortality” in Bristol was considered attributable to “particulate air pollution” (PM) in 2022, lower than the England average of 5.8%

### 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 2022, 5.7% of “all-cause adult mortality” in Bristol was considered attributable to “particulate air pollution”<sup>1</sup>, which is 0.1% lower than the national proportion (5.8%) (fig 1) and is mid-ranking for English Core Cities.



There is increasing evidence showing health effects of exposure to lower levels of pollutants, and no obvious thresholds have been detected for the effects for air pollution at a population level. This evidence has been reflected by the updated World Health Organisations (WHO) Global Air Quality Guidelines published in 2021. WHO’s annual average air quality guidelines were reduced from 10 to 5 µg/m<sup>3</sup> for fine particulate matter (PM<sub>2.5</sub>) and 40 to 10 µg/m<sup>3</sup> for NO<sub>2</sub>. The absence of thresholds of effect for common air pollutants is likely to be partly due to variability between individuals’ sensitivity to the pollutants studied<sup>2</sup>.

Long-term exposure to air pollution contributes to the development of cardiovascular disease, lung cancer and respiratory disease<sup>3</sup>. Those at particular risk include children aged 14 and under,

<sup>1</sup> [Public health profiles - OHID \(phe.org.uk\)](https://phe.org.uk/public-health-profiles)

<sup>2</sup> Chief Medical Officer’s annual report (2022): Air Pollution. [Chief Medical Officer’s Annual Report 2022 \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk)

<sup>3</sup> World Health Organization (2016). [Ambient \(outdoor\) air quality and health factsheet](https://www.who.int/publications/item/ambient-outdoor-air-quality-and-health-factsheet) (accessed 23.11.16)

older people aged 65 and over, pregnant women and not unexpectedly people with pre-existing respiratory or heart conditions<sup>4</sup>.

There is evidence that short-term exposure to PM is associated with hospital admissions for respiratory conditions. The US Environmental Protection Agency (US EPA) has an Integrated Science assessment for PM which concluded that short-term exposures to PM<sub>2.5</sub> are likely to be causally associated with respiratory effects, particularly exacerbations of asthma and chronic obstructive pulmonary disease (COPD) and respiratory-related diseases. Short-term exposure to PM<sub>2.5</sub> causes cardiovascular effects, with the strongest evidence from epidemiological studies for ischaemic heart disease, stroke and heart failure emergency department and hospital admissions, along with cardiovascular-related mortality<sup>5</sup>.

Areas of high deprivation frequently have higher levels of traffic or industrial activities, and these more heavily polluted areas may be more affordable to live in. People in lower socio-economic groups are more likely to have pre-existing health conditions earlier in life, and the higher exposures to air pollution may add to the greater burden of poor health. Studies of hospital admissions and mortality show increased health risks associated with exposure to air pollution among those living in areas of higher socio-economic deprivation<sup>5</sup>.

A Clean Air Zone was introduced in November 2022 to reduce traffic generated NO<sub>2</sub>, to achieve compliance with legal limits for this pollutant as soon as possible. Government will report on the impact that the CAZ has had on NO<sub>2</sub> pollution levels in 2024.

### **Air Quality Management**

Road transport is a major source of particulate matter and nitrogen oxides (NO<sub>x</sub>) accounting for 34% of nitrogen oxides and 12% of primary particulate matter (PM<sub>2.5</sub>) emissions in the UK<sup>5</sup>. 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.

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.

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

<sup>5</sup> Chief Medical Officer's annual report (2022): Air Pollution. [Chief Medical Officer's Annual Report 2022 \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/108144/cmo-annual-report-2022-air-pollution.pdf)

Domestic solid fuel (wood) burning is a re-emerging area of concern. Recent evidence shows that this source accounts for 22% of all PM<sub>2.5</sub> emissions nationally<sup>6</sup>. BCC has published research to identify possible policies for mitigating emissions of PM<sub>2.5</sub>. [Air quality \(bristol.gov.uk\)](https://www.bristol.gov.uk/air-quality)

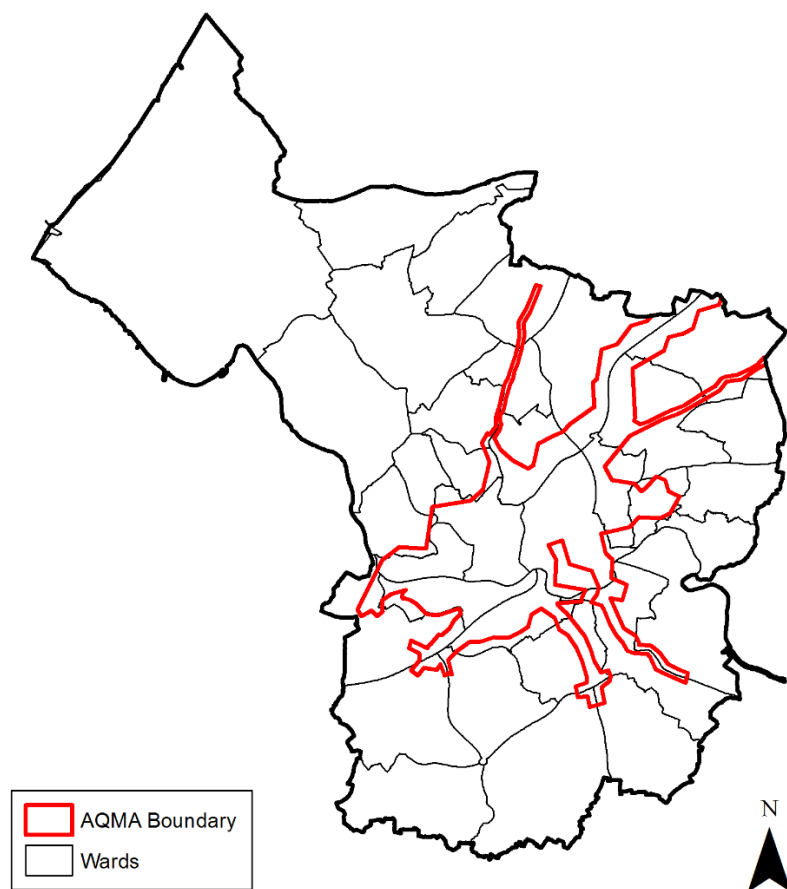


Figure 2: Air Quality Management Area (AQMA) boundary

### Trends in Nitrogen Dioxide

The chart overleaf (Fig 3) shows trends for NO<sub>2</sub> at a selection of city centre monitoring sites. Concentrations are declining and 2023 is the first year in which all of these sites achieved compliance with legal limits. The red line at 40µgm<sup>-3</sup> represents the annual EU and UK objective for nitrogen dioxide.. The Clean Air Zone is designed to accelerate progress towards compliance across the city.

<sup>6</sup> [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)

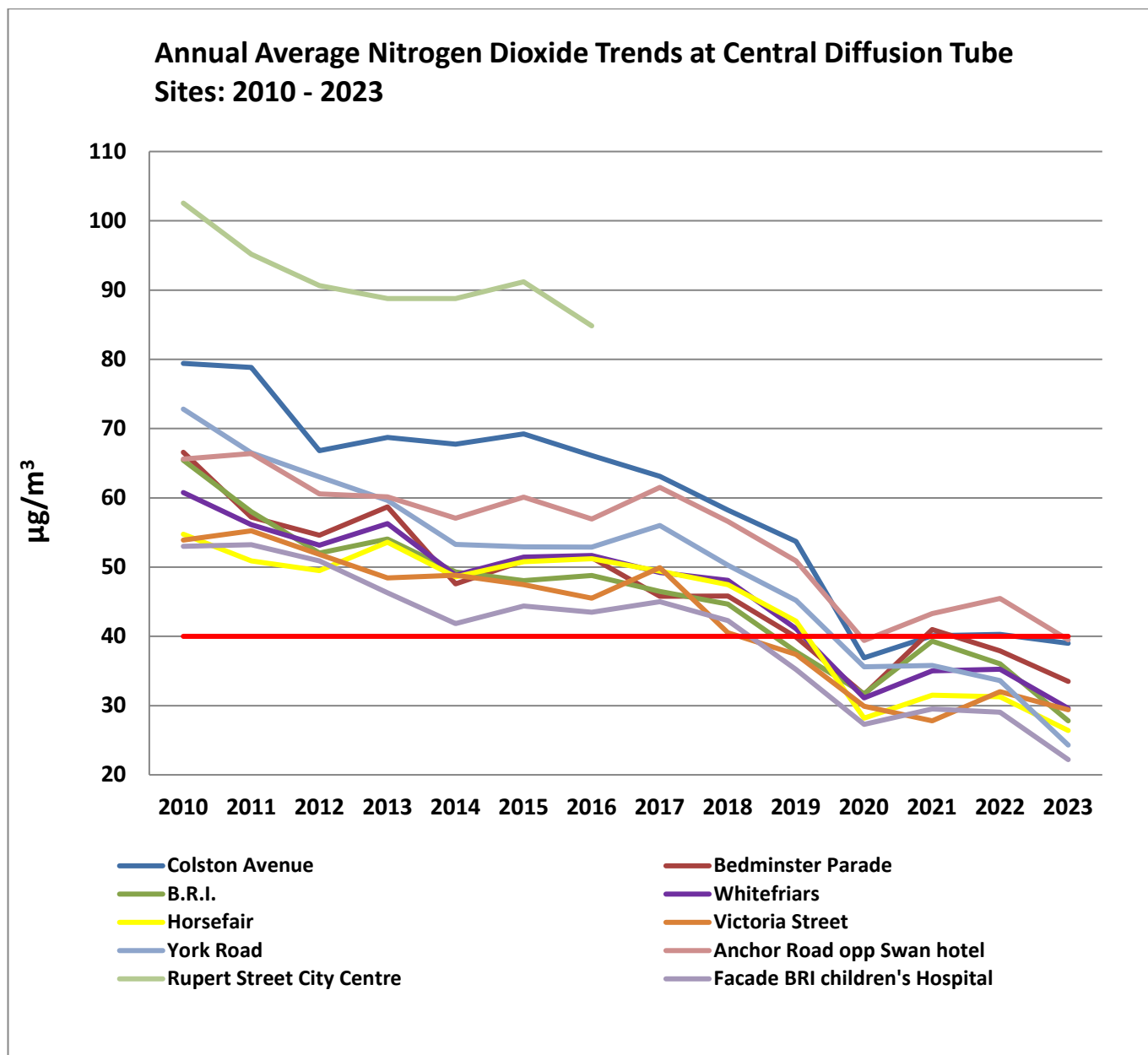


Fig 3 Trends in Nitrogen Dioxide at city centre monitoring sites

**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 (NO<sub>2</sub>) 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 NO<sub>2</sub>. The introduction of the Clean Air Zone in November 2022

will help to reduce NO<sub>2</sub> as noted in the report above. Full impacts of the CAZ on NO<sub>2</sub> concentrations in the first year of operation will be reported in 2024.

**Further data / links / consultations:**

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

**Date updated:** April 2024

**Date of next update:** April 2025