

JSNA Health and Wellbeing Profile 2026/27

Air Pollution

Summary points

- 5.0% of “all-cause adult mortality” in Bristol was considered attributable to “particulate air pollution” (measured as fine particulate matter, PM_{2.5}) in 2024, lower than the England average of 5.3%.
- After the introduction of the Clean Air Zone in November 2022, on average, across 193 monitoring locations, nitrogen dioxide (NO₂) pollution levels fell by 13.2% in 2023 when compared to 2022. NO₂ levels continued to improve in 2024 when compared to 2023, but at a slower rate.
- BCC is currently developing a strategy and action plan to work towards healthy air pollution levels across the city. This will recognise that current UK legislation on air pollution, does not reflect the latest health evidence, and is not stringent enough to protect health.

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 2024, 5.0% of “all-cause adult mortality” in Bristol was considered attributable to “particulate air pollution”¹, which is 0.3% lower than the national proportion (5.3%) (fig 1) and is mid-ranking for English Core Cities.

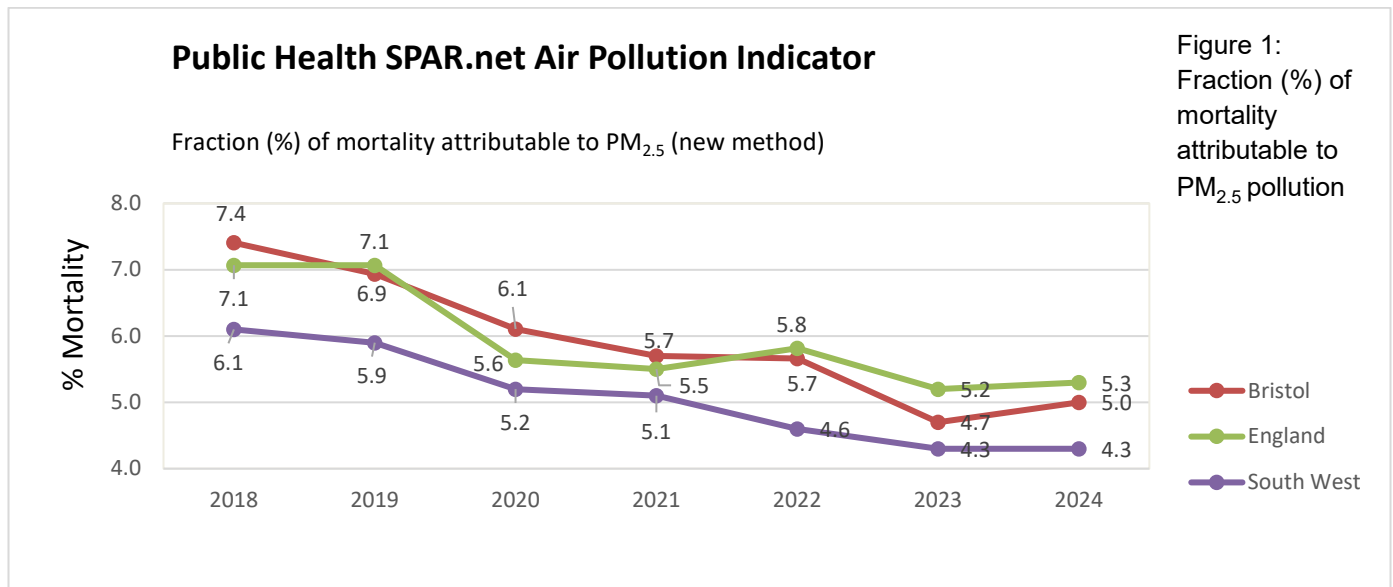


Figure 1: Fraction (%) of mortality attributable to PM_{2.5} pollution

Caution is needed when considering apparent trends over time. Trend data should not be overinterpreted for a number of reasons:

- Concentrations of PM_{2.5} vary from year to year due to the weather. This variation due to weather is generally greater than the year to year variation from changes in emissions.

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

- The methods and data inputs for the pollution modelling are continually updated and improved.

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 $\mu\text{g}/\text{m}^3$ for fine particulate matter (PM_{2.5}) and 40 to 10 $\mu\text{g}/\text{m}^3$ for NO₂. The absence of thresholds of effect for common air pollutants is likely to be partly due to variability between individuals' sensitivity to the pollutants studied².

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 people with pre-existing respiratory or heart conditions⁴.

There is evidence that short-term exposure to particulate matter (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_{2.5} 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_{2.5} 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 mortality⁵.

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 deprivation⁵.

A Clean Air Zone was introduced in Bristol in November 2022 to reduce NO₂ concentrations, to achieve compliance with legal limits for this pollutant as soon as possible. Monitoring data in 2023 demonstrated that average NO₂ concentrations, across 193 locations, fell by 13.2% when compared to 2022. NO₂ levels continued to improve in 2024 when compared to 2023, falling by on average, 4.7% across 191 monitoring sites. In recognition of the need to lower air pollution levels further to achieve 'healthy air,' Bristol City Council are currently developing a strategy and action plan, which will consider ways to reduce air pollution from a wide range of sources.

² Chief Medical Officer's annual report (2022): Air Pollution. [Chief Medical Officer's Annual Report 2022](#)

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

Air Quality Management

Road transport is a major source of particulate matter and nitrogen oxides (NOx) accounting for 30% of NOx and 21% of particulate matter (PM_{2.5}) emissions in the UK in 2024. At busy roadside locations, the contribution of traffic to nitrogen oxide levels can be greater than 80%. Emissions of particulate matter from vehicle exhausts have fallen significantly as vehicles have become cleaner. This means that most PM emissions from road transport now come from non-exhaust emissions (brake, tyre and road surface wear)⁵.

Domestic solid fuel (wood) burning is a re-emerging area of concern. National data shows that this source accounted for 20% of all PM_{2.5} emissions in 2024⁵. 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)

Trends in Nitrogen Dioxide

Figure 2 below shows trends for NO₂ at a selection of city centre monitoring sites. 2023 was the first year in which all, with the exception of the Co-located Colston Avenue site, achieved compliance with legal limits. Three locations have seen a slight worsening of NO₂ concentrations in 2024 compared to 2023, the rest have continued to fall. The red line at 40µgm⁻³ represents the annual EU and UK objective for nitrogen dioxide.

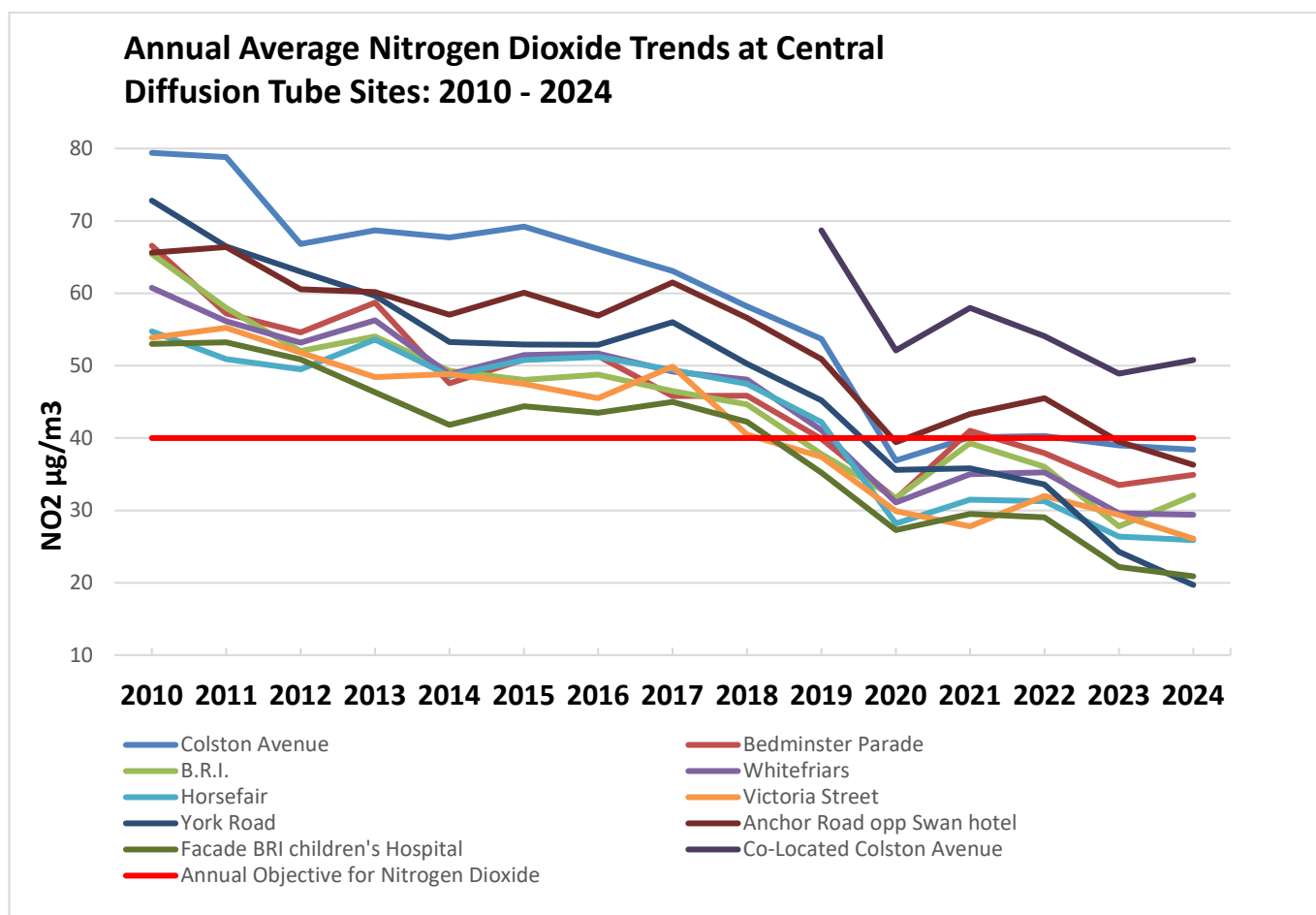


Fig 2 Trends in Nitrogen Dioxide at city centre monitoring sites

⁵ [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)

Equalities: Black, Asian and Minority Ethnic (BAME) people make up a larger proportion of the population living in the more polluted parts of 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.

Clean Air Zone:

The Clean Air Zone is designed to accelerate progress towards compliance across the city and as a result, improve public health. The introduction of the Clean Air Zone in November 2022 has helped to reduce NO₂ as noted in this report. Whilst NO₂ concentrations have fallen, a small number of locations continue to exceed current legal limits.

Healthy Air Strategy and Action Plan:

In recognition that the current legally required air pollution limits are not stringent enough to result in pollution levels that can be considered healthy, Bristol City Council is currently developing a strategy and action plan to reduce pollution levels further.

Further data / links / consultations:

- Bristol: [Air Quality open data](#)
- Bristol: [Air Quality Dashboard](#)
- WECA: [Air quality measurements — Open Data Portal](#)

Date updated: May 2026

Date of next update: May 2027