

# JSNA Health and Wellbeing Profile 2023/24

## Respiratory Disease

### Summary points

- More than 100 Bristol residents die prematurely each year from respiratory disease and it is the cause of 1 in 11 premature deaths in the city (deaths before 75 years of age).
- The risk of premature mortality from respiratory disease in Bristol is higher than the national average and has been for the majority of the past 20 years. There seems to be a long term decline in this risk over the past 20 years but with some considerable volatility in rates year to year.
- As far as we know from the data available the risk of premature mortality from respiratory disease in Bristol over the past 20 years, and at present remains considerably higher for men than women.
- During the years most affected by the Covid-19 pandemic (2020/21 – 2022/23) premature mortality from respiratory illness appears to have declined noticeably. This is likely to be related to aspects of the pandemic and the response to it.
- More than half of the premature mortality reported due to respiratory illness in Bristol is the result of COPD more specifically, and the latest data indicates that more than 9,000 residents are recorded on their GP practice's COPD disease register with the condition diagnosed. 1 in 5 of the emergency admissions for respiratory illness in the city was due to COPD 2020/21 to 2022/23.
- The latest data indicates that more than 32,000 residents (aged 6 years or over) are recorded on their GP practice's asthma disease register with the condition diagnosed. 1 in 11 of the emergency admissions for respiratory illness in the city was due to asthma 2020/21 to 2022/23, and this outcome is much more common for women than men in the city.
- There are strong and consistent social gradients in the risk of emergency admission due to respiratory illness, COPD and asthma in Bristol, where those living in the most deprived areas of the city are at a markedly higher risk of admission to hospital due to these illnesses.
- The incidence of respiratory disease in general, and chronic obstructive pulmonary disease (COPD) and asthma more specifically when analysed by ward of residence within Bristol appears to be greatest in more deprived areas where smoking rates tend to be higher on average, and is likely to be related in part to historical patterns of smoking in the city associated with the tobacco industry as well as the varying effects of poor air quality across the city.

### Respiratory disease

An average of 105 Bristol residents die prematurely (under 75yrs old) each year from respiratory disease (2015 to 2022). This represents around 9% of all premature deaths in the city during this period.

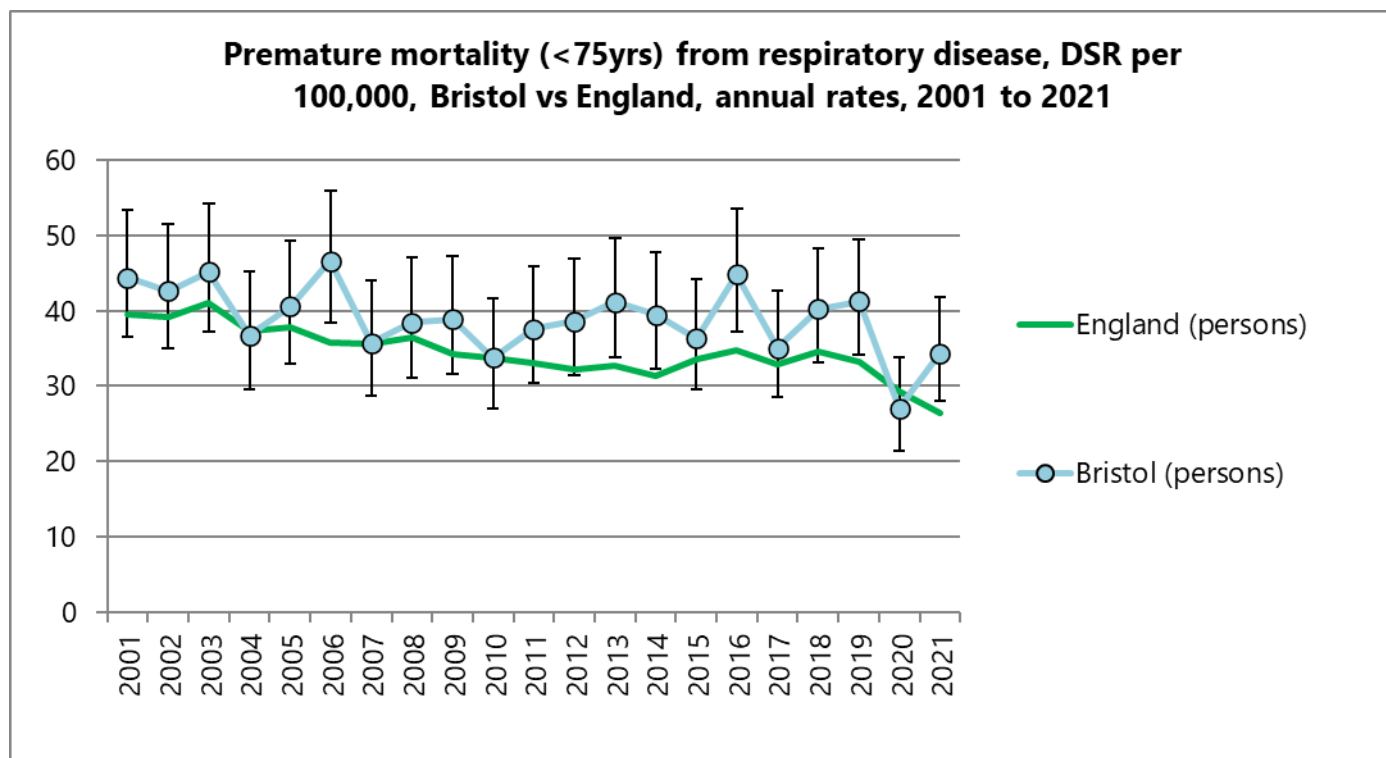


Figure 1: Premature mortality (<75yrs) from respiratory disease, DSR per 100,000, Bristol vs England, annual rates, 2001 to 2021. Source: Office for Health Improvement & Disparities Fingertips tool.

Normally we would expect to update and share a chart like the one above based on pooled data for 3-years of mortality, rather than annual rates as shown in figure one, as it tends to smooth out some of the volatility associated with short time periods and allows us to appreciate longer term trends within that volatility more easily. Due possibly to the short term impacts of the Covid-19 pandemic on trends since 2020, the Office for Health Improvement & Disparities have not updated the 3-year pooled statistics since 2017-2019 and so the trend analysis here to 2021 and 2022 relies on just annual data.

Allowing for this volatility it is still clear that for the majority of this 21-year period the rate of respiratory premature mortality in Bristol has been higher than the national average, the standardisation of these statistics adjusting as much as is possible for the differences in population structure between the two populations being compared. In all but 4-years the rate in Bristol was noticeably higher than the national average, and in six years the Bristol mortality rate was significantly higher than the national rate (2006, 2013, 2014, 2016, 2019 and 2021). It is not necessarily very clear from central section of this time period, but overall there is a decline in the mortality rates presented between 2001 and 2021, nationally and in Bristol, albeit a far from steady or gradual one.

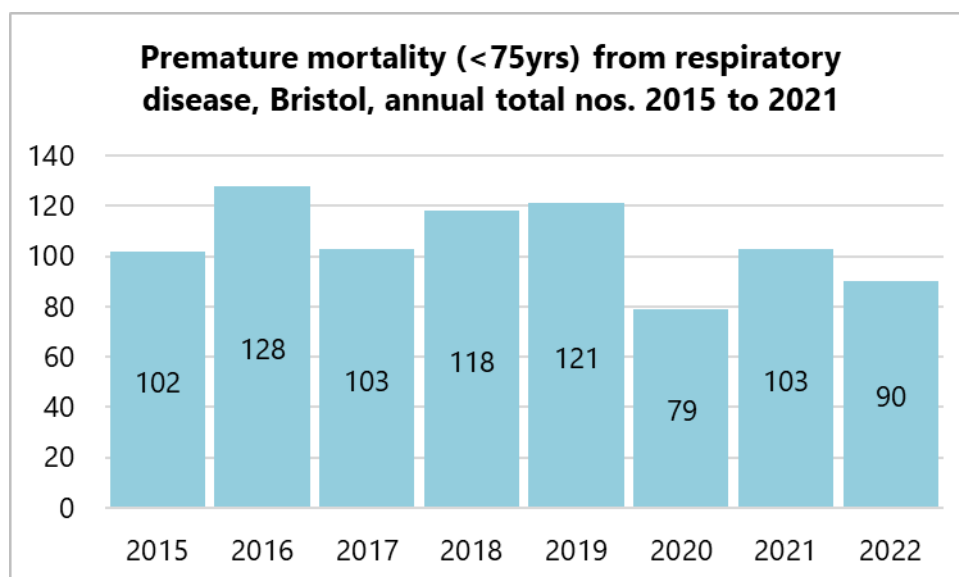
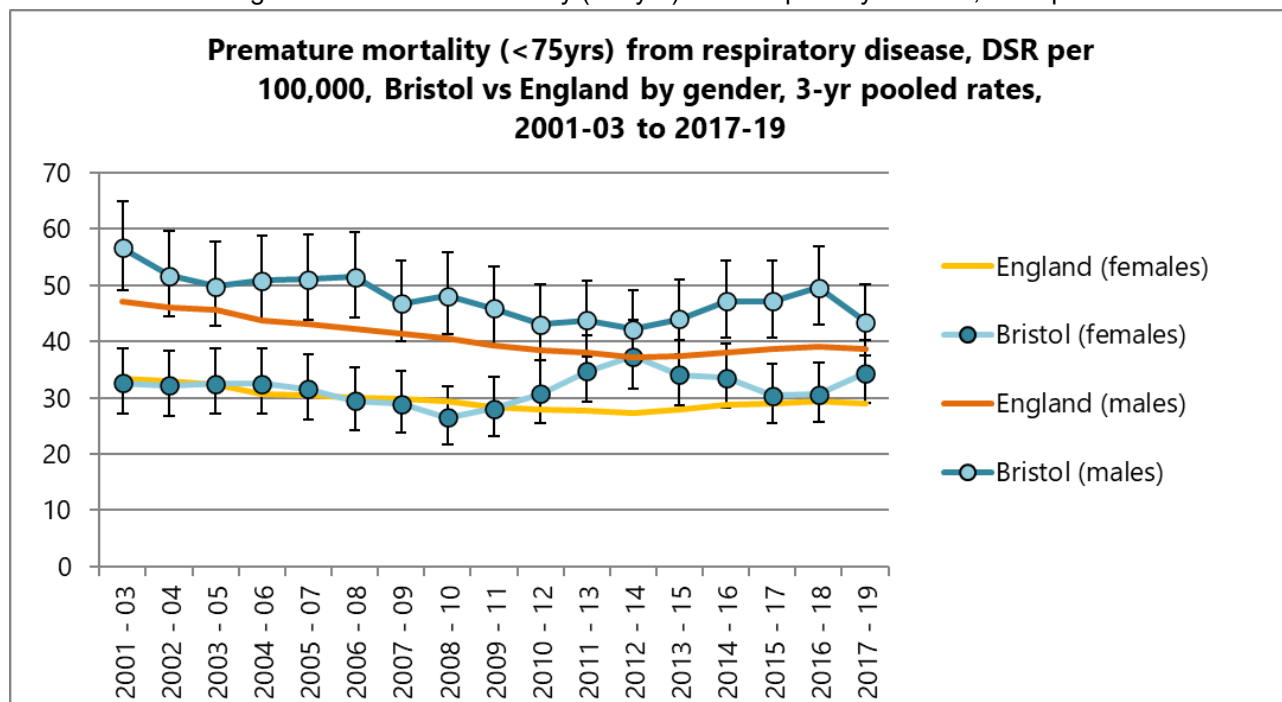


Figure 2: Premature mortality (<75yrs) from respiratory disease, Bristol residents, annual total numbers. Source: Primary Care Mortality Dataset (PCMD), NHS England – Data collated by Public Health, Bristol City Council

Covid-19 pandemic appears to have some impact on mortality rates from respiratory illness in Bristol since 2020. Covid-19 infection can express itself in terms of damaging the respiratory system, but just a very small number of those included in this measure since 2020 also had Covid-19 at the time of death, the vast majority of these deaths were unrelated to Covid-19 and most Covid-19 deaths are not counted within the respiratory illness total. In the three years 2017 to 2019 there were 342 premature deaths of Bristol residents caused by respiratory disease. During the three years subsequent to that and including the main impacts of the Covid-19 pandemic; 2020 to 2022, there were 272 of these deaths, a decline of 20% in numbers. It is possible that the apparent reduction in mortality risk from respiratory illness 2020 to 2022 relates to the reduction in social contact and mixing associated with Covid-19 mitigation and behavioural changes in the population during this time.

Figure 3: Premature mortality (<75yrs) from respiratory disease, DSR pe



100,000, Bristol vs England, annual rates, 2001-03 to 2017-19. Source: Office for Health Improvement & Disparities Fingertips tool.  
 \*DSR – Directly Standardised Rate

**Gender:** Our comparisons between the premature respiratory mortality risk for men and women in Bristol, and the national average, are limited to pre-2020 due to the availability of data from the Office for Health Improvement & Disparities, as shown in figure three above. In Bristol and nationally, men are at more risk of premature death from respiratory disease, but that gap has narrowed overall during the last 20 years. The premature mortality rates for men in Bristol appear to have declined during the period of this chart as a whole, but for women in the city there has been no long term decline of this sort, hence the closing gap between men and women’s rates. After many years of decline to 2012-14, both the national and Bristol premature mortality rates for men from respiratory illness started to rise again for around 4 years to 2016-18. The latest data for 2017-19 shows a decline, however. The premature mortality rates for females from respiratory illness in Bristol have been a mirror image of those for males since 2012-14, declining for a few years before rising again in the latest 3 to 4 years. In the latest 3-year period reported 2017-19 there was not a statistically significant difference between the premature mortality rates from respiratory illness for female and male residents in Bristol.

**Deprivation:** Chronic obstructive pulmonary disease (COPD) is one of the main causes of respiratory disease deaths, and is strongly associated with the prevalence of smoking, as is the case with the incidence and severity of many other respiratory illnesses. Figure four below shows the percentage contribution of respiratory disease to the overall burden of premature mortality in Bristol wards. This contribution appears to be greatest in more deprived areas (where smoking rates tend to be higher on average). During 2018 to 2022, 11% of premature mortality in the most deprived 20% of the city was caused by respiratory illness, compared to 5% in the least deprived 20%.

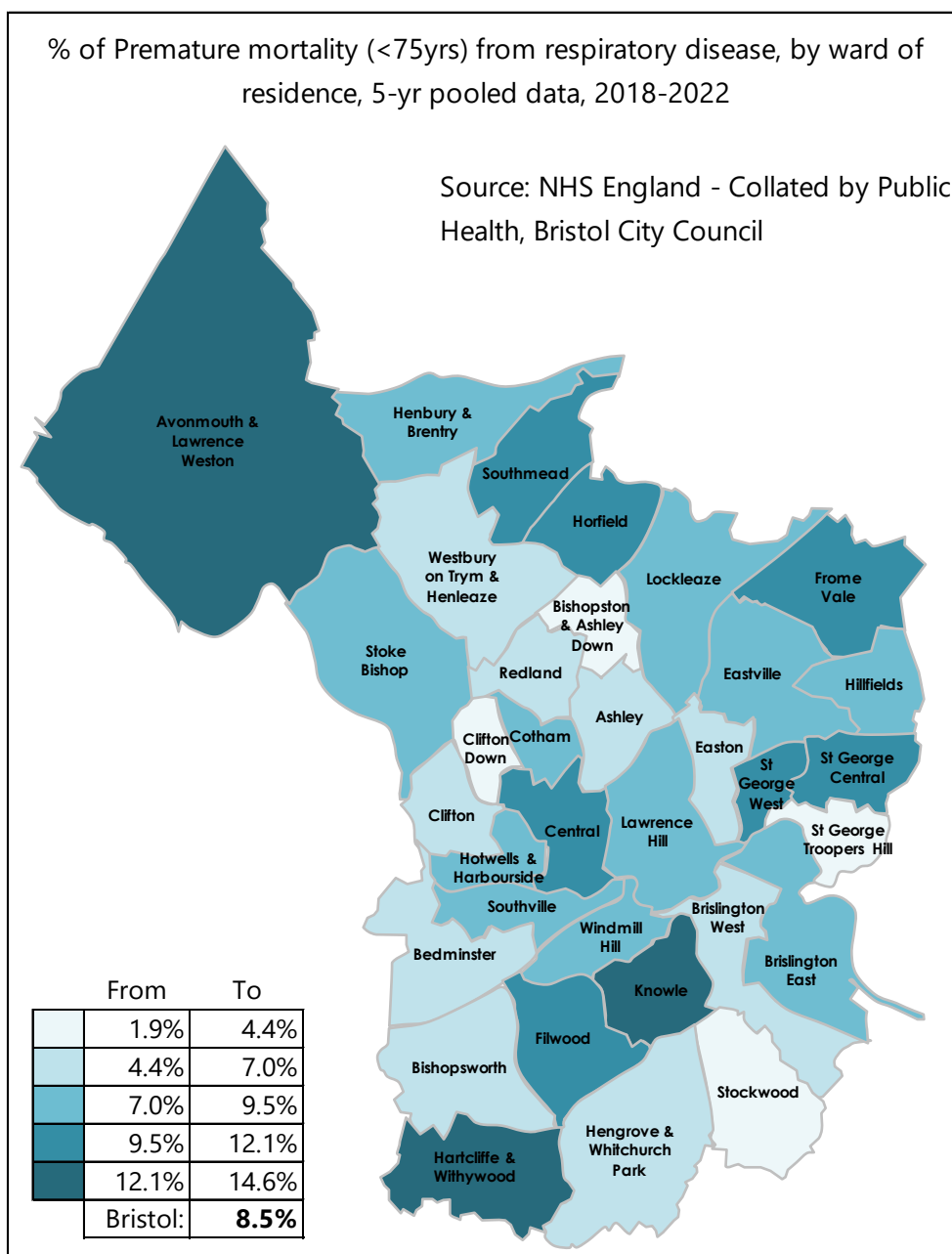


Figure 4: % of Premature mortality (<75yrs) from respiratory disease, by ward of residence, 5-yr pooled data, 2018-2022. Source: Primary Care Mortality Dataset (PCMD), NHS England – Data collated by Public Health, Bristol City Council

An analysis of emergency hospital admissions related to respiratory illness in Bristol in 2020/21 to 2022/23 showed that 29% of these admissions were for residents living in the most deprived 20% of the city. Those living in the least deprived 20% were responsible for just 12% of admissions. Figure five below shows that the risk of admission for respiratory illness during that period was associated with deprivation in Bristol. This is likely to be the result from variation in the underlying prevalence of respiratory illness and its risk factors, as well as the effectiveness of the management of patients to avoid hospital admissions.

Comparing the social gradient in emergency admissions related to respiratory illness for the three-year period just prior to the Covid-19 pandemic, to the three year period including the pandemic (2020/21 – 2022/23), in the chart below it is apparent that the social gradient (the association between deprivation and the risk of admission) is present in both periods.

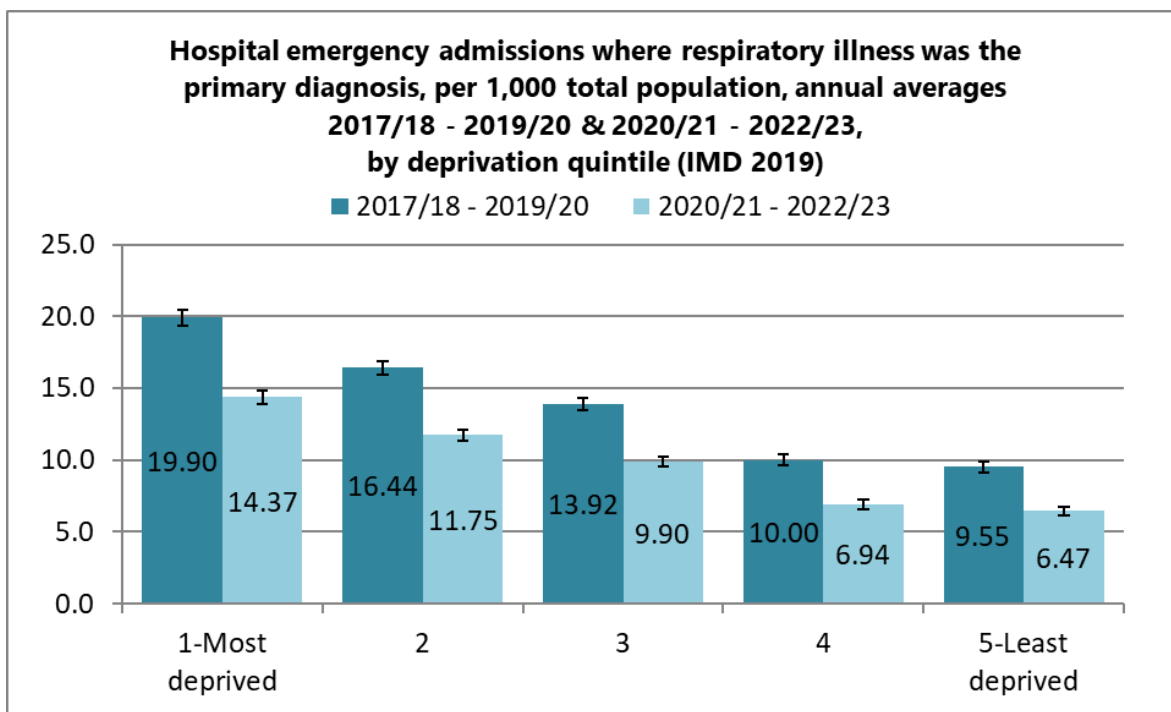


Figure 5: Rate of emergency hospital admission for respiratory illness, per 1,000 residents (all ages), 2017/18 - 2019/20 & 2020/21 – 2022/23, by deprivation quintile (IMD 2019). Source: Hospital Episode Statistics (NHS Digital) collated by Public Health, Bristol City Council.

The difference over time apparent in the chart above is likely to be related to the same factors described in respect of the fall in respiratory illness (excluding Covid-19) caused premature mortality observed to 2021; reduced risk of infectious respiratory illness through decreased social mixing and other infection mitigation measures, and increased vigilance for respiratory symptoms, and potentially a reduced access to acute care at times during the pandemic.

### Chronic obstructive pulmonary disease (COPD)

During 2015 to 2022, 54% of premature mortality from respiratory disease in Bristol resulted from chronic pulmonary obstructive disease, around 1 in 20 of all premature deaths in the city.

In 2022/23, 9,302 patients at Bristol GP practices were registered on their practice’s COPD register<sup>1</sup>. The percentage of registered patients (1.7%) was significantly lower than the national average (1.8%) for the latest year of QOF data (2022/23). Within Bristol, the percentage is highest in the south of the city (2.3% 2022/23). Higher levels of cigarette smoking in the south of the city historically, may help to explain this variation across the city.

<sup>1</sup> Quality and Outcomes Framework (QOF) data, accessed via NHS Digital: <https://qof.digital.nhs.uk/>

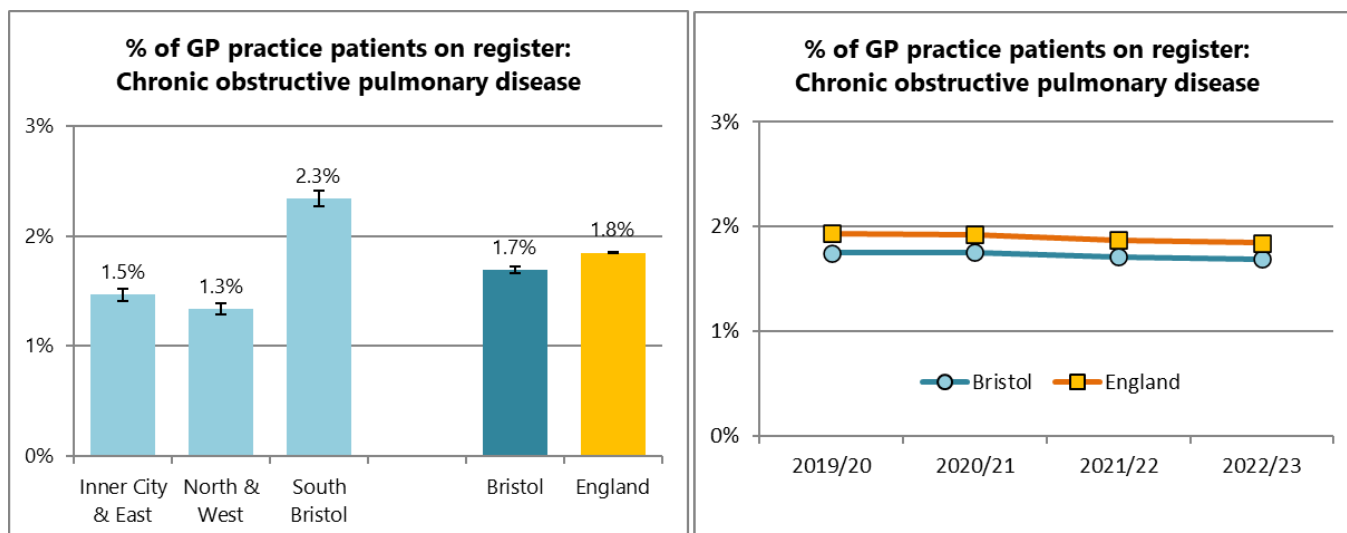


Figure 6: % of GP practice patients on register: COPD. Bristol and Bristol GP localities vs England average 2022/23. Bristol and England average trends 2019/20 to 2022/23. Source: NHS Quality and Outcomes Framework (QOF) 2022/23.

As was previously noted, COPD is a significant contributor to overall respiratory illness in the city; 21%, just over 1 in 5 emergency admissions of Bristol residents during 2020/21 to 2022/23 for respiratory illness was due to COPD in particular. When respiratory admissions fell most notably during the Covid-19 pandemic, this contribution was at its highest; 24% in 2020/21 and 21% in 2021/22 before declining back to 19% by 2022/23.

Due largely to the considerable role of smoking as a risk factor for COPD, this contribution was greatest in the south of the city, particularly in some of the more deprived wards (Filwood, Hartcliffe & Withywood and Stockwood), but also in less deprived Southville. In the most deprived 20% of Bristol, the contribution of COPD admissions was more than twice that seen in the least deprived 20% (25% vs 12%). The rate of emergency admissions due to COPD was also very strongly associated with deprivation. During 2020/21 to 2022/23 it was more than four times higher in the most deprived 20% of Bristol than the least deprived 20%.



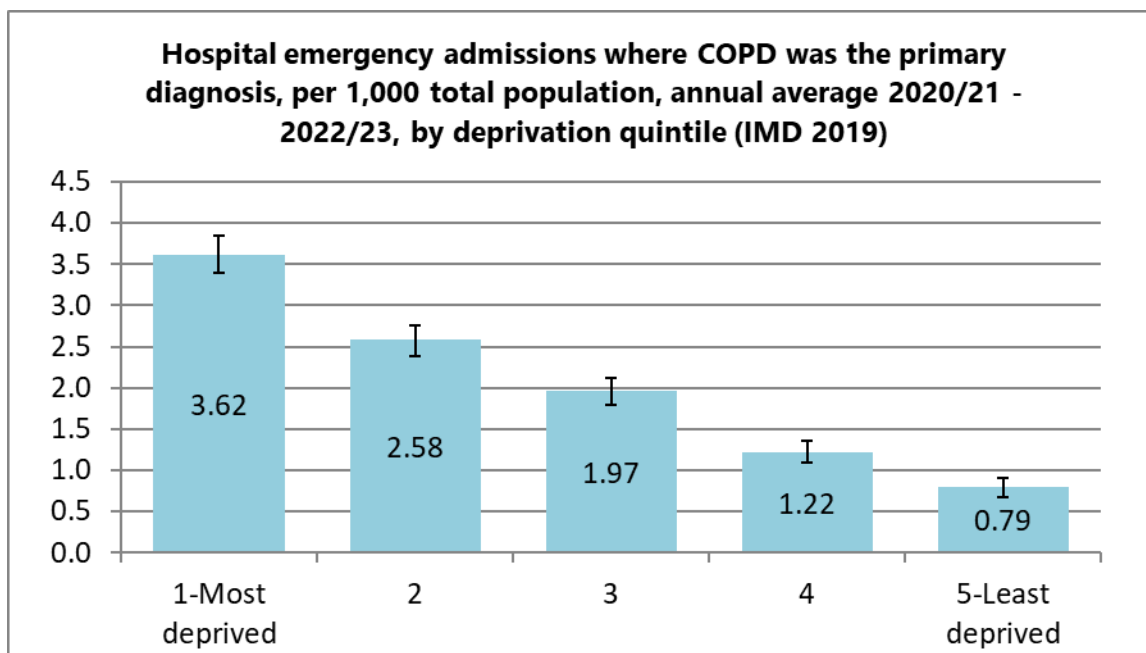


Figure 7: Rate of emergency hospital admission for Chronic Obstructive Pulmonary Disease (COPD), per 1,000 residents (all ages), 2020/21 - 2022/23, by deprivation quintile (IMD 2019). Source: Hospital Episode Statistics (NHS Digital) collated by Public Health, Bristol City Council.

### Asthma

In 2022/23, 32,380 patients (aged 6 or over) at Bristol GP practices were registered on their practice’s asthma register<sup>2</sup>. The percentage of registered patients (6.3%) was significantly lower than the national average (6.5%) for the latest year of QOF data (2022/23). Within Bristol, the percentage is highest in the south of the city (6.9% 2022/23). Higher levels of cigarette smoking in the south of the city historically, may help to explain this variation across the city. The definitions for this indicator, and the patients that are counted for it, were changed in 2019/20 and therefore an analysis of trends over time is limited to the period subsequent to that change.

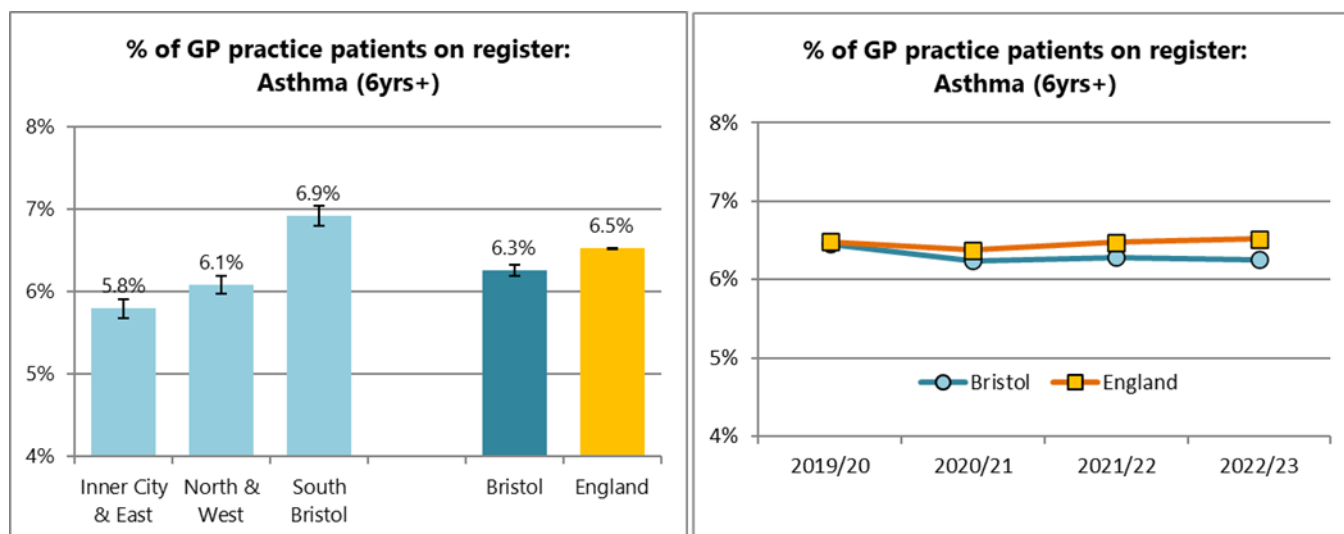


Figure 8: % of GP practice patients on register: Asthma (6 years of age or older). Bristol and Bristol GP localities vs England average 2022/23. Bristol and England average trends 2019/20 to 2022/23. Source: NHS Quality and Outcomes Framework (QOF) 2022/23.



Approximately 1 in 11 of all emergency hospital admissions relating to respiratory illness for Bristol residents, 2020/21 to 2022/23, were caused by asthma<sup>2</sup>. Figure 9 shows that as is the case for COPD, the risk of emergency hospital admission due to asthma (2020/21 to 2022/23) is associated with deprivation, again likely to a large extent to be due to the variation in smoking prevalence and other environmental triggers across the city, e.g., air quality. The rate of emergency admissions due to asthma during 2020/21 to 2022/23 was nearly three times higher for the most deprived 20% of Bristol compared to the least deprived 20%.

Figure 10 presents the variation in asthma emergency admission rates across the city, by ward of residence. There are some similarities between this map and figure four, the map of the contribution of respiratory illness to premature mortality by ward. Rates are highest in some of the more deprived wards and wards where smoking rates are highest, currently and historically. The variation in smoking rates across the city will explain much of this distribution, but air quality is also likely to play its part and will help to explain where there are differences potentially between the maps.

Female Bristol residents are significantly more likely to have an emergency hospital admission due to asthma than male residents. From 2020/21 to 2022/23 they were 81% more likely than men in the city to be admitted to hospital with this diagnosis. As female life expectancy in the city is significantly higher than male life expectancy, this is partly explained by a larger population of elderly female residents at risk of admission due to asthma.

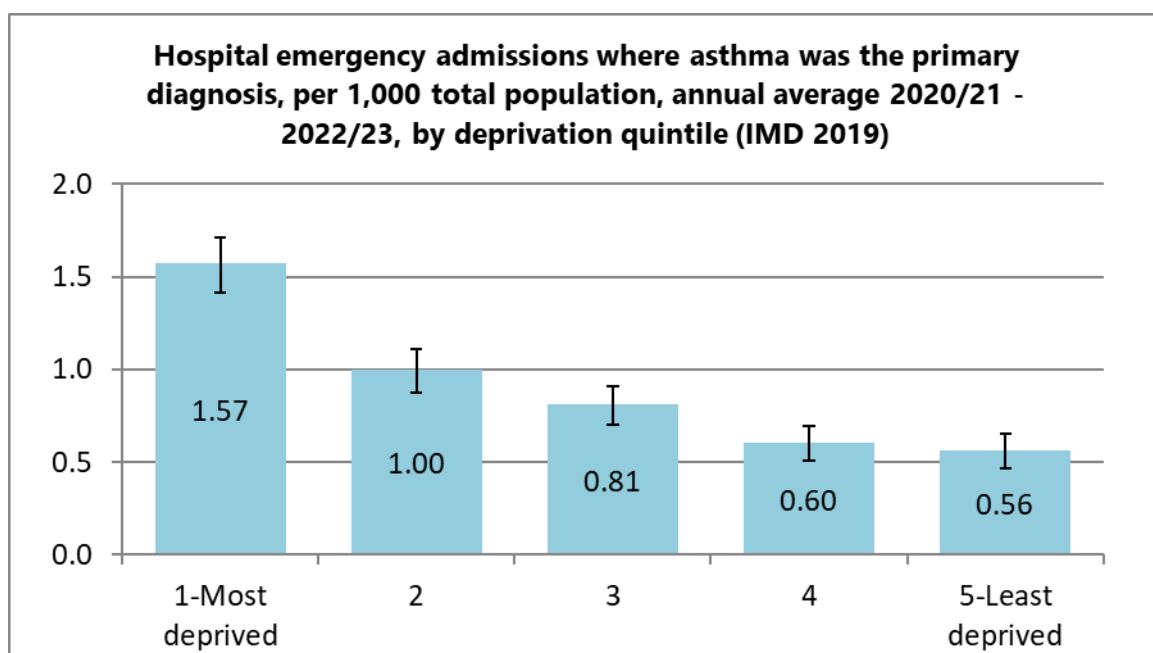


Figure 9: Rate of emergency hospital admission for asthma, per 1,000 residents (all ages), 2020/21 - 2022/23, by deprivation quintile (IMD 2019). Source: Hospital Episode Statistics (NHS Digital) collated by Public Health, Bristol City Council.

<sup>2</sup> Hospital Episode Statistics (NHS Digital) collated by Public Health, Bristol City Council.

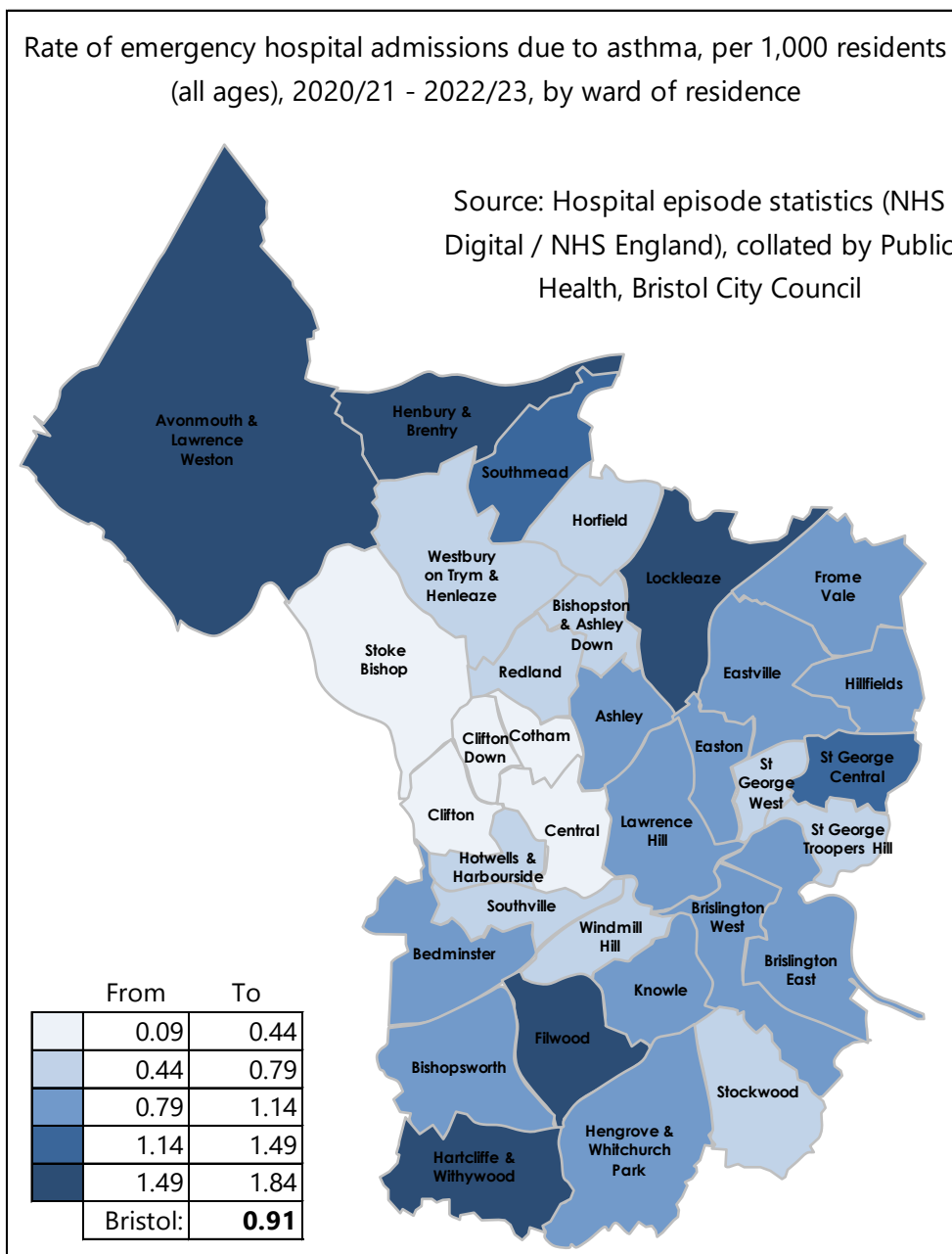


Figure 10: Rate of emergency hospital admission for asthma, per 1,000 residents (all ages), 2020/21 - 2022/23, by ward of residence. Source: Hospital Episode Statistics (NHS Digital/NHS England) collated by Public Health, Bristol City Council.

**Further data / links / consultations:**

- Public Health Outcomes Framework (PHOF) data <https://fingertips.phe.org.uk/>
- Quality and Outcomes Framework (QOF) data, accessed via NHS Digital: <https://qof.digital.nhs.uk/>
- Adult Respiratory Diseases (Chronic Obstructive Pulmonary Disease) in Bristol, North Somerset and South Gloucestershire (BNSSG) 2017. JSNA website <https://www.bristol.gov.uk/policies-plans-strategies/adults-jsna>
- Air Quality – JSNA section: [JSNA Data Profiles \(bristol.gov.uk\)](#)

**Covid-19 impact:** Described throughout the report where relevant.

**Date updated:** November 2023

**Date of next update:** November 2024

Analyst: David Thomas – [David.Thomas@bristol.gov.uk](mailto:David.Thomas@bristol.gov.uk)