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 22 years. There seems to be a long term decline in this risk over the past 22 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 22 years, and at present remains considerably higher for men than women.
- During the period from 2016-2018 including the years most affected by the Covid-19 pandemic (2020-2022) premature mortality from respiratory illness appears to have declined noticeably. This is likely to be related at least in part 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 nearly 10,000 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 2021/22 to 2023/24.
- The latest data indicates that more than 33,500 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 2021/22 to 2023/24, 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 patterns of smoking in the city, the historical legacy of the tobacco industry as well as the varying effects of poor air quality across the city.

Respiratory disease

An average of 106 Bristol residents die prematurely (under 75yrs old) each year from respiratory disease (2015 to 2023). This represents around 9% of all premature deaths in the city during this period.

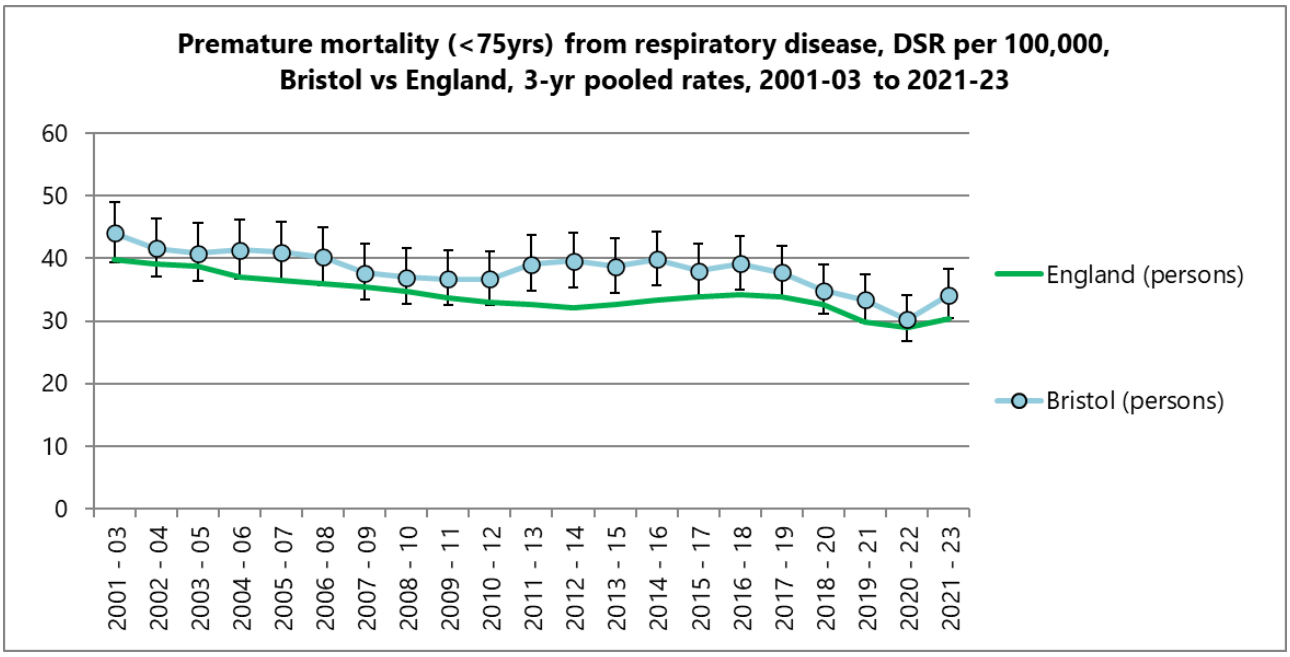

Figure 1: Premature mortality (<75yrs) from respiratory disease, DSR per 100,000, Bristol vs England, 3-year pooled rates, 2001-03 to 2021-23. Source: Office for Health Improvement & Disparities Fingertips tool.

Over the last 22 years the rates of premature mortality due to respiratory illness in Bristol have fallen overall from 44.1 per 100,000 in 2001 to 2003, to 34.2 per 100,000 in 2021 to 2023, but the decline has been anything but steady and consistent during that time. For most of this period the rate has been close to or above 40 per 100,000, with a period of slightly lower rates 2007-2009 to 2010-2012, and a steady decline from 2016-2018 to 2020-2022 (coinciding with the Covid-19 pandemic) before a slight rebound during the most recent 3-year period (2021-2023). During the entire period the premature mortality rate due to respiratory illness in Bristol has been higher than the national average, but to a statistically significant extent only during the period 2011-2013 to 2014-2016 and in 2016-2018.

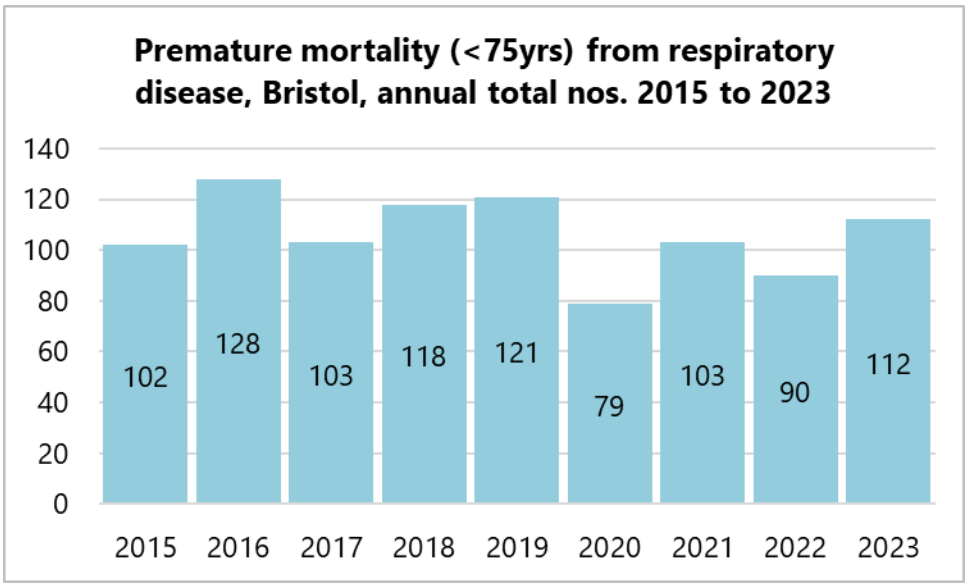

Figure 2: Premature mortality (<75yrs) from respiratory disease, Bristol residents, annual total numbers. Source: Primary Care Mortality Dataset (PCMD), NHS England – Data collated by Public Health, Bristol City Council

The Covid-19 pandemic appears to have some impact on mortality rates from respiratory illness in Bristol between 2020 and 2022. 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 the vast majority of 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.

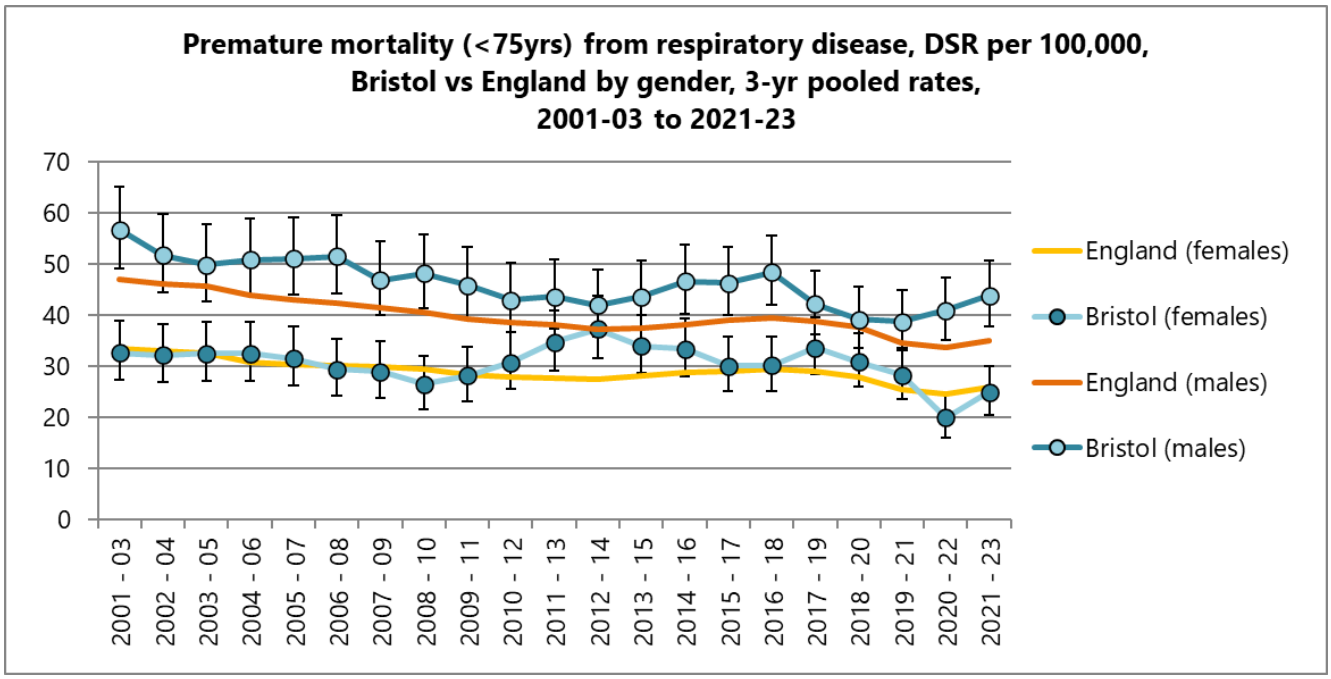

Figure 3: Premature mortality (<75yrs) from respiratory disease, DSR per 100,000, Bristol vs England, annual rates, 2001-03 to 2021-23. Source: Office for Health Improvement & Disparities Fingertips tool.
*DSR – Directly Standardised Rate

Gender: In Bristol and nationally, men are at more risk of premature death from respiratory disease, but that gap mainly narrowed overall during the last 20 years, although widening again in Bristol since 2019-2021 and the Covid-19 pandemic. There have been notable fluctuations over the 22 year period presented in figure 3 above, but over the entire period the premature mortality rates for men in Bristol appear to have declined more significantly than they have for women in the city, hence the apparent closing of the gap between men and women's rates for much of this time.

After many years of decline to 2012-2014, both the national and Bristol premature mortality rates for men from respiratory illness started to rise again for around 4 years to 2016-2018. There followed three years of decline to 2019-2021 but since then the premature mortality rate for men seems to have risen once more, with the Bristol male premature mortality rate significantly higher than the national male average for 2020-2022 and 2021-2023.

The premature mortality rates for females from respiratory illness in Bristol and nationally declined (as did the rate for males) from 2001-2003 to 2008-2010, but for a lengthy subsequent period to 2017-2019 (effectively until the onset of the Covid-19 pandemic) the trends in female premature mortality from respiratory illness in Bristol were almost a mirror image of those for males; rising to almost match the male rate in 2012-2014, but then mainly declining since then and especially so with the onset of the Covid-19 pandemic, with a rebound during the most recent period 2021-2023. For all but a period around 10-years ago (2011 to 2015) the premature mortality rate for females in Bristol was statistically similar to the national average, and the latest value is very close to the national average.

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 five on the following page 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 2019 to 2023, 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%.

An analysis of emergency hospital admissions related to respiratory illness in Bristol in 2021/22 to 2023/24 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 four below shows that the risk of admission for respiratory illness during that period appears to be closely 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.

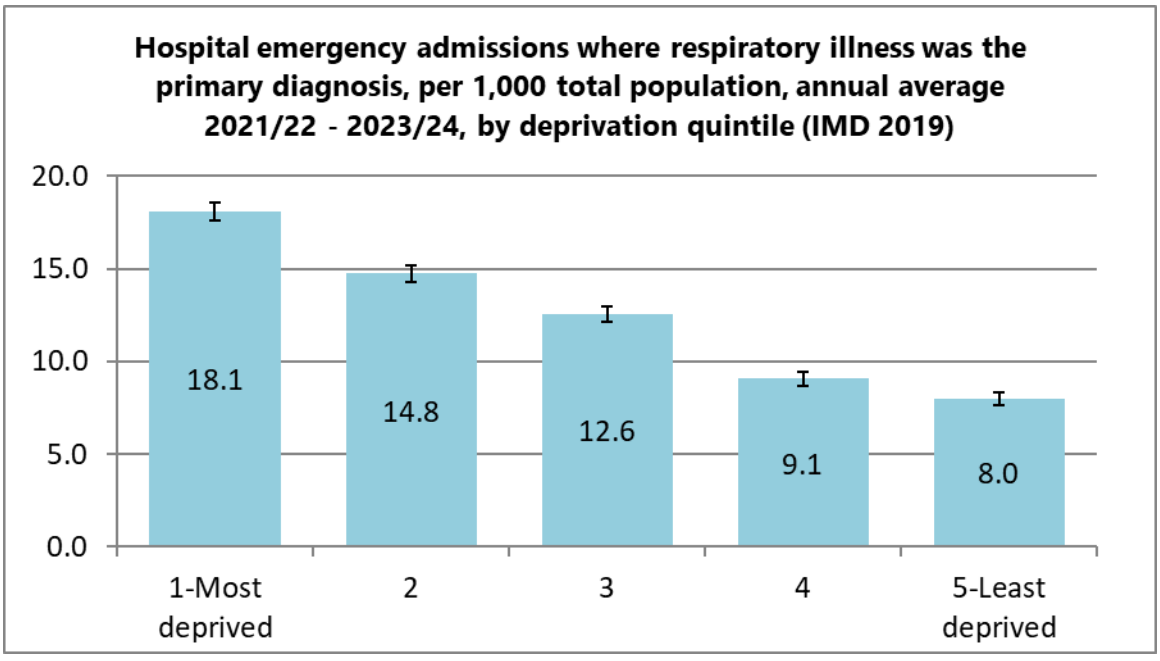

Figure 4: Rate of emergency hospital admission for respiratory illness, per 1,000 residents (all ages), 2021/22 – 2023/24, by deprivation quintile (IMD 2019). Source: Hospital Episode Statistics (NHS Digital) collated by Public Health, Bristol City Council.

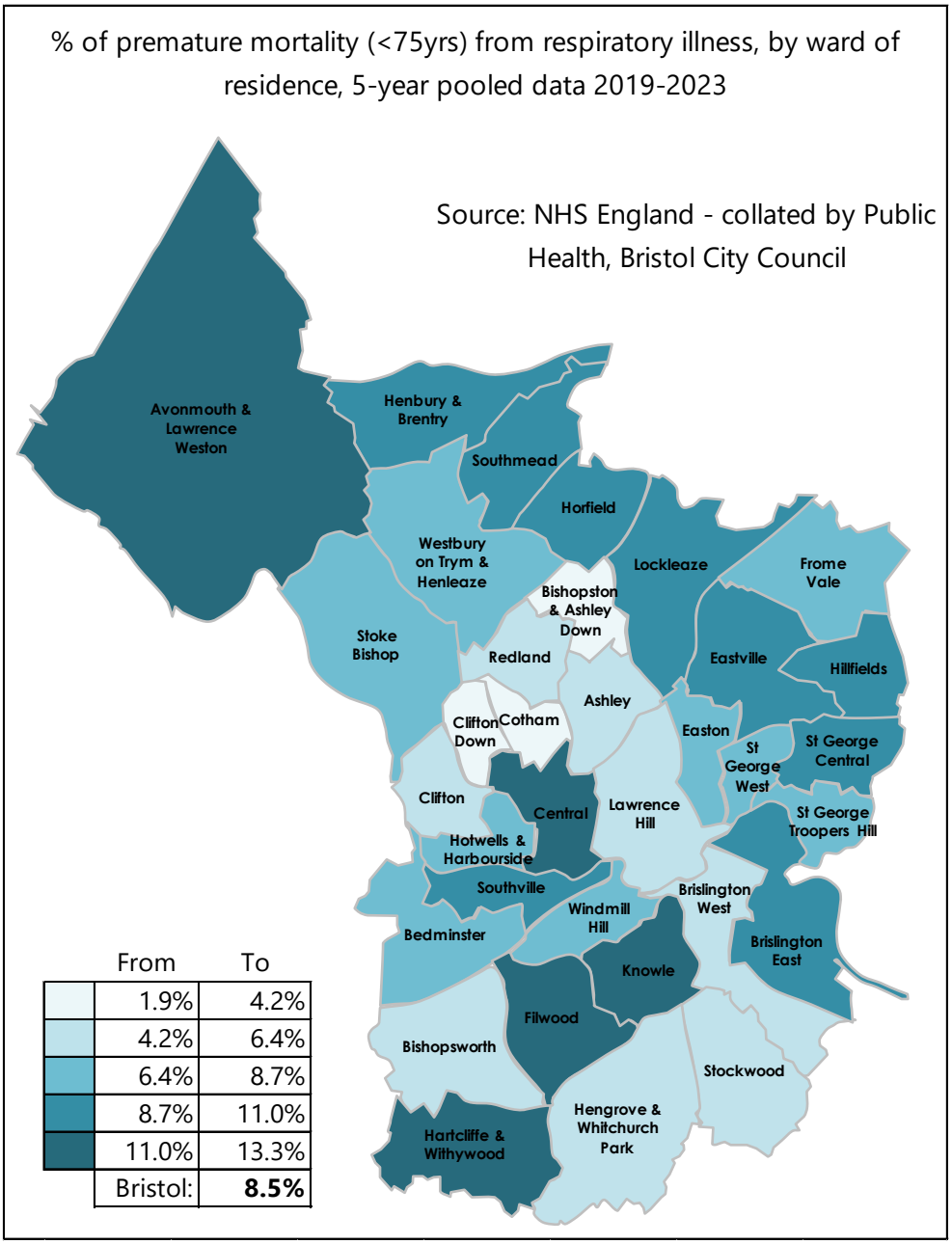

Figure 5: % of Premature mortality (<75yrs) from respiratory disease, by ward of residence, 5-yr pooled data, 2019-2023. Source: Primary Care Mortality Dataset (PCMD), NHS England – Data collated by Public Health, Bristol City Council

Chronic obstructive pulmonary disease (COPD)

During 2015 to 2023, 55% 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 2023/24, 9,973 patients at Bristol GP practices were registered on their practice's COPD register[1]. The percentage of registered patients (1.8%) was significantly lower than the national average (1.9%) for the latest year of QOF data (2023/24). Within Bristol, the percentage is highest in the south of the city (2.4% 2023/24). Higher levels of cigarette smoking and the

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

legacy of the tobacco industry in the south of the city historically, may contribute to this variation across the city.

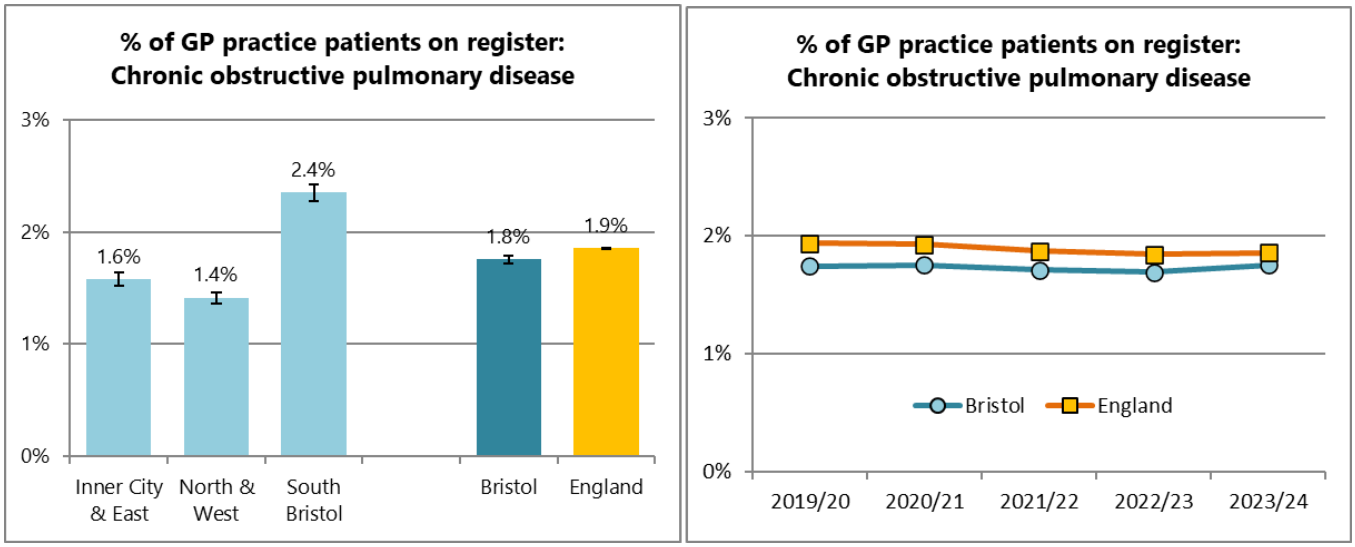

Figure 6: % of GP practice patients on register: COPD. Bristol and Bristol GP localities vs England average 2023/24. Bristol and England average trends 2019/20 to 2023/24. Source: NHS Quality and Outcomes Framework (QOF) 2022/23.

As was previously noted, COPD is a significant contributor to overall respiratory illness in the city; 20%, or around 1 in 5 emergency admissions for Bristol residents during 2021/22 to 2023/24 for respiratory illness were due to COPD in particular.

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 and Brislington East. In the most deprived 20% of Bristol, the contribution of COPD admissions was more than twice that seen in the least deprived 20% (24% vs 11%). The rate of emergency admissions due to COPD was also very strongly associated with deprivation. During 2021/22 to 2023/24 it was more than four times higher in the most deprived 20% of Bristol than the least deprived 20%.

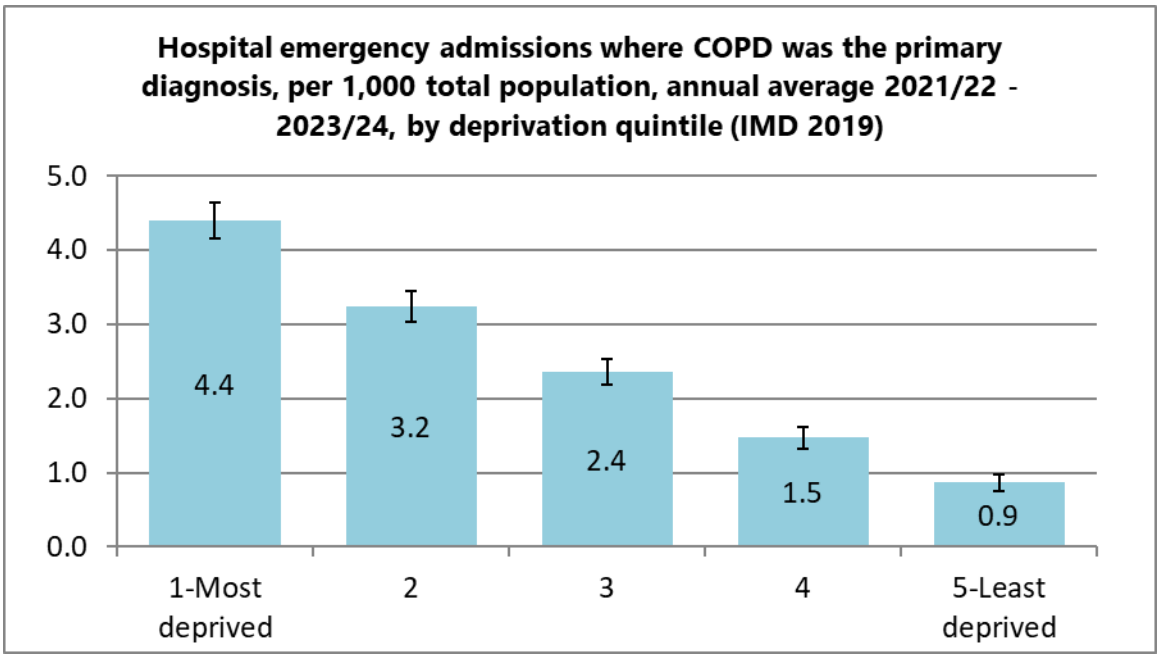

Figure 7: Rate of emergency hospital admission for Chronic Obstructive Pulmonary Disease (COPD), per 1,000 residents (all ages), 2021/22 - 2023/24, by deprivation quintile (IMD 2019). Source: Hospital Episode Statistics (NHS Digital) collated by Public Health, Bristol City Council.

Asthma

In 2023/24, 33,512 patients (aged 6 or over) at Bristol GP practices were registered on their practice's asthma register[2]. The percentage of registered patients (6.2%) was significantly lower than the national average (6.5%) for the latest year of QOF data (2023/24). Within Bristol, the percentage is highest in the south of the city (6.9% 2023/24). Higher levels of cigarette smoking in the south of the city historically, may help to explain this variation across the city.

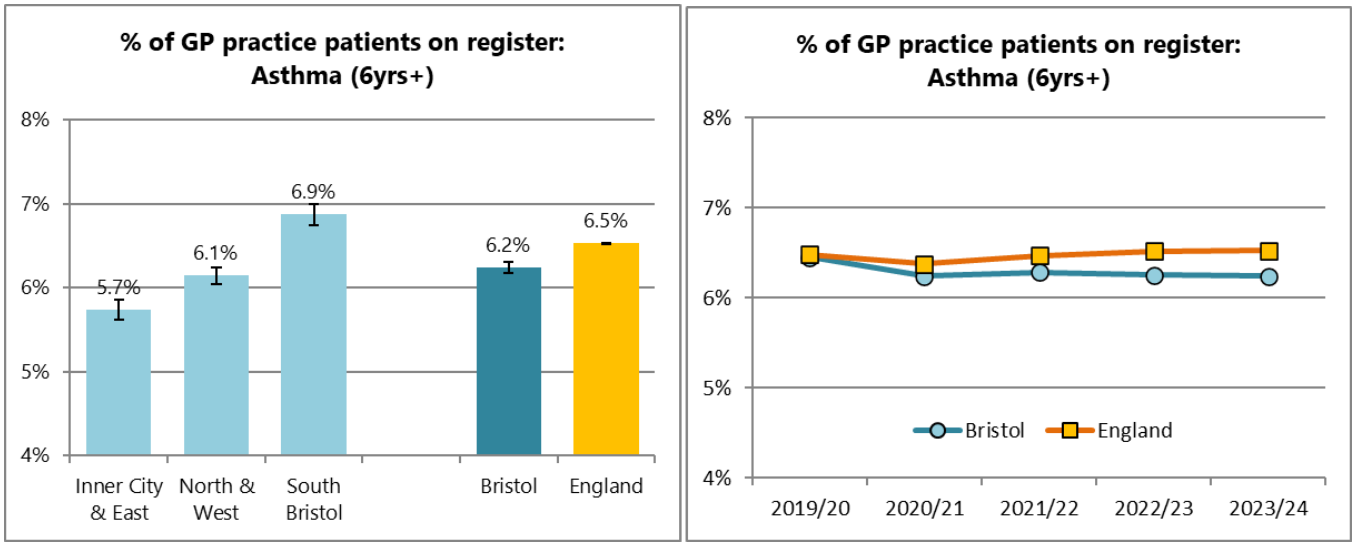

Figure 8: % of GP practice patients on register: Asthma (6 years of age or older). Bristol and Bristol GP localities vs England average 2023/24. Bristol and England average trends 2019/20 to 2023/24. Source: NHS Quality and Outcomes Framework (QOF) 2023/24.

Approximately 1 in 11 of all emergency hospital admissions relating to respiratory illness for Bristol residents, 2021/22 to 2023/24, were caused by asthma[2]. Figure 9 shows that as is the case for COPD, the risk of emergency hospital admission due to asthma (2021/22 to 2023/24) 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 2021/22 to 2023/24 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 five, 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 2021/22 to 2023/24 they were 70% 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.

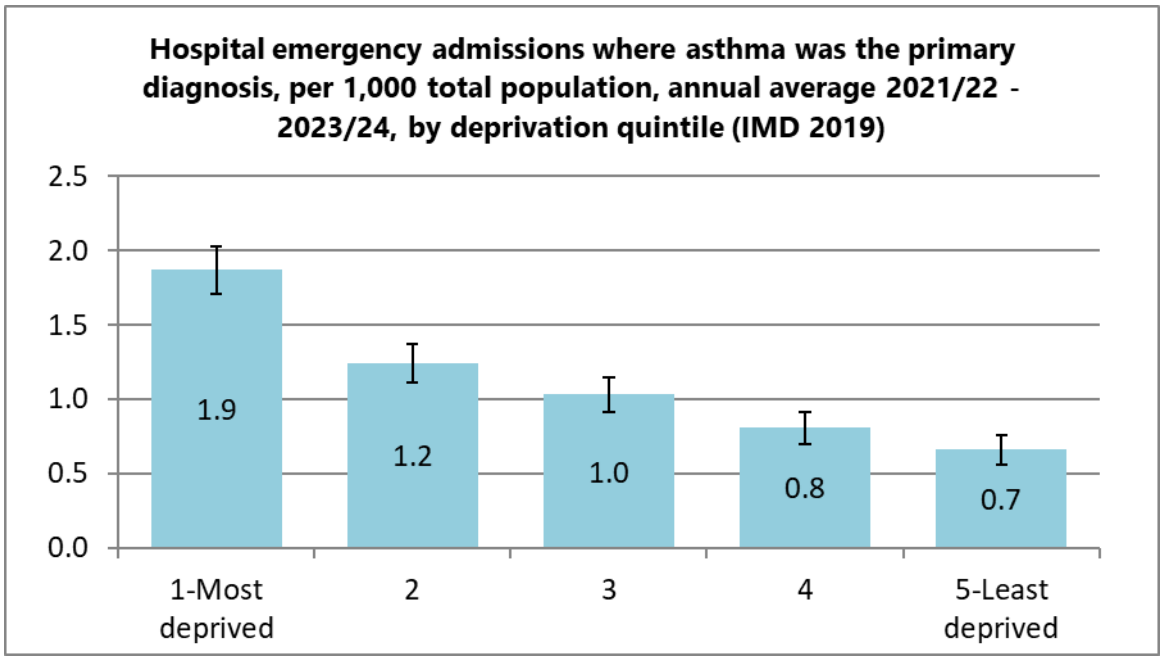

Figure 9: Rate of emergency hospital admission for asthma, per 1,000 residents (all ages), 2021/22 - 2023/24, by deprivation quintile (IMD 2019). Source: Hospital Episode Statistics (NHS Digital) collated by Public Health, Bristol City Council.

[2] Hospital Episode Statistics (NHS Digital) collated by Public Health, Bristol City Council.

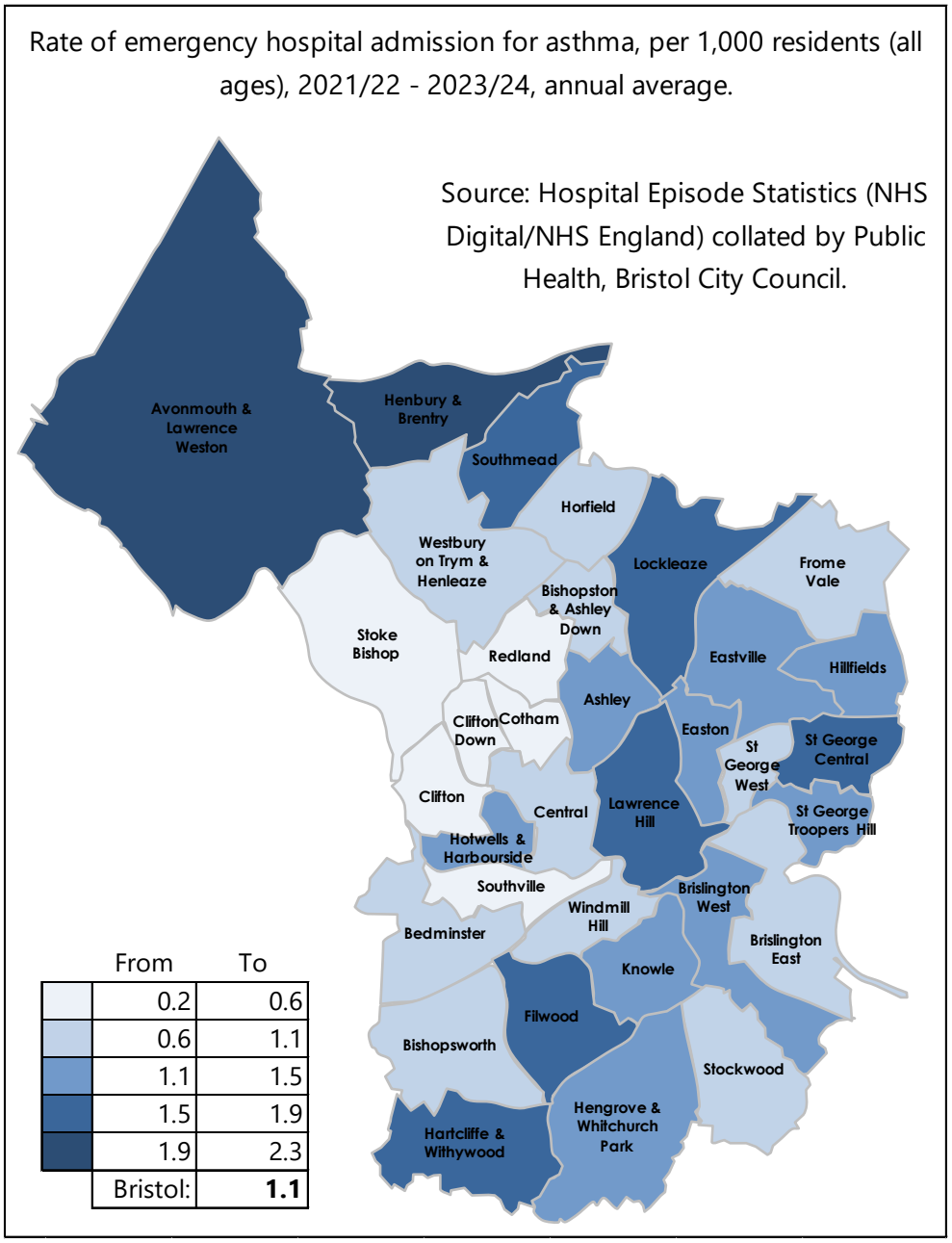

Figure 10: Rate of emergency hospital admission for asthma, per 1,000 residents (all ages), 2021/22 - 2023/24, by ward of residence. Source: Hospital Episode Statistics (NHS Digital/NHS England) collated by Public Health, Bristol City Council.

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.

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