COVID-19

Summary points

- Since the peak years of the pandemic have passed and following significant changes to COVID-19 testing the government has withdrawn some of the previously available routine data sources that we have made use of to assess the level and nature of the threat to Bristol. It is difficult to assess the full impact of the virus during 2023/24. It is not possible to compare reported confirmed case rates with those prior to the changes or compare against other cities.
- The cumulative case rate[1] of COVID-19 per 100,000 people in Bristol was 39,892, higher than the England rate of 36,864 (March 2020 – 31st March 2023)
- The age-standardised mortality rate for COVID-19 was 279.3 per 100,000 people in Bristol (March 2020 – January 2023), lower than the England average (340.1) and lower than the other English core cities.
- Reported case rates were higher for females than males in Bristol (March 2020 - April 2024), although death rates were significantly higher for males (2020-2022).
- The risk of hospitalisation increased with age, with over 75% of patient beds occupied by residents aged 50 and over.
- Deprivation and ethnicity were also risk factors associated with higher hospitalisation and mortality rates - people living in the 40% most deprived areas had a mortality rate almost double that of people living in the 40% least deprived areas.
- There is a large variation in vaccination uptake associated with ethnicity in Bristol, average uptake tends to be lowest for residents of Black & Black British ethnicity, 'white other' ethnicity (incl. eastern Europeans) and residents of some mixed heritage backgrounds.

Background

SARS-CoV-2 (often referred to as Coronavirus or COVID-19) is an infectious disease caused by a coronavirus. COVID-19 was first reported in December 2019 in China, and then rapidly spread around the world. The UK saw its first cases by the end of January 2020. Between March 2020 and the end of March 2024 there had been a total of 21,091,080 reported cases of COVID-19 in England, and the deaths of almost 202,000 people were recorded as 'involving' COVID-19 (noted on their death certificate), with approximately 12,000 of those deaths registered during the year to March 2024.

Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and will recover without requiring healthcare services. Older people, pregnant people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.

Bristol Picture

Bristol's first reported case was on 3rd March 2020. The first reported death with Covid in Bristol was on 27th March 2020. Since the beginning of the pandemic to date (September 2024) there have been approximately 190,000 reported confirmed cases of Covid for Bristol

[1] Case rate – this counts the number of incidents of Covid-19 not individuals, some individuals may have had Covid-19 more than once.

residents. Figure 1 below illustrates the trend in cases over time. It is important to bear in mind the changes in the COVID-19 testing regime and access to free testing during the pandemic when interpreting this chart, which is explained below.

The first wave lasted from March 2020 to May 2020 in Bristol. At the time testing was limited to patients and hospital staff, community testing was unavailable to most people, so reported number of cases will have been artificially low. During this first wave 1,179 people tested positive for COVID-19, 1,248 people were admitted to hospital with COVID, and 229 people died. On 23rd March 2020 the first national lockdown started, cases in Bristol peaked on 24th April 2020 and lockdown restrictions started to be eased in early June.

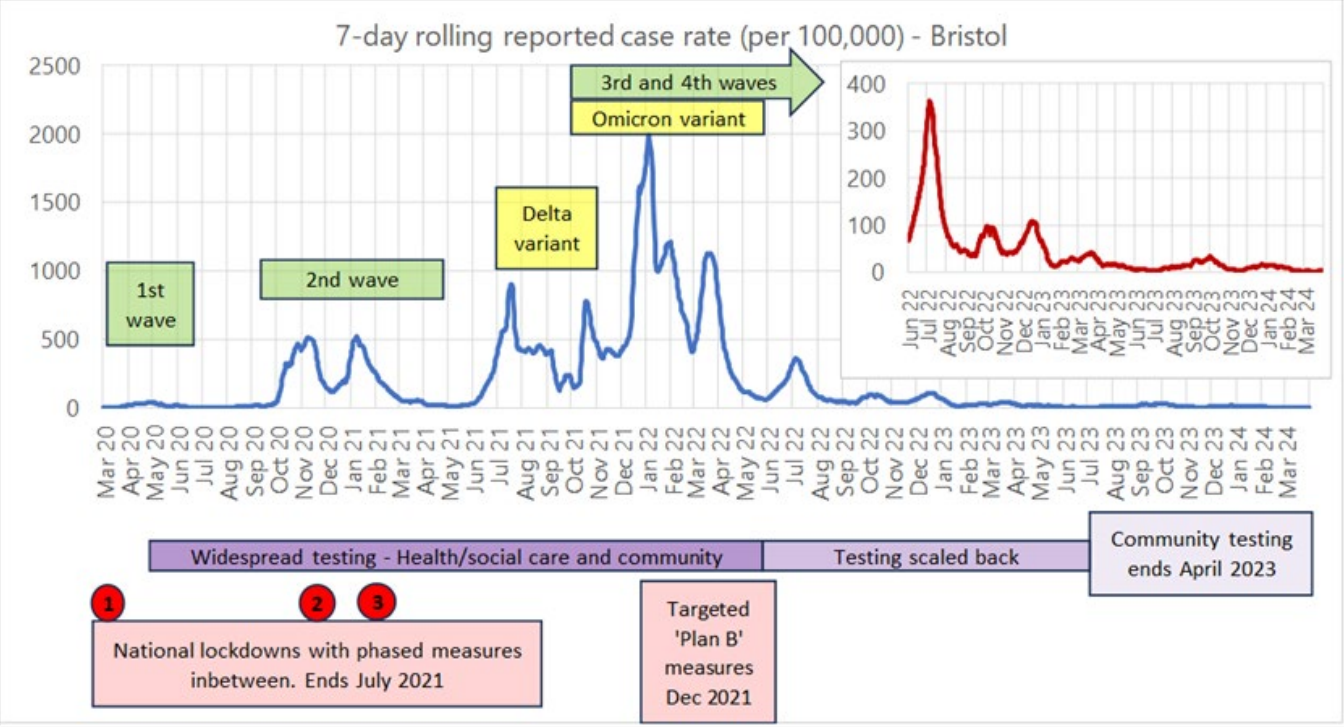

Fig 1: Trend in new covid cases. Source: UKHSA

Testing was expanded to wider community testing from May 2020. Testing capacity increased throughout the summer and autumn (see figure 2 overleaf) and peaked over the Christmas period of 2021.

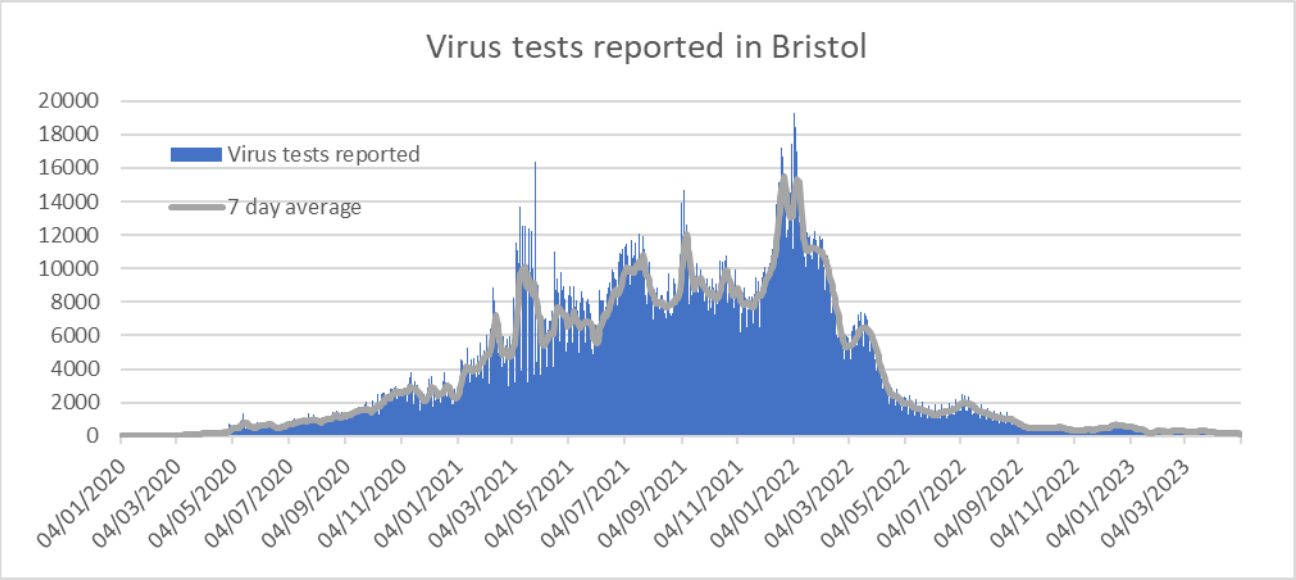

Fig 2 Virus tests reported in Bristol. Source: UKHSA

With effect from 1st April 2022 onwards, free community testing for COVID-19 in England was discontinued for the vast majority of the population (except for certain vulnerable groups and health and care providers) and from that time onwards the numbers of people testing and/or reporting their result to the NHS diminished considerably. This change in testing coverage means that it is not possible to compare case-derived statistics post-April 2022 with those prior to that change. Beyond that date it ceased to be a reliable guide to the prevalence of infection as the access to and uptake of testing had very low population coverage and this varied widely across the population.

Between 1st January 2020 and 31st March 2023, 4,435,640 virus tests were reported, consisting of 1,862,411 PCR tests and 2,573,229 LFD tests. Cases remained low over the summer of 2020 but rose rapidly in late September 2020, originally mostly in young people aged 18 to 23 but rapidly spreading to all age groups. New case rates continued to rise into November, peaking in early November at almost twice the national rate (fig 1).

The country was put into a second national lockdown on 5th November 2020 (although schools remained open) which ended on the 2nd of December, and case rates in Bristol reduced.

Following the third national lockdown in early January 2021 cases fell in Bristol to a very low level by May 2021 but like the rest of the country rose again between June and August 2021, and remained very high throughout the summer. Rates fell rapidly in early September but experienced a spike in cases in October 2021 mainly associated with school age children.

New case rates peaked at 2,022 per 100,000 on 4th January 2022 (this equates to 9,402 new cases in 7 days) and is the highest rate to date for Bristol since the pandemic started. The rate had halved by the 6th of February (1,020 per 100,00) and stood at 846 per 100,000 on the 31st March 2022.

From the 1st of April 2022 when all covid restrictions were lifted, and free COVID-19 testing was targeted at health and social care workers and the most vulnerable only, the reported case statistics provide some indication of the presence of new waves of infection, but not their size in relation to those pre-April 2022.

Cases

Overall, between March 2020 and September 2024 there have been approximately 190,000 reported positive cases of COVID-19 in Bristol. Analysis of reported cases between March 2020 and April 2024 shows there was a higher rate of cases reported for female residents than male overall and is most obvious for residents aged between 10 and 59 years of age (Fig 3). This may be due to individual testing decision and focus, with women possibly accepting the testing regime more than men.

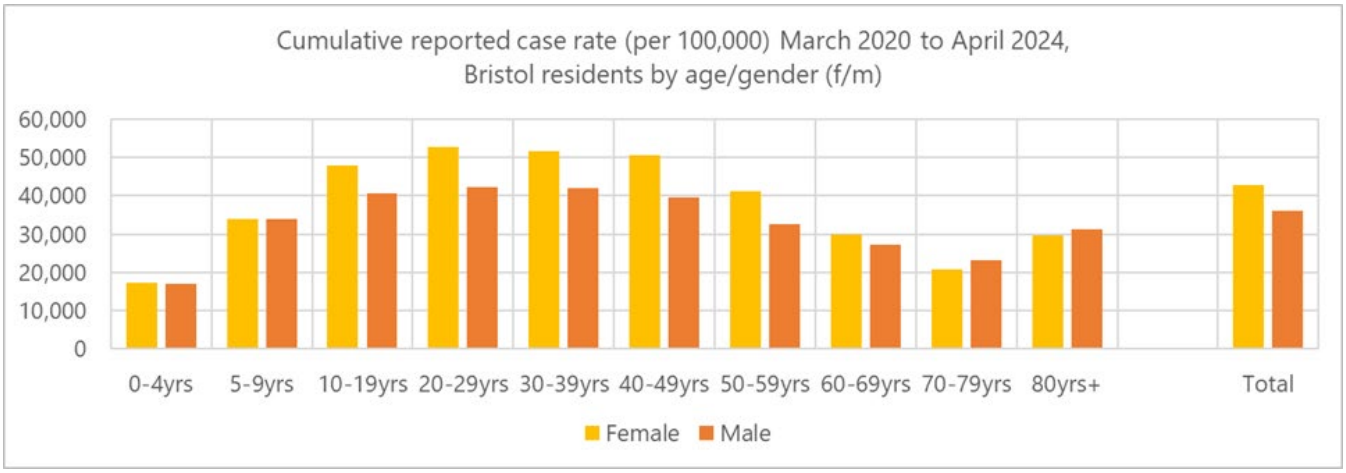

Figure 3 Total number of COVID-19 cases within Bristol by age group and sex, March 2020 to April 2024. Source: UKHSA

Prior to April 2022, when reported cases were a more reliable guide to infection prevalence 54% of the cases were related to female residents, and 46% related to male residents. Female cases were considerably greater amongst residents aged between 15 and 59 as shown in figure 4 below. During this period 47% of cases were reported for residents aged under 30 years of age, 44% related to residents aged between 30 and 59 years of age and just 9% related to residents 60 years of age or older.

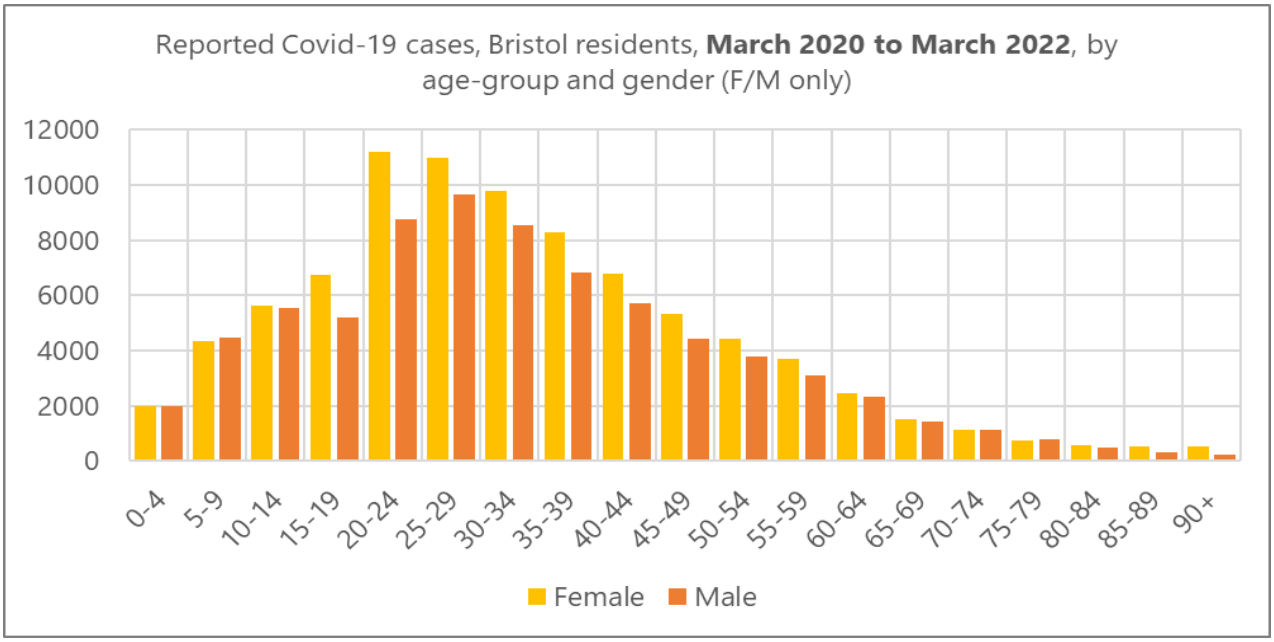

Figure 4 Total number of COVID-19 cases within Bristol by age group and sex, March 2020 to March 2022. Source: UKHSA

After the reduction in testing post April 2022, eligibility for free NHS testing was much more skewed towards older residents and those working in health and social care, with a considerable impact on the demographics of those with a reported positive test result. During this later period 60% of all reported cases related to female residents and 40% related to male residents. 23% of cases were reported for residents aged less than 30 years of age, 51% for those aged between 30 and 59 years of age and 25% related to residents aged 60 years of age or older.

Ethnicity was recorded for just three-quarters of reported cases, and the variation already seen by age will influence the variation presented in Figure 5 below, but there is a wide variation in the cumulative case rate during the pandemic. The ability and propensity to test for Covid-19 will explain some of this variation.

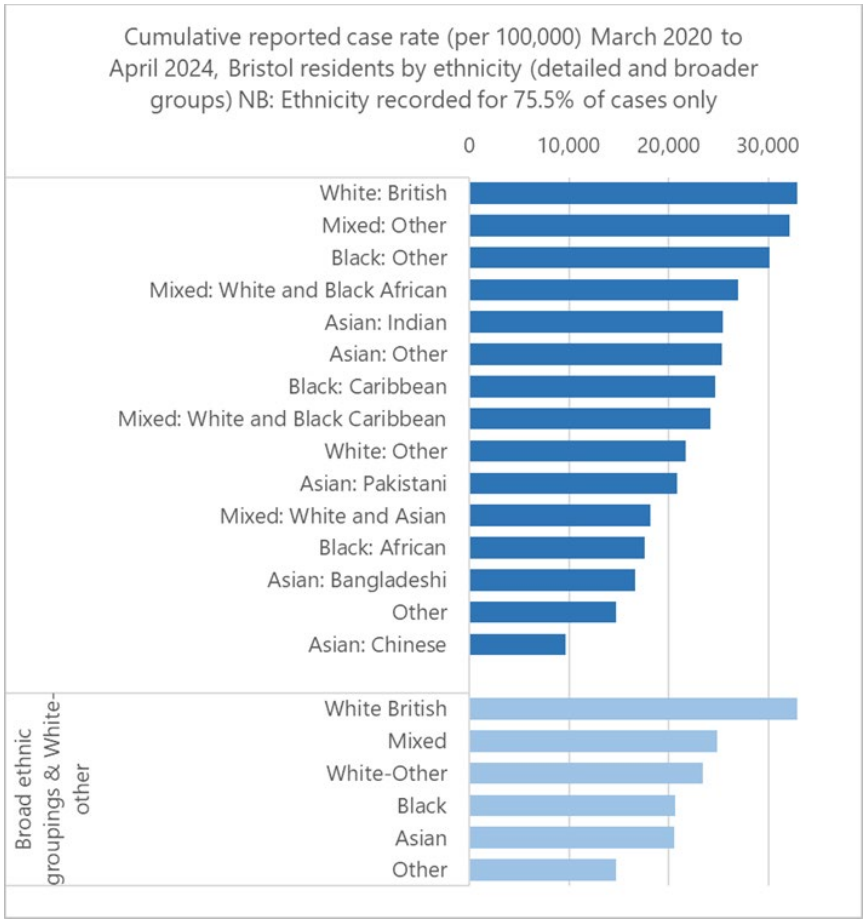

Figure 5: Cumulative reported case rate per 100,000 population in Bristol, March 2020 to April 2024 by ethnicity

Hospitalisations

17,672 people with COVID-19 were admitted to the two main hospital trusts that serve Bristol (not necessarily just Bristol residents) between March 2020 and 31st March 2024. Figure 6 overleaf shows that admission numbers were largely responsive to successive waves of infection throughout the pandemic since March 2020, but the pressure on the local NHS has remained throughout the period.

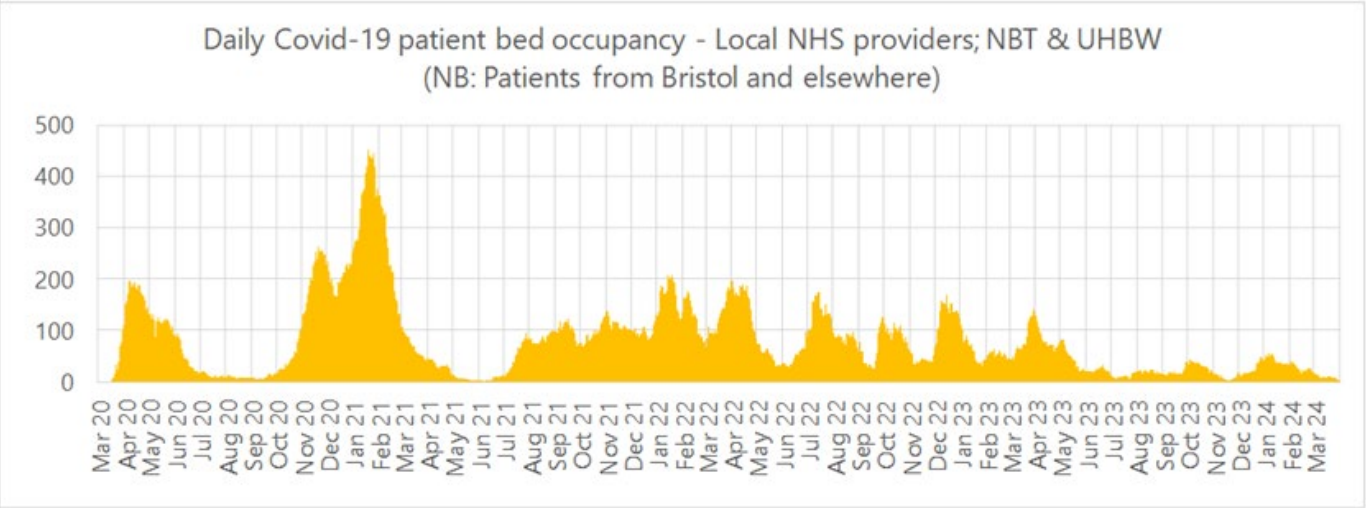

Figure 6 Daily total bed-occupancy by patients with Covid-19. Source: Public Health, Bristol City Council

The annual total admissions of patients with Covid-19 for April 2020 to March 2021, April 2021 to March 2022 and April 2022 to March 2023, were very similar at between 5,000 and 6,000 per year, but this decreased significantly during 2023/24 to approximately 1,750 patients. Not all patients were admitted to hospital for the treatment of COVID-19, a proportion were admitted for other clinical reason with COVID-19 an incidental finding due to testing.

Analysis of the 12-month dataset from July 2021 to June 2022 showed that 75% of the Covid-19 patient bed occupancy related to Bristol residents aged 50 and over but who make up less than 30% of the population of the city (Figure 7). This association with age does not vary greatly with gender, but overall there is a slight skew towards male residents with men representing 52% of the Covid-19 patient bed occupancy during this period. This contrasts with the female skew previously shown for the reported cases of Covid-19.

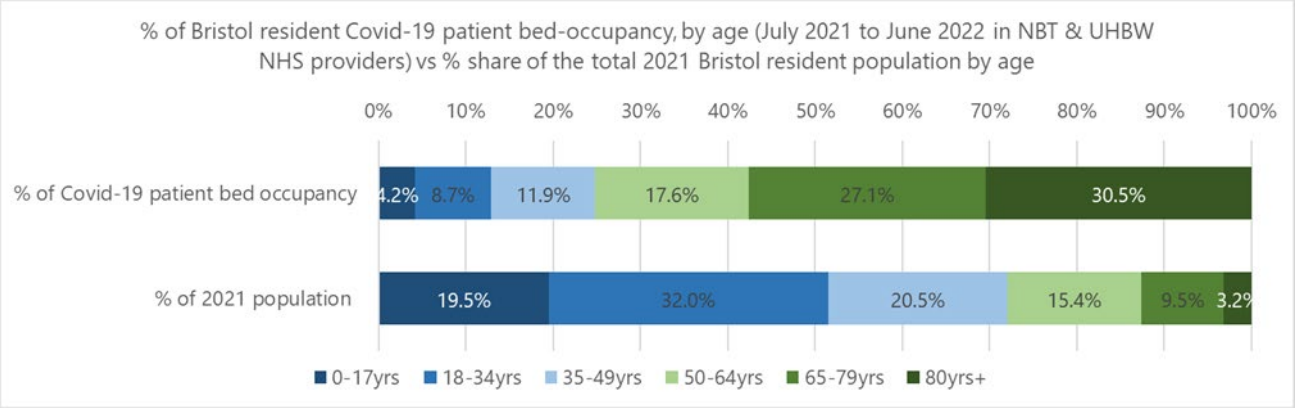

Figure 7: % of Bristol resident Covid-19 patient bed occupancy by age group (July 2021 to June 2022) v % share of the total 2021 Bristol resident population by age

Comparison of the ethnicity of Covid-19 patient bed occupancy with the ethnic proportion of Bristol's total population provides a crude indication of whether there is an over or under representation. Figure 8 below suggests that residents of Black or Black British ethnicity may have been at an elevated risk of hospitalisation. Again, this seems to contrast with lower reported Covid-19 case rates. This ethnic group were also on average the least likely to be vaccinated against Covid-19 and this may have contributed to an increased risk of morbidity and hospitalisation resulting from infection.

Ethnicity (aggregated ethnic groups)	% of Covid-19 bed occupancy (a)	% of 2021 population (b)	Ratio (a/b)
Black	7.1%	5.9%	1.21
White	85.5%	81.1%	1.05
Other	1.9%	1.9%	1.00
Asian	4.3%	6.6%	0.65
Mixed	1.2%	4.5%	0.26

Figure 8: % of Bristol resident Covid-19 patient bed-occupancy, by broad ethnic grouping (July 2021 to June 2022 in NBT & UHBW NHS providers) vs % share of the total 2021 Bristol resident population

Using the same dataset as above it was possible to determine that people living in the 20% most deprived areas of Bristol accounted for 29.3% of bed occupancy, compared to just 12.2% bed occupancy of people living in the 20% least deprived areas.

This social gradient may be due to a number of potential factors that lead to an increased risk of ill health and hospitalisation from COVID-19 infection for more deprived communities on average; poorer underlying health, the greater presence of known risk factors for COVID-19 morbidity (smoking and obesity), the greater exposure to infection risk through manual / frontline occupations (unable to work from home), higher density households as a factor in increasing the risk of infection, as well as lower vaccination uptake in some deprived communities.

Mortality

There are two main methods of measuring COVID-19 mortality:

(1) deaths within 28 days of a positive COVID-19 test. This method, used by Public Health England / United Kingdom Health Security Agency (PHE / UKHSA), has the benefit of being very up to date – it is reported daily, however, the downside is that the death of the individual may not have been related to COVID-19 infection.
(2) The second method, used in this document and used by Office for National Statistics, counts deaths due to covid as mentioned on the death certificate as the underlying cause of death.

This document uses the Office for National Statistics definition of COVID-19 mortality based upon the cause of death at death registration.

Between March 2020 and 29th December 2023 a total of 948 Bristol residents died of COVID-19. Figure 9 overleaf shows how the numbers of these deaths have been distributed over the course of the pandemic. Unlike the numbers of COVID-19 patients described in the previous section, which have remained relatively consistent year to year since March 2020, COVID-19 mortality has diminished considerably over time. From March 2020 to March 2021, 613 Bristol residents died with COVID-19, approximately 15% of all mortality in Bristol during this time. From April 2021 to March 2022 the number of deaths was 193, approximately 6% of all mortality during this time.

There were 115 deaths due to COVID-19 in the period April 2022 to March 2023 (approximately 3% of mortality during this period) which reduced further to 27 deaths in the nine months from April 2023 to December 2023. From January 2024 the number of deaths due to COVID-19 was deemed low (fewer than influenza or pneumonia) and detailed breakdown was no longer included in the national dataset.

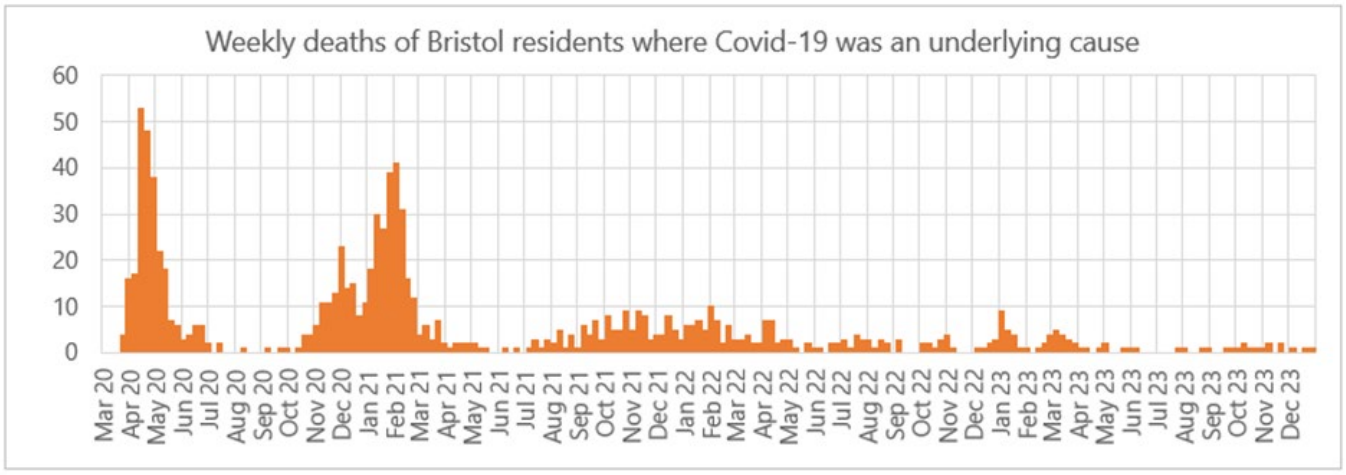

Figure 9 Trend in number of COVID-19 deaths. Source: Office for National Statistics.

Due to Bristol's much younger age profile compared to other areas (and England overall) comparing crude mortality rates can be misleading – we would expect to see fewer COVID-19 deaths in Bristol as COVID-19 serious illness affects older people much more than younger people. Comparing age-standardised mortality rates (i.e. removing the effect of the population age structure) shows that whilst Bristol had a significantly lower COVID-19 mortality rate than the majority of local authorities in England (and England overall) it was significantly higher than the South West regional average (figure 10). However this does not take into account wider socio-economic demographics which are very different for Bristol compared to other South West local authorities.

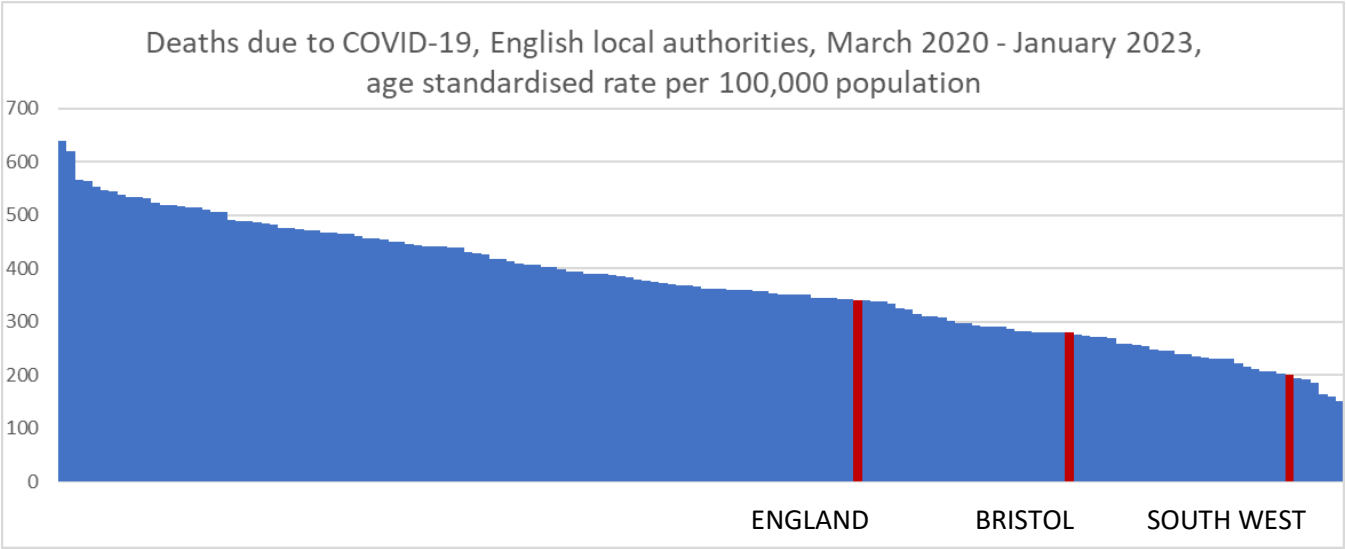

Figure 10 Age standardised COVID-19 mortality rates, English local authorities. Source: Office for National Statistics via CHIME tool

Bristol's age-standardised COVID-19 mortality rate is significantly lower than the England average and all the other English core cities (figure 11). It is also significantly lower than most of the local authorities in the CIPFA nearest neighbours comparator group, with the exception of Swindon and Plymouth.

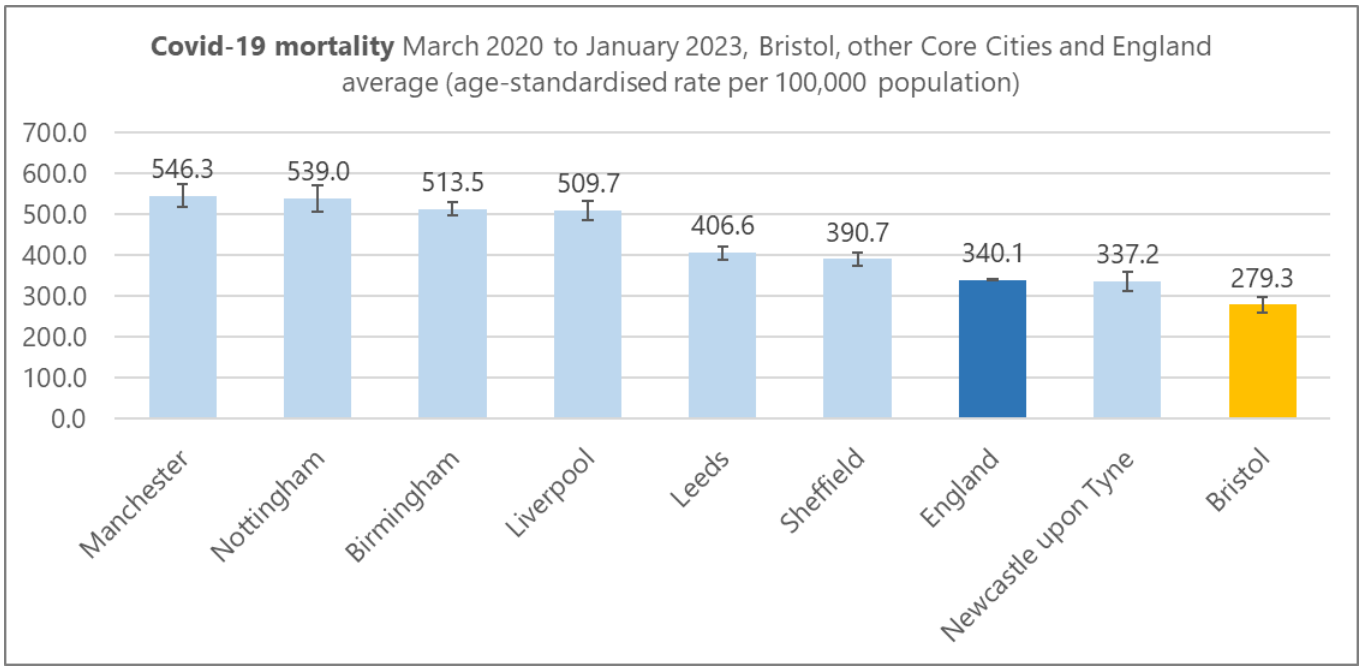

Figure 11 Age standardised COVID-19 death rate, English Core Cities. Source: Office for National Statistics via CHIME tool

Analysis of Bristol mortality data (2020-2022) by age group showed that deaths involving COVID-19 were significantly higher for residents aged 85 and over than any other age group, per 100,000 (Figure 12)

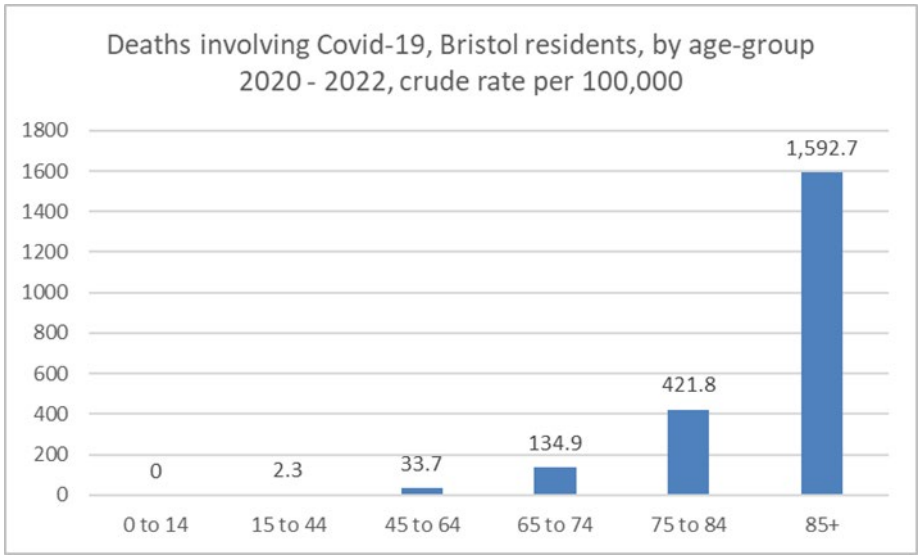

Figure 12: Deaths of Bristol residents involving COVID-19 by age group (2020-2022)

In addition to hospitalisation, deprivation is also associated with the increased risk of mortality with COVID-19 in Bristol. Adjusted for differences in age-demographics, the risk of death with COVID-19 (2020 to 2022) in Bristol in the most deprived 40% of the city was around double that in the most affluent 40% of the city (Figure 13).

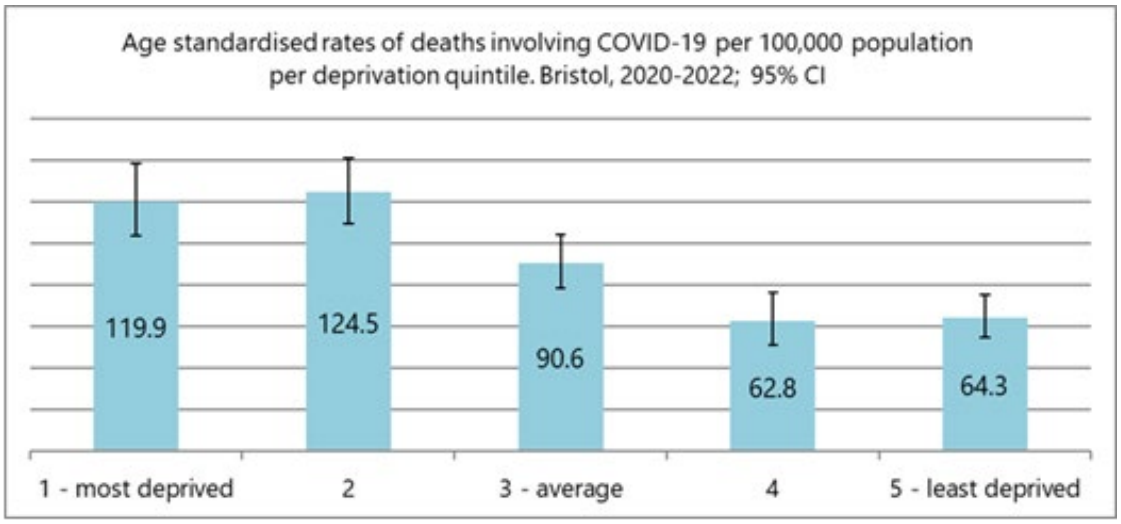

Figure 13: Mortality rate for deaths due to COVID-19 by deprivation quintile, all ages, 2020-2022, Bristol.

Nationally and locally, death rates were significantly higher for male residents than female residents (Figure 14). This skew is much greater than that seen for hospitalisations and in the opposite direction to that observed for the rates of reported cases of COVID-19.

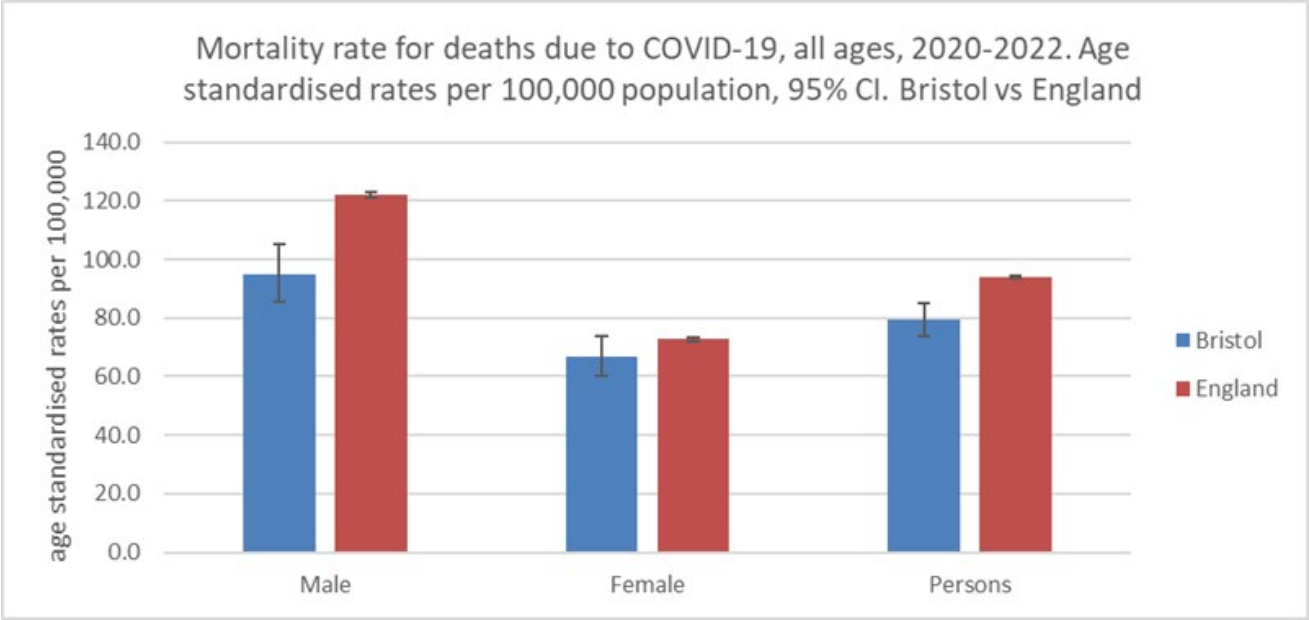

Figure 14: Mortality rate for deaths due to COVID-19 by sex, all ages, 2020-2022, Bristol and England.

Vaccinations

The national vaccination programme commenced in December 2020 with the delivery of a first vaccine dose to everyone in the top four priority groups (as identified by the Joint Committee on Vaccination and Immunisation) including all residents in a care home for older adults and their carers, and all those 70 years of age and over. This was rolled out over time to include all adults, children aged 16-17 years and 12 to 15 year olds, and 5 to 11 year olds deemed at high risk.

COVID-19 Vaccinations started in Bristol on 8th December 2020 and by 29th March 2023, 75% of adults (16+ years) in Bristol had received 2 doses for COVID-19 and 61% had received a booster/third dose. Figure 15 overleaf shows the breakdown by age and compares Bristol to

the local health system across Bristol, North Somerset and South Gloucestershire (BNSSG), South West region and England overall.

	1st dose - Coverage			2nd dose - Coverage			3rd dose - Coverage		
	Bristol	**BNSSG**	*ENG*	**Bristol**	**BNSSG**	*ENG*	**Bristol**	**BNSSG**	*ENG*
12yrs+	77%	82%	*78%*	73%	78%	*75%*	58%	65%	*59%*
16yrs+	**79%**	**83%**	***80%***	**75%**	**80%**	***77%***	**61%**	**68%**	***63%***
60yrs+	**93%**	**95%**	*93%*	**92%**	**95%**	*92%*	**88%**	**92%**	*89%*
50-59yrs	**86%**	**90%**	*87%*	**84%**	**88%**	*86%*	**75%**	**81%**	*76%*
40-49yrs	**78%**	**82%**	*78%*	**75%**	**80%**	*75%*	**62%**	**68%**	*60%*
30-39yrs	**73%**	**76%**	*70%*	**69%**	**72%**	*66%*	**53%**	**56%**	*46%*
18-29yrs	**72%**	**75%**	*68%*	**66%**	**69%**	*62%*	**45%**	**48%**	*38%*
16-17yrs	**58%**	**66%**	*62%*	**45%**	**54%**	*49%*	**12%**	**15%**	*12%*
12-15yrs	**45%**	**52%**	*46%*	**35%**	**41%**	*35%*	**1%**	**2%**	*1%*
5-11yrs	**12%**	**14%**	*10%*	**8%**	**9%**	*7%*	**0%**	**0%**	*0%*

Figure 15 Vaccinations delivered between 08 Dec 20 and 29 Mar 23. Source: NHSEI

The estimated population uptake (18 years +) for 1 or more doses of COVID-19 vaccination in Bristol was 79.3% which is just below the England average but higher than most of the English core cities with the exception of Sheffield (figure 16). For 3 or more doses, uptake reduces to 62.3% with Bristol once again performing just below Sheffield and the England average but higher than the other core cities.

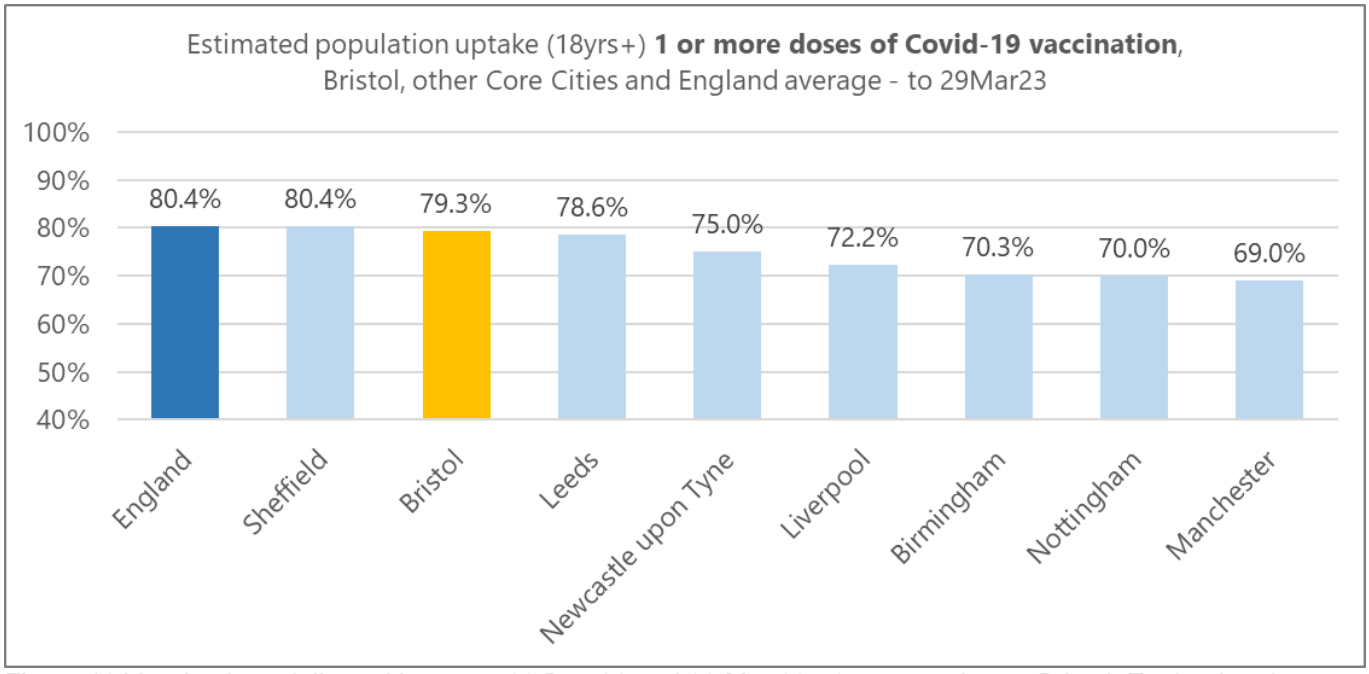

Figure 16 Vaccinations delivered between 08 Dec 20 and 29 Mar 23: 1 or more doses, Bristol, England and English Core Cities. Source: NHSEI

Since early 2022 a number of seasonal COVID-19 vaccination booster programmes have sought to ensure that the most vulnerable in the population have been offered additional doses of vaccination against COVID-19 infection and illness. In Spring 2022 (from March 2022 onwards) the booster programme targeted those aged 75 years or older and those with clinical vulnerabilities. In Bristol, 80% of residents aged 75 years and older received a vaccination as part of this offer.

The Autumn 2022 booster programme (September 2022 onwards) targeted all those aged 50 years or over, plus those with clinical vulnerabilities. 66% of Bristol residents aged 50 or over received a booster vaccination as part of this offer, and well over 80% of those aged 75 years or over.

During 2023/24 a Spring 2023 booster programme (from April to June 2023) offered an additional COVID-19 vaccination dose to all residents aged 75 years and older, plus those with clinical vulnerabilities. This was followed by an Autumn 2023 booster which targeted people aged 65 and over, residents in care homes for older people and anyone aged 6 months and over in a clinical risk group to protect them ahead of winter.

Data from the UK Health Security Agency (UKHSA) identified city take-up of the Autumn 2023 booster in the 65+ age group as 73.1% (Figure 17). By ethnic group it was possible to identify that only 29.6% of residents of Black or Black British ethnicity received the vaccination, significantly lower than residents of White ethnicity (77.2% take up).

Age-group	65 - 79yrs			80yrs+			65yrs+		
	All	*Female*	*Male*	All	*Female*	*Male*	All	*Female*	*Male*
Asian or Asian British	**46.6%**	*45.1%*	*48.3%*	**50.1%**	*43.3%*	*58.1%*	**47.3%**	*44.7%*	*50.3%*
Black or Black British	**27.2%**	*26.1%*	*28.4%*	**34.7%**	*32.3%*	*38.8%*	**29.6%**	*28.3%*	*31.2%*
Mixed	**47.4%**	*47.5%*	*47.3%*	**50.4%**	*50.0%*	*51.2%*	**48.0%**	*48.0%*	*48.0%*
Not Stated	**49.1%**	*55.0%*	*45.5%*	**61.2%**	*65.9%*	*56.3%*	**51.4%**	*57.4%*	*47.3%*
Other Ethnic Groups	**49.9%**	*51.5%*	*48.3%*	**64.8%**	*57.9%*	*75.5%*	**52.5%**	*52.8%*	*52.2%*
White	**75.6%**	*74.9%*	*76.3%*	**81.6%**	*80.8%*	*82.9%*	**77.2%**	*76.6%*	*77.9%*
Bristol average	**71.2%**	*70.9%*	*71.6%*	**78.2%**	*77.4%*	*79.5%*	**73.1%**	*72.8%*	*73.5%*

Figure 17: Autumn 2023 Booster vaccination take up in Bristol Source: UKHSA

Long COVID

Local intelligence on long COVID is not yet available but has been defined as 'signs and symptoms that develop during or following an infection consistent with COVID-19 which continue for more than 12 weeks and are not explained by an alternative diagnosis' (NICE guideline scope). The Office for National Statistics (ONS) have produced a report on on-ongoing symptoms following COVID-19 infection based upon surveys the organisation has performed on self- reported symptoms of respondents who have been infected with COVID-19 in the past (Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK - Office for National Statistics (ons.gov.uk).

According to the Winter Coronavirus (COVID-19) Infection Study[2] which was carried out between November 2023 and March 2024, an estimated 3.3% (2 million) people living in private households in England and Scotland were experiencing long COVID (symptoms continuing for more than four weeks after a confirmed or suspected coronavirus (COVID-19) infection that were not explained by something else). If the same level of prevalence applied to Bristol that would mean approximately 16,000 Bristol residents experiencing self-reported long Covid during last winter.

The same survey indicated that in England and Scotland, long COVID symptoms adversely affected the day-to-day activities of 1.5 million people (74.7% of those with self-reported long

[2] Self-reported coronavirus (COVID-19) infections and associated symptoms, England and Scotland - Office for National Statistics

COVID), with 381,000 (19.2% of those with self-reported long COVID) reporting that their ability to undertake their day-to-day activities had been "limited a lot". The most common symptom reported as part of an individual's experience of long COVID was weakness or tiredness (54.0%) followed by shortness of breath (43.7%), difficulty concentrating (39.4%) and muscle ache (36.7%).

Further data / links:

- Bristol COVID-19 web pages - https://www.bristol.gov.uk/coronavirus/what-you-need-to-know
- Office for National Statistics COVID-19 web pages - https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases
- UK Government COVID-19 data dashboard - https://coronavirus.data.gov.uk/
- UK Health Security Agency - UK Health Security Agency - GOV.UK

Date updated: September 2024 **Next update due**: May 2025

Analysts: Tracy Mathews – Tracy.Mathews@bristol.gov.uk
David Thomas – David.Thomas@bristol.gov.uk

Consultants in Public Health: Julie Northcott - Julie.Northcott@bristol.gov.uk
Katie Porter – Katie.Porter@bristol.gov.uk