Mortality Trends in Gloucestershire

An Overview

(2023 Data)

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Contents

Data Source:

NOMIS (Office for National Statistics), Mortality Statistics - underlying cause, sex and age

Office for National Statistics, Avoidable mortality by local authorities in England and unitary authorities in Wales

1.0 Gloucestershire deaths registered in 2023

In 2023 there were 6,983 deaths registered in Gloucestershire, equivalent to a crude death rate[1] (CDR) of 1,059.2 deaths per 100,000 population. This rate was higher than the England average, but lower than the South West average, which saw crude death rates of 943.1 and 1,083.4 per 100,000 population respectively, as shown in Table 1.

Table 1: Death registrations in Gloucestershire and its districts, 2023

	Number of deaths registered	Crude death rate (per 100,000 population)
Gloucestershire	6,983	1,059.2
Cheltenham	1,282	1,066.1
Cotswold	1,056	1,154.2
Forest of Dean	1,049	1,177.3
Gloucester	1,295	959.3
Stroud	1,348	1,082.4
Tewkesbury	953	963.6
South West	62,962	1,083.4
England	544,054	943.1
England & Wales	580,108	953.3

1.1 District focus

- The highest number of registered deaths in Gloucestershire's districts was in Stroud which registered 1,348 deaths in 2023. However, Forest of Dean had the highest crude death rate at 1177.3 deaths per 100,000 population.
- The lowest number of district deaths in 2023 was in Tewkesbury where 953 deaths were registered. However, Gloucester had the lowest crude death rate at 959.3 deaths per 100,000 population.

2.0 Registered deaths from 1991-2023

The number of deaths and crude mortality rate in 2023 remained high and above pre-covid levels, which is in-line with the previous 3 years. However, in 2023 there was 55 fewer deaths compared to 2022, representing a lower crude death rate of 19.2 fewer deaths per 100,000 population.

2022 saw the highest number of deaths registered in Gloucestershire since 1991, with 7,038 deaths. The second highest level occurred in 2020, when deaths due to the coronavirus pandemic were at their peak, and 7,002 deaths were registered. However, the crude death

[1] The crude death rate is the number of deaths occurring in a year divided by the total population at mid-year, of a given area. It is expressed per 1,000 population.

rate in 2022 was 1,078 deaths per 100,000 population, which was lower than that seen in 2020 (1,093.1 CDR). This was probably due to a large increase in the general population of Gloucestershire during this period, which lowered the crude rate.

Since 1991 the number of deaths registered has fluctuated. However, it can be inferred that during the past 10 years there has been a trend of increasing numbers of registered deaths as well as increasing crude death rates compared to the decreasing trends prior to 2011, as indicated in Figure 1.

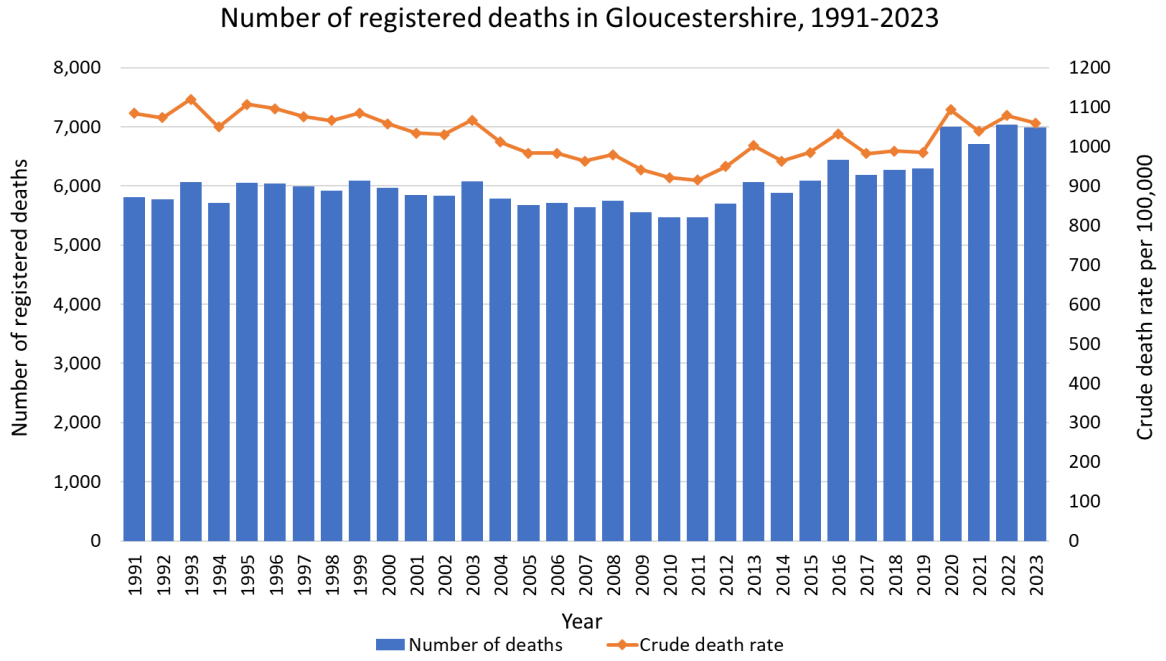

Figure 1: Registered deaths in Gloucestershire, 1991-2023

2.1 District focus

- Figure 2, placed below, indicates Stroud has registered the largest number of deaths every year since 2004, except for 2022 when Gloucester had the highest number of registered deaths.
- Tewkesbury has registered the lowest number of deaths for most years, except for 2005, 2009, 2016 and 2019.
- Three of the districts (Cheltenham, Forest of Dean and Stroud) saw a rise in the number of registered deaths between 2022 and 2023 and the other three districts (Cotswold, Gloucester and Tewkesbury) saw a decline in the number of registered deaths between 2022 and 2023. Cheltenham had the biggest increase with 63 additional deaths (5.2% increase on 2022) while Gloucester had the biggest decrease of 72 deaths (5.3% decrease on 2022).
- There is high fluctuation in the district crude death rates and order of highest to lowest for each year, as indicated in Figure *3*. However, Gloucester does stand out as having a lower crude death rate in most of the years compared to the other districts, this is reflective of Gloucester having a more youthful population structure.

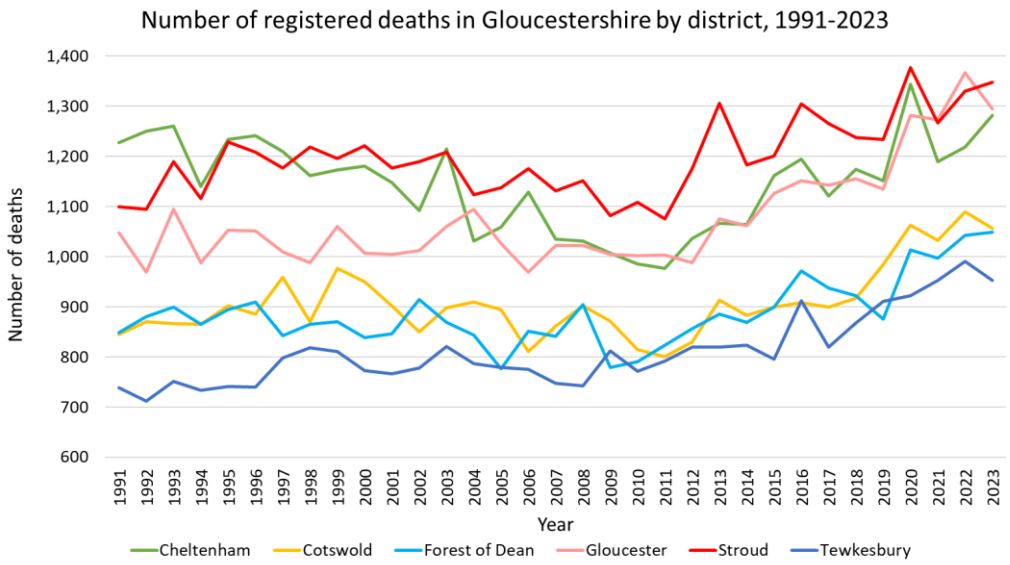

Figure 2: Registered deaths in Gloucestershire by district, 1991-2023

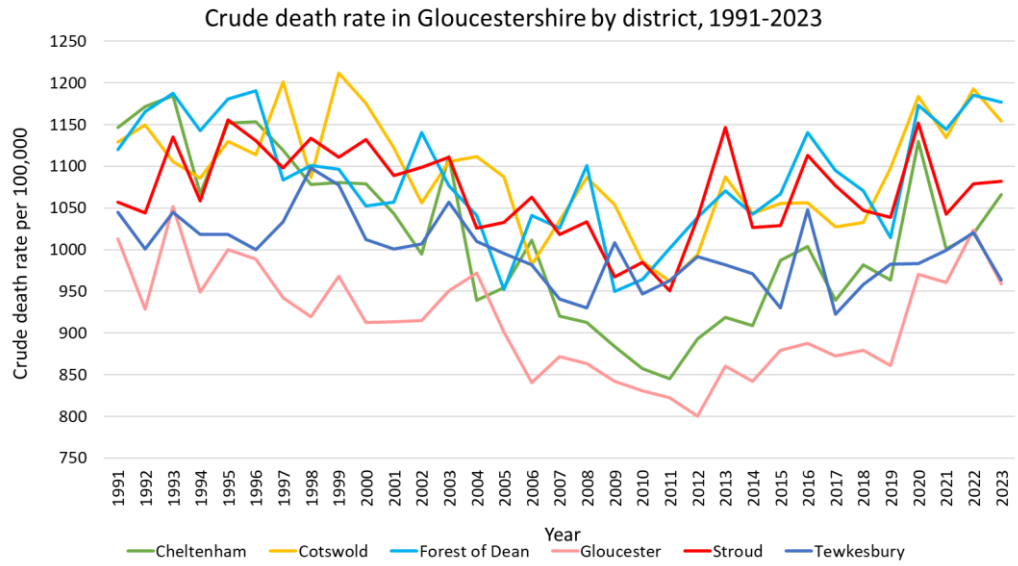

Figure 3: Crude death rate in Gloucestershire by district, 1991-2023

3.0 Age standardised mortality rates

Age standardisation is a process which accounts for the structural age differences between populations when calculating rates. The World Health Organization defines the age standardised mortality rate (ASMR) as a "weighted average of the age-specific mortality rates per 100,000 persons, where the weights are the proportions of persons in the corresponding age groups of the WHO standard population".[2] This therefore allows more accurate comparisons to be made between sub-populations, for example between districts, sex, and years. Age standardisation produces a lower rate when the standard population is

[2] World Health Organization. Age-standardized mortality rate (per 100 000 population) (who.int)

younger than the population being studied. This is because the risk of disease is highest in the older age groups.

Using the age standardised mortality rates, the data in Table 2 shows that in 2023 Gloucestershire had an ASMR of 918.4 deaths per 100,000 people. Gloucestershire had a slightly higher level of mortality than the South West (913.7 ASMR), but a lower level of mortality than England overall (964.5 ASMR). The differences between the crude rates and age standardised rates are explained by Gloucestershire and the South West having older populations than England overall.

Table 2: Age standardised mortality rates in Gloucestershire and districts, 2023

	ASMR per 100,000 population
Gloucestershire	918.4
Cheltenham	957.5
Cotswold	825.6
Forest of Dean	948.4
Gloucester	1058.4
Stroud	895.5
Tewkesbury	824.8
South West	913.7
England	964.5
England & Wales	969.5

Comparing Gloucestershire's age standardised mortality rate to the South West, Figure 4 indicates that 2016 and 2020 represent the only years when Gloucestershire has had a significantly higher age standardised mortality rate.[3] In all other years shown on the graph, the differences are not statistically significant. In contrast, for all years except 2016, England has had a significantly higher age standardised mortality rate than Gloucestershire and the South West.

[3] Confidence intervals, the black bars on each data point, have been used in Figure 4 to understand whether the differences in rates seen by Gloucestershire, the South West and England are statistically significantly different.

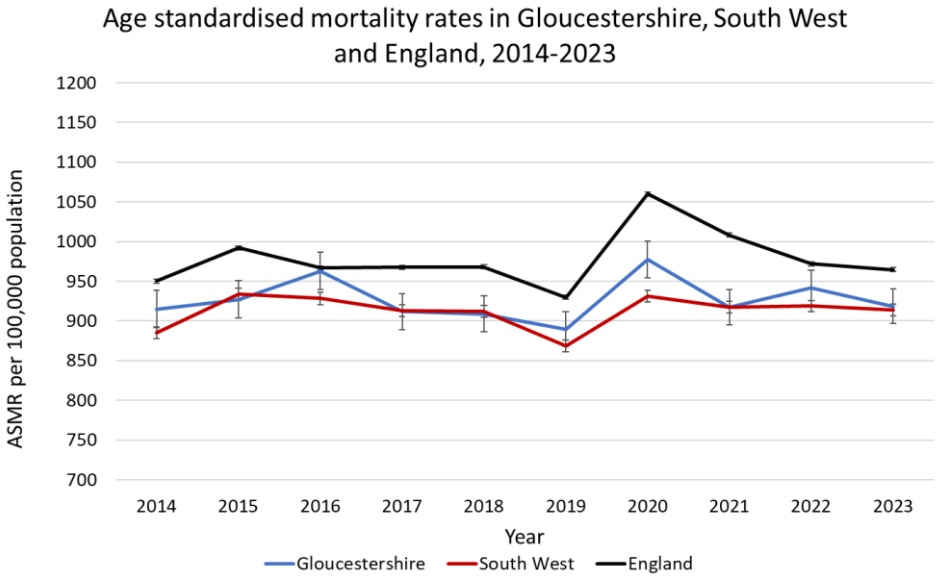

Figure 4: Age standardised mortality rates in Gloucestershire, South West and England, 2014-2023

3.1 District focus

- The highest district age standardised mortality rate in Gloucestershire in 2023 was in Gloucester, which had an ASMR of 1,058.4. In 2023, Gloucester had a statistically significantly higher ASMR than Cotswold, Stroud and Tewkesbury.
- The lowest ASMR of Gloucestershire's districts was in Tewkesbury district, with an ASMR of 825.6. Tewkesbury's ASMR was only significantly lower than the ASMR of Gloucester, Cheltenham and Forest of Dean.
- Each year between 2014-2023 Gloucester had the highest ASMR, which peaked in 2022, as shown in Figure 5. The confidence intervals indicate that Cotswold and Tewkesbury are the only districts to consistently have a statistically significantly lower ASMR than Gloucester between 2014 and 2023.
- Cotswold has generally had the lowest ASMR in the county, however its ASMR rose above the Tewkesbury rate in 2020.
- Generally, the age standardised mortality rates have decreased in the districts since the peaks in 2020 and 2022 caused by the pandemic. However, these changes are not statistically significant.
- All districts saw a reduction in the ASMR between 2022 and 2023, with exception of Cheltenham which has a ASMR above the rates for 2021 and 2022. However, these changes in ASMR between 2022 and 2023 are not statistically significant.

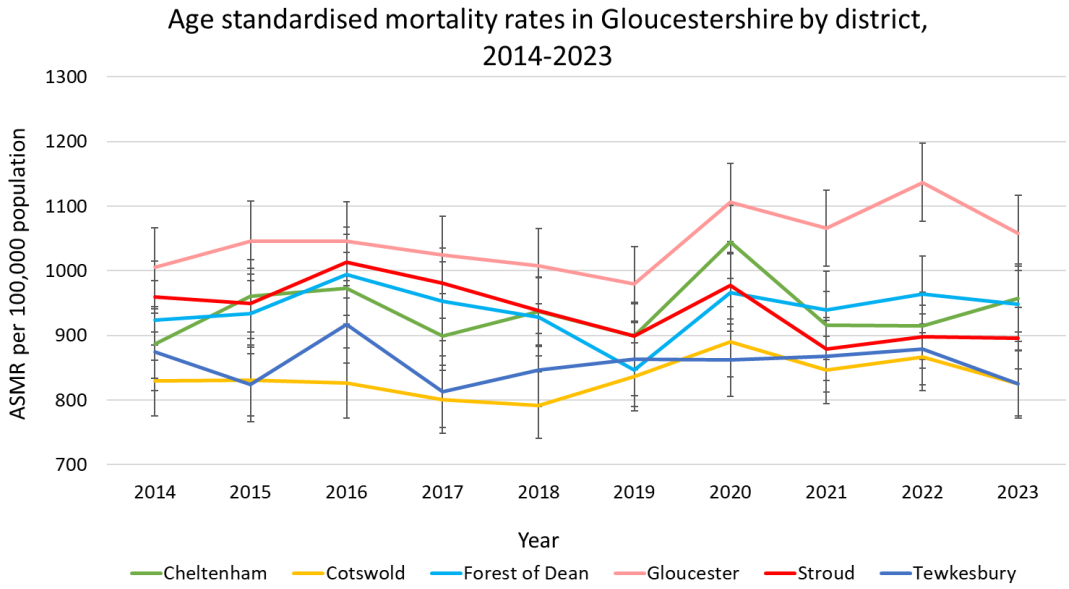

Figure 5: Age standardised mortality rates in Gloucestershire and its districts, 2014-2023

4.0 Deaths by age and sex[4]

Overall, Table 3 indicates the number of deaths increases the older the age group - the highest proportion of deaths occurring in 2023 was in the 80+ age group for all areas. This reflects Gloucestershire's age structure, which is representative of an ageing population. In Gloucestershire 59.8% of deaths were in the 80+ year old age group, this was equivalent to the South West (59.8%), but higher than England (55.3%).

In 2023, 50.4% of all deaths in Gloucestershire were male compared to 49.6% female. In comparison, 50.8% were male in England, and 50.4% in the South West.

[4] Due to small numbers of deaths when the data is broken down by sex and age, rounding has been applied to protect the confidentiality of individuals. Counts of 0, 1 and 2 are rounded to 0 and counts of 3, 4 and 5 are rounded to 5. For further information see: https://www.nomisweb.co.uk/datasets/mortsa

Table 3: Proportion of registered deaths by sex and age in Gloucestershire and its districts, 2023

	Male	Female	0-14	15-34	35-64	65-79	80+
Gloucestershire	50.4%	49.6%	0.5%	0.8%	11.7%	27.3%	59.8%
Cheltenham	49.0%	51.0%	0.0%	1.2%	11.2%	24.3%	63.0%
Cotswold	48.0%	52.0%	0.5%	0.0%	10.2%	25.8%	63.2%
Forest of Dean	51.9%	48.1%	0.6%	0.5%	10.3%	27.6%	60.4%
Gloucester	53.5%	46.5%	0.6%	0.8%	15.4%	30.5%	52.4%
Stroud	49.4%	50.6%	0.0%	0.5%	11.6%	27.7%	59.4%
Tewkesbury	50.6%	49.4%	0.5%	0.0%	10.3%	27.8%	61.3%
South West	50.4%	49.6%	0.3%	0.9%	11.3%	27.7%	59.8%
England	50.8%	49.2%	0.6%	1.2%	13.8%	29.1%	55.3%
England & Wales	50.8%	49.2%	0.6%	1.2%	13.8%	29.3%	55.1%

Comparing the differences by sex in Figure 6, 67.3% of total female deaths occurred in the 80 and above age group, compared to 52.3% of male deaths. However, the 65–79-year-old age group accounts for a higher proportion of total male deaths (32.4%) than female deaths (22.1%). This is also reflected in all the younger age groups, where males have a higher overall proportion of deaths than females. The data is reflective of trends in life expectancy. Females have been identified to have a higher life expectancy and therefore, we can expect to see a higher proportion of female deaths occurring in the older age categories compared to males.

Comparing 2023 to ten years previously in 2014, the pattern has shown minimal change. There has been an increase in the proportion of male deaths at age 80 and over, suggesting that a greater proportion of males are now living longer. However, the proportion of deaths of females in this age group has decreased; there is now a higher proportion of female deaths within the younger age group of 65-79. Overall, the proportion of deaths for females in the older age group of 80+ in 2023 is still much higher for females (67.3%) than males (52.3%), although the difference has slightly diminished. Consequently, there continues to be higher proportions of deaths in all age brackets up to the age of 79 for males compared to females.

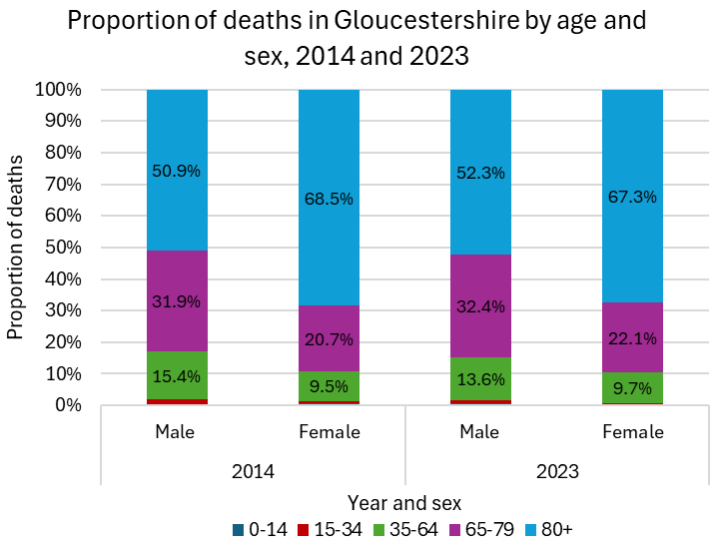

Figure 6: Proportion of registered deaths in Gloucestershire by sex and age in 2014 and 2023

4.1 District focus

- Forest of Dean, Gloucester and Tewkesbury had a higher proportion of male deaths than female deaths in 2023.
- The highest proportion of deaths over the age of 80 was in Cotswold at 63.2% whereas the lowest proportion was in Gloucester with 52.4% of deaths occurring in people over the age of 80, as indicated by Table 3. The data is reflective of the population structure in these districts, Cotswold's population is at a more advanced stage of ageing which means that a higher proportion of its population is living to the age of 80+ and dying in that age category. Gloucester has a lower proportion of its population living to older ages therefore, a lower proportion of its population is dying in the 80+ age category.
- There were no deaths of children aged between 0-14 in Cheltenham or Stroud, however Cotswold, Forest of Dean, Gloucester and Tewkesbury all had a proportion of 0.5-0.6% deaths occurring in young children.
- Gloucester had the highest proportion of 15–64-year-old deaths (approximating the working age population), accounting for around 16.2% of deaths in the district; conversely, Cotswold had the lowest proportion of deaths occurring in this age group, equivalent to 10.2% of all deaths in the district. This is reflective of the population age structure in these districts.

5.0 Leading causes of death in Gloucestershire

Out of 47 identified leading causes of death in Gloucestershire in 2023, Figure 7 shows the three main causes of death were Cancer (malignant neoplasms) accounting for 1,763 deaths (25.2% of deaths), Dementia and Alzheimer disease with 817 deaths (11.7% of deaths), and

Ischaemic heart diseases with 691 deaths (9.9% of deaths). These were also the main three leading causes of death in both England and the South West.

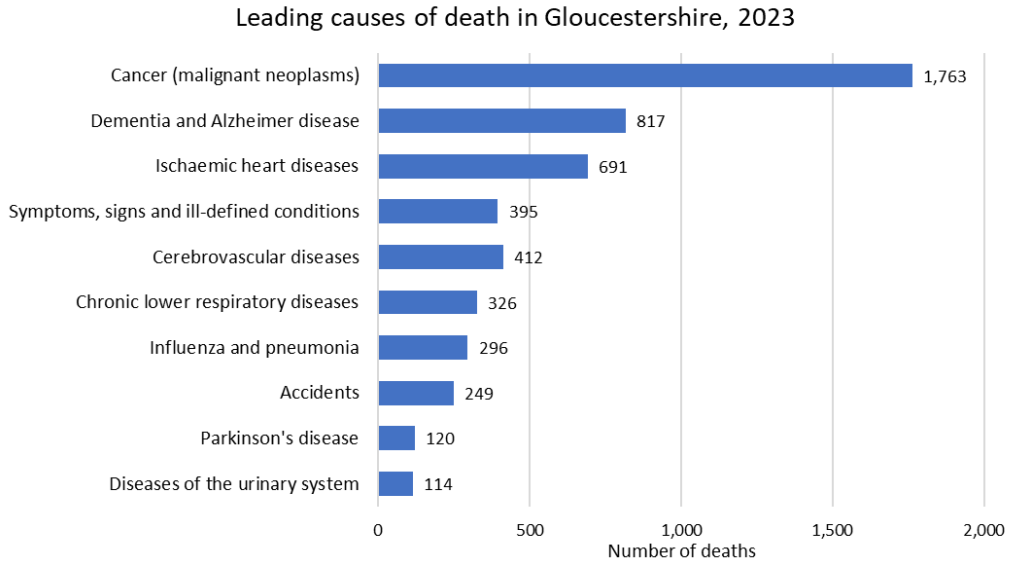

Figure 7: Top 10 leading causes of death in Gloucestershire, 2023[5]

5.1 Change in leading causes of death between 2022 and 2023

The change in number of deaths occurring in the top 10 leading causes of deaths between 2022-2023 is given in Figure 8. Between 2022 and 2023 the largest increase in the number of deaths by leading cause was Influenza and Pneumonia (+53 deaths, 21.8% increase). The largest decrease was COVID-19 with 166 fewer deaths occurring in 2023 compared to 2022 (60.6% decrease). Noticeably there has been 85 fewer deaths due to Cancer (malignant neoplasms) (4.6% reduction) in 2023. A rise in late cancer diagnoses and deaths had been anticipated because of national lockdowns during the COVID-19 pandemic when cancer screening was suspended and routine diagnostic work deferred. However, the numbers suggest this impact on mortality may be reducing.

[5]The leading causes of death classification is based on a list developed by the World Health Organization (WHO) and each entry is an aggregation of the very detailed ICD-10 list. The leading causes classification does not include all causes, consequently summing counts for all leading causes will not equal the figure for total mortality. For more information see: Nomis - Official Census and Labour Market Statistics - Nomis - Official Census and Labour Market Statistics (nomisweb.co.uk)

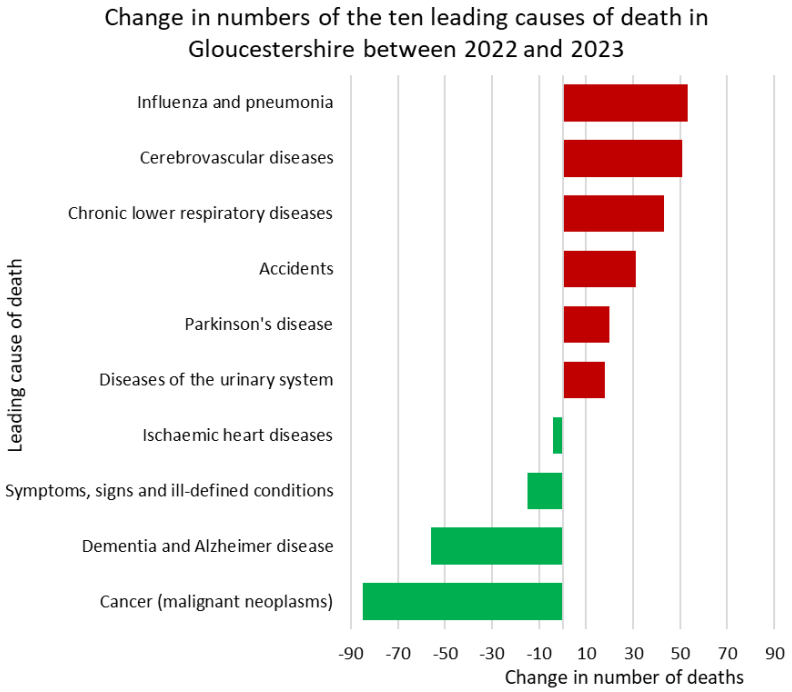

Figure 8: Change in numbers of the ten leading causes of death in Gloucestershire between 2022 and 2023

5.2 Change in numbers of leading causes of death in Gloucestershire between 2020 and 2023

Over the last ten-year period, 2020 saw the highest annual death rates in Gloucestershire, predominantly due to the COVID-19 pandemic. Consequently, the most noticeable change in the number of deaths in Gloucestershire since 2020 is the reduction in deaths due to COVID-19. In 2023 there were 108 deaths from COVID-19 - a reduction of 643 (85.6% fewer deaths) from the 751 deaths in 2020. This reduction is reflected country wide.

The largest total increase in deaths in Gloucestershire comparing 2023 to 2020 was for Chronic lower respiratory diseases; there were 326 deaths in 2023, which was 61 more during the year (23.0% increase) than in 2020.

A rise in late cancer diagnoses and deaths had been anticipated as a result of national lockdowns during the COVID-19 pandemic when cancer screening was suspended and routine diagnostic work deferred. The data indicates there was a steep rise between 2021 and 2022 however, the number of deaths due to cancer is indicated to have decreased in 2023. This trend in cancer deaths is also reflected country wide.

6.0 Leading causes of death by sex

Looking at the leading causes of death by sex, shown in Table 4, Cancer (neoplasms) was the leading cause of death for both males (944 deaths, 26.8% of male deaths,) and females (819 deaths, 23.7% of female deaths) in Gloucestershire. Dementia and Alzheimer's was the

second highest cause of death in women, leading to 14.5% (503) of female deaths, whilst Ischaemic heart diseases were the second highest cause of deaths in men, accounting for 13.1% (462) of male deaths. Comparing the greatest differences between the number of deaths by cause and sex, males had 233 more deaths occurring than females (50.4% higher) for Ischaemic heart disease whilst females had 189 more deaths than males occurring due to Dementia and Alzheimer disease (60.2% higher).

Table 4 - Leading Causes of Male and Female Deaths in Gloucestershire, 2023

Top 10 causes of male deaths			Top 10 causes of female deaths		
Cause of death	Number of male deaths	Percentage of male deaths	Cause of death	Number of female deaths	Percentage of female deaths
Cancer (malignant neoplasms)	944	26.8%	Cancer (malignant neoplasms)	819	23.7%
Ischaemic heart diseases	462	13.1%	Dementia and Alzheimer disease	503	14.5%
Dementia and Alzheimer disease	314	8.9%	Symptoms, signs and ill-defined conditions	269	7.8%
Cerebrovascular diseases	175	5.0%	Cerebrovascular diseases	237	6.8%
Chronic lower respiratory diseases	167	4.7%	Ischaemic heart diseases	229	6.6%
Accidents	142	4.0%	Influenza and pneumonia	166	4.8%
Influenza and pneumonia	130	3.7%	Chronic lower respiratory diseases	159	4.6%
Symptoms, signs and ill-defined conditions	126	3.6%	Accidents	107	3.1%
Parkinson's disease	74	2.1%	Heart failure and complications and ill-defined heart disease	61	1.8%
Cirrhosis and other diseases of liver	73	2.1%	Diseases of the urinary system	57	1.6%
Total male deaths	3,520		Total female deaths	3,463	

6.1 District focus

- In 2023, Cancer (malignant neoplasms), Dementia and Alzheimer disease, and Ischaemic heart diseases were also the three main causes of death in all districts in Gloucestershire, as shown in Table 5.
- Cancer was the leading cause of death for all districts, with Cotswold having the largest proportion of deaths at 26.4%, as indicated in Table 6.
- Dementia and Alzheimer disease was the second largest cause of death for 4 out of 6 of the districts, with Cheltenham having the largest proportion of deaths at 15.3%. The second largest cause of death for Gloucester and Stroud was Ischaemic heart diseases, accounting for 11.0% and 9.8% of deaths respectively.

Table 5: Number of deaths in Gloucestershire, SW, England, and Districts for top 10 leading causes of death in Gloucestershire, 2023

Cause of death	Cheltenham	Cotswold	Forest of Dean	Gloucester	Stroud	Tewkesbury	Gloucestershire	South West	England
All causes	1,282	1,056	1,049	1,295	1,348	953	6,983	62,962	544,054
Cancer (malignant neoplasms)	294	279	264	337	350	239	1,763	16,162	139,545
Dementia and Alzheimer disease	196	128	128	131	125	109	817	7,435	63,056
Ischaemic heart diseases	127	100	90	142	132	100	691	5,675	53,868
Symptoms, signs and ill-defined conditions	61	60	67	76	82	66	412	3,499	27,601
Cerebrovascular diseases	72	66	53	42	123	39	395	3,015	19,449
Chronic lower respiratory diseases	55	32	53	86	63	37	326	3,043	29,949
Influenza and pneumonia	54	57	38	59	50	38	296	2,730	22,666
Accidents	52	25	35	52	48	37	249	2,033	18,118
Parkinson's disease	17	18	17	18	28	22	120	957	7,518
Diseases of the urinary system	21	13	19	23	21	17	114	921	8,049

Table 6: Percentage of deaths in Gloucestershire, SW, England, and Districts for main 10 leading causes of death in Gloucestershire, 2023

Cause of death	Cheltenham	Cotswold	Forest of Dean	Gloucester	Stroud	Tewkesbury	Gloucester	South West	England
Cancer (malignant neoplasms)	22.9%	26.4%	25.2%	26.0%	26.0%	25.1%	25.2%	25.7%	25.6%
Dementia and Alzheimer disease	15.3%	12.1%	12.2%	10.1%	9.3%	11.4%	11.7%	11.8%	11.6%
Ischaemic heart diseases	9.9%	9.5%	8.6%	11.0%	9.8%	10.5%	9.9%	9.0%	9.9%
Symptoms, signs and ill-defined conditions	4.8%	5.7%	6.4%	5.9%	6.1%	6.9%	5.9%	5.6%	5.1%
Cerebrovascular diseases	5.6%	6.3%	5.1%	3.2%	9.1%	4.1%	5.7%	4.8%	3.6%
Chronic lower respiratory diseases	4.3%	3.0%	5.1%	6.6%	4.7%	3.9%	4.7%	4.8%	5.5%
Influenza and pneumonia	4.2%	5.4%	3.6%	4.6%	3.7%	4.0%	4.2%	4.3%	4.2%
Accidents	4.1%	2.4%	3.3%	4.0%	3.6%	3.9%	3.6%	3.2%	3.3%
Parkinson's disease	1.3%	1.7%	1.6%	1.4%	2.1%	2.3%	1.7%	1.5%	1.4%
Diseases of the urinary system	1.6%	1.2%	1.8%	1.8%	1.6%	1.8%	1.6%	1.5%	1.5%

7.0 Leading causes of death: Rates (ASMR)[6]

Age standardised mortality rates, represented in Figure 9 show that Gloucestershire had a lower mortality rate than the South West and England for the main cause of death Cancer (232.1 Gloucestershire ASMR per 100,000 vs. 236.9 South West and 246.7 England). The Cancer rate is significantly lower in Gloucestershire than England and lower than the South West, with a rate of 14.6 fewer deaths per 100,000 population than England, and 4.8 fewer than the South West. However, the county had higher age standardised mortality rates than the South West for the other two main causes of death (Dementia and Alzheimer disease, and Ischaemic heart diseases) but these rates were still lower than England overall.

The largest difference between Gloucestershire and the South West and England was for Symptoms, signs and ill-defined conditions as a cause of death, where Gloucestershire saw 16.8 more deaths per 100,000 population than England, and 9.0 per 100,000 more than the South West in 2023.

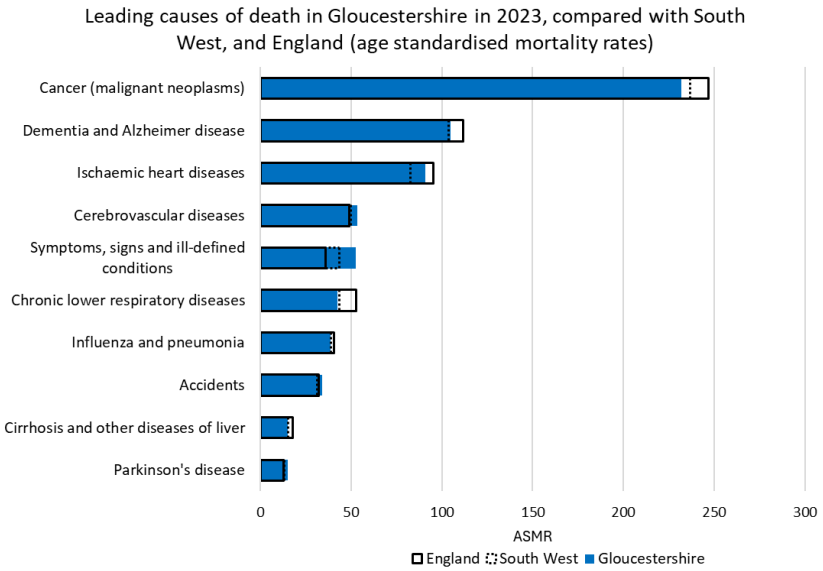

Figure 9: Leading causes of death in Gloucestershire, compared with South West and England (ASMR), 2023

8.0 Avoidable mortality in 2020-2022[7]

Avoidable mortality is defined by the Office for National Statistics as deaths that are preventable or treatable[8]. Preventable deaths are causes of death that can be "mainly avoided through effective public health and primary prevention interventions (that is,

[6] Confidence interval analysis is not included due to lack of data availability.
[7] Data source: Avoidable mortality by local authorities in England and unitary authorities in Wales, Office for National Statistics. Available at: Avoidable mortality by local authorities in England and unitary authorities in Wales - Office for National Statistics
[8] ONS, 2022. Avoidable mortality in the UK QMI - Office for National Statistics

before the onset of diseases or injuries, to reduce incidence)"[9] whereas, treatable mortality is defined as "causes of death that can mainly be avoided through timely and effective healthcare interventions, including secondary prevention and treatment (that is, after the onset of disease, to reduce case-fatality)"[10]. For more detail about the causes of death classed as avoidable, please see Appendix A.

The number of avoidable deaths in 2020-2022 occurring in Gloucestershire, its districts, the South West and England is given in Table 7. Between 2020-2022[11], there was 4,064 avoidable deaths in Gloucestershire. Using age standardised rates this is equivalent to a rate of 218.5 avoidable deaths per 100,000 population. Comparing to the South West rate of 211.1 deaths per 100,000 (34,769 deaths), Gloucestershire had a lower rate of avoidable deaths however the difference was not statistically significant. Gloucestershire did have a significantly lower avoidable death rate than England where 253.0 deaths occurred per 100,000 as indicated in Figure 10.

Table 7: Number of avoidable deaths registered in 2020-2022

	Number of avoidable deaths registered 2020-2022
Gloucestershire	4,064
Cheltenham	713
Cotswold	506
Forest of Dean	613
Gloucester	947
Stroud	723
Tewkesbury	562
South West	34,769
England	374,950

[9] *Ibid.*
[10] *Ibid.*
[11] Three-year aggregates are used to increase the reliability of the estimates due to a small number of deaths occurring in some local authorities

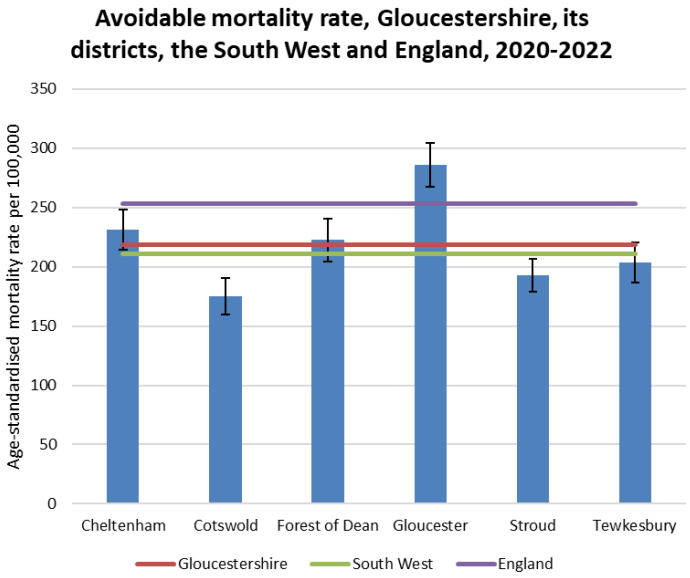

Figure 10: Avoidable mortality rate, Gloucestershire and its districts, 2020-2022

8.1 District focus

- Between 2020-2022, Gloucester had the highest number of avoidable deaths and highest avoidable mortality rate with 947 deaths and a rate of 285.9 avoidable deaths per 100,000 population. This rate is significantly higher than the Gloucestershire, South West and England rates.
- The lowest number of avoidable deaths and the lowest avoidable mortality rate between 2020-2022 was in Cotswold with 506 deaths and a rate of 175.1 deaths per 100,000 population. This rate is significantly lower than the Gloucestershire, South West and England rates.

9.0 Number of avoidable deaths in Gloucestershire between 2001-2003 and 2020-2022

The period 2020-2022 saw the highest number of avoidable deaths occurring in Gloucestershire since 2001-2003, as shown in Figure 11. An additional 81 avoidable deaths, equivalent to an 2.0% increase, took place in 2020-2022 compared to the previous period 2019-2021. In general, since 2013-2015 there has been an increasing trend in the number of avoidable deaths taking place in Gloucestershire.

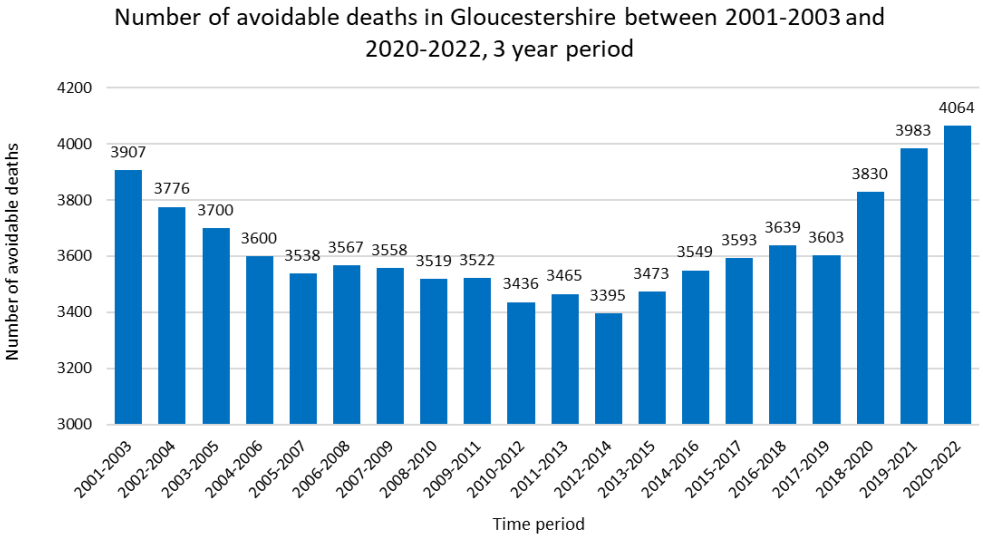

Figure 11: Number of avoidable deaths in Gloucestershire between 2001-2003 and 2020-2022, 3 year period

10.0 Avoidable mortality rate change in Gloucestershire between 2001-2003 and 2020-22

Generally, there was a decreasing trend in Gloucestershire's age standardised avoidable mortality rate between 2001-2003 and 2017-2019 as shown by Figure 12. However, since then there has been a year-on-year increase with 218.5 avoidable deaths per 100,000 population between 2020-2022, an increase of 3.4 avoidable deaths per 100,000 population compared to 2019-2021. The increase in rate can be attributed to the COVID-19 pandemic which is classed as an avoidable- preventable death. The increase seen during the pandemic is statistically significant when comparing the 2017-2019 data to the periods 2019-2021 and 2021-2023, this is indicated by the confidence intervals shown in Figure 12.

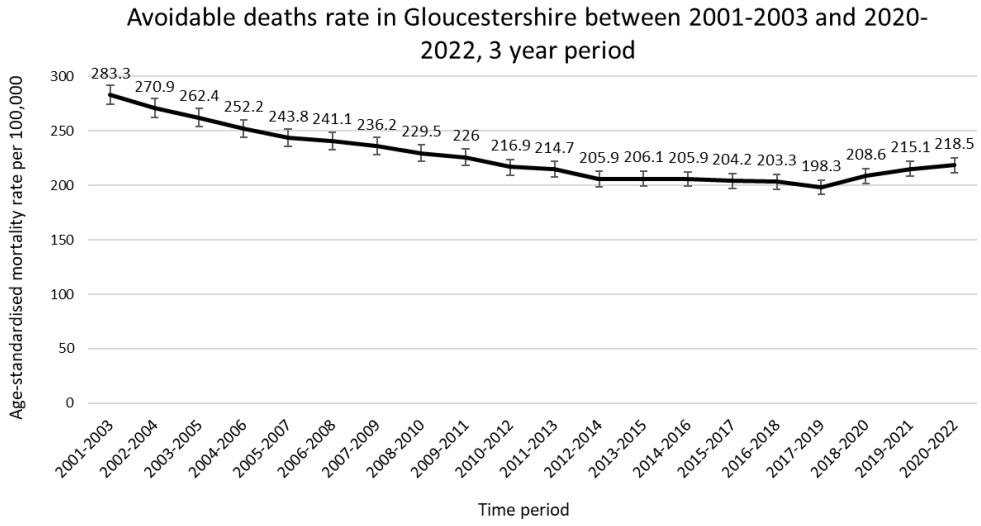

Figure 12: Avoidable death rate in Gloucestershire between 2001-2003 and 2020-2022, 3 year period

11.0 Treatable and preventable deaths

Avoidable mortality can be broken down into treatable and preventable deaths. Preventable deaths are causes of death that can be "mainly avoided through effective public health and primary prevention interventions (that is, before the onset of diseases or injuries, to reduce incidence)"[12] whereas, treatable mortality is defined as "causes of death that can mainly be avoided through timely and effective healthcare interventions, including secondary prevention and treatment (that is, after the onset of disease, to reduce case-fatality)".[13]

In Gloucestershire, for every period shown in Figure 13, the number of preventable deaths outnumbered the number of treatable deaths. In 2020-2022 1,396 treatable deaths (34.4% of avoidable deaths) and 2,668 preventable deaths (65.6% of avoidable deaths) took place in Gloucestershire.

Between 2001-2003 and 2010-2012 there was a decreasing trend in the number of treatable deaths occurring in each three-year period; from 1,633 deaths to 1,264 deaths. However, since then there has been a year-on-year increase in the number of treatable deaths, except for 2012-2014, increasing from 1,264 deaths to 1,396 deaths. In comparison, the number of preventable deaths was steady with some fluctuation between 2001-2003 to 2017-2019 but there has been a noticeable increase for each three-year period since then, increasing from 2,264 deaths in 2017-2019 to 2,668 deaths in 2020-2022.

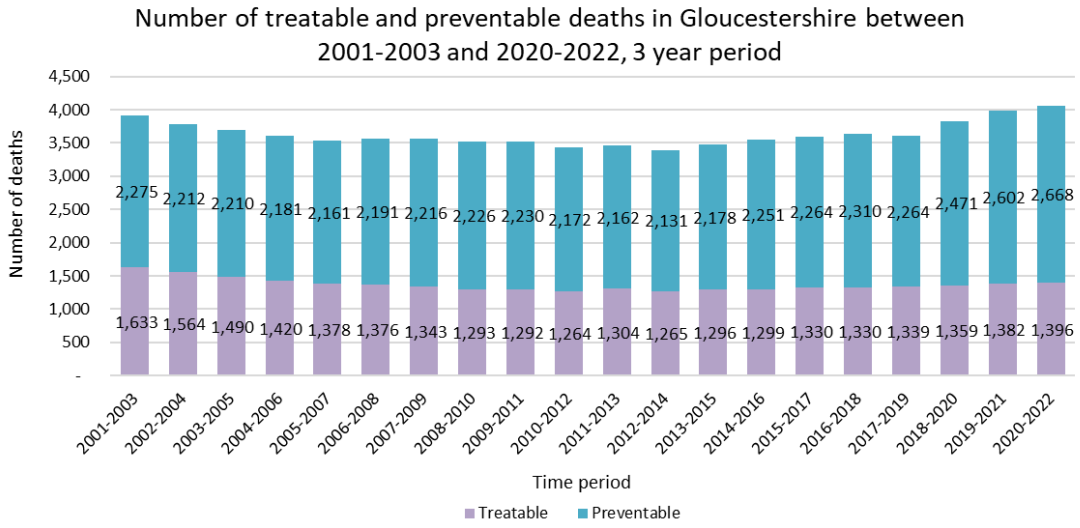

Figure 13: Number of treatable and preventable deaths in Gloucestershire between 2001-2003 and 2020-2022, 3 year period

12.0 Treatable and preventable mortality rate

Using a comparison of the treatable and preventable standardised mortality rates in Figure 14, throughout the period shown there has been a significantly higher preventable mortality

[12] ONS, 2022. Avoidable mortality in the UK QMI - Office for National Statistics
[13] *Ibid.*

rate than treatable. The rates provide further evidence for the increase in avoidable mortality being driven by an increase in preventable mortality and the COVID-19 pandemic. Between 2018-2020 (the start of the pandemic) and 2020-2022 (the middle of the pandemic), the treatable mortality rate increased by 1.2 percentage points however, the preventable mortality rate increased by 8.6 percentage points in Gloucestershire. This difference is reflective of the rates of increase seen at a national level.

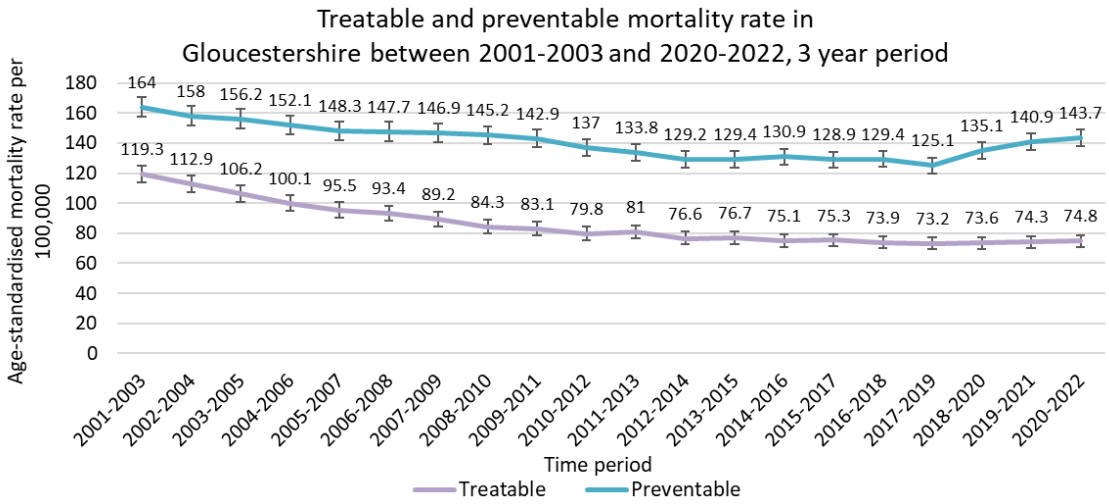

Figure 14: Treatable and preventable mortality rate in Gloucestershire between 2001-2003 and 2020-2022, 3 year period

13.0 Avoidable mortality by sex, with treatable and preventable mortality comparison

In Gloucestershire, there is a marked difference in the number of avoidable deaths occurring in males and females. Throughout the period shown in Figure 15 males have had a significantly higher avoidable mortality rate than females. Between 2001-2003 and 2017-2019 there was a narrowing of the mortality gap by sex however, between 2018-2020 and 2020-2022 there has been a significant increase in the male avoidable mortality rate which has rewidened the mortality gap with females. Differences in avoidable causes of death have been identified as contributors to the life expectancy gap between sexes. Differences in Ischaemic heart disease and injuries as a cause of death were identified to have the greatest contribution to the gap[14].

[14] Allel et al., 2021. The contributions of public health policies and healthcare quality to gender gap and country differences in life expectancy in the UK | Population Health Metrics | Full Text (Accessed 28/11/2025)

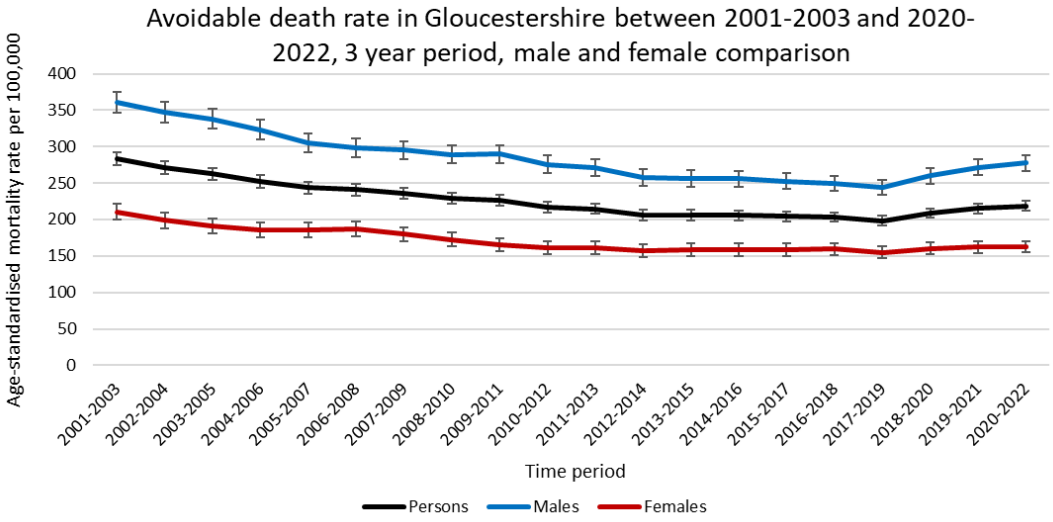

Figure 15: Avoidable mortality in Gloucestershire between 2001-2003 and 2020-2022, male and female comparison

By splitting avoidable mortality into treatable and preventable mortality, it can be inferred that the sex difference in avoidable mortality is being driven by the sex difference in preventable mortality. Figure 16 indicates that there are no significant differences between the male and female treatable mortality rate. One reason why there might have been a significant increase in the male preventable mortality rate is due to more COVID-19 deaths, classed as preventable, occurring in males than females.[15]

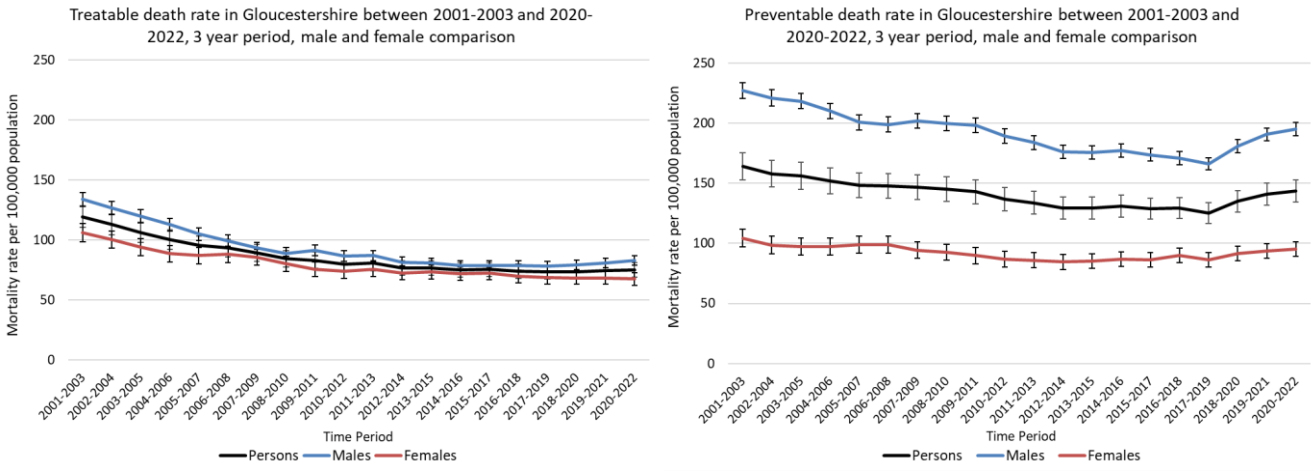

Figure 16: Sex differences for treatable and preventable mortality in Gloucestershire, 2001-2003 to 2020-2022

[15] Office for National Statistics, 2021. https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/articles/coronaviruscovid19andthedifferenteffectsonmenandwomenintheukmarch2020tofebruary2021/2021-03-10

14.0 Appendices

Appendix A: Classifications used to obtain avoidable mortality from mortality data, broken down by treatable and preventable mortality.[16][17]

Condition group and cause	ICD-10 codes	Age	Treatable	Preventable
Infectious diseases				
Intestinal diseases	A00-A09	0-74		•
Diphtheria, Tetanus, Poliomyelitis	A35, A36, A80	0-74		•
Whooping cough	A37	0-74		•
Meningococcal infection	A39	0-74		•
Sepsis due to streptococcus pneumonia and sepsis due to haemophilus influenzae	A40.3, A41.3	0-74		•
Haemophilus influenza infections	A49.2	0-74		•
Sexually transmitted infections (except HIV/AIDS)	A50-A60, A63, A64	0-74		•
Varicella	B01	0-74		•
Measles	B05	0-74		•
Rubella	B06	0-74		•
Viral Hepatitis	B15-B19	0-74		•
HIV/AIDS	B20-B24	0-74		•
Malaria	B50-B54	0-74		•
Haemophilus and pneumococcal meningitis	G00.0, G00.1	0-74		•
Tuberculosis	A15-A19, B90, J65	0-74	• (50%)	• (50%)
Scarlet fever	A38	0-74	•	
Sepsis	A40 (excl. A40.3), A41 (excl. A41.3)	0-74	•	
Cellulitis	A46, L03	0-74	•	
Legionnaires disease	A48.1	0-74	•	
Streptococcal and enterococci infection	A49.1	0-74	•	
Other meningitis	G00.2, G00.3, G00.8, G00.9	0-74	•	
Meningitis due to other and unspecified causes	G03	0-74	•	
Neoplasms				
Lip, oral cavity and pharynx cancer	C00-C14	0-74		•
Oesophageal cancer	C15	0-74		•

[16] Office for National Statistics, 2022. Avoidable mortality in the UK QMI - Office for National Statistics

[17] Where there is a (50%), the number of deaths occurring in this category is split with half of the number of deaths being attributed to treatable mortality and the other half attributed to preventable mortality.

Stomach cancer	C16	0-74		•
Liver cancer	C22	0-74		•
Lung cancer	C33-C34	0-74		•
Mesothelioma	C45	0-74		•
Skin (melanoma) cancer	C43	0-74		•
Bladder cancer	C67	0-74		•
Cervical cancer	C53	0-74	• (50%)	• (50%)
Colorectal cancer	C18-C21	0-74	•	
Breast cancer (female only)	C50	0-74	•	
Uterus cancer	C54, C55	0-74	•	
Testicular cancer	C62	0-74	•	
Thyroid cancer	C73	0-74	•	
Hodgkin's disease	C81	0-74	•	
Lymphoid leukaemia	C91.0, C91.1	0-74	•	
Benign neoplasm	D10-D36	0-74	•	
Endocrine and metabolic diseases				
Nutritional deficiency anaemia	D50-D53	0-74		•
Diabetes mellitus	E10-E14	0-74	• (50%)	• (50%)
Thyroid disorders	E00-E07	0-74	•	
Adrenal disorders	E24-E25 (excl. E24.4), E27	0-74	•	
Diseases of the nervous system				
Epilepsy	G40, G41	0-74	•	
Diseases of the circulatory system				
Aortic aneurysm	I71	0-74	• (50%)	• (50%)
Hypertensive diseases	I10-I13, I15	0-74	• (50%)	• (50%)
Ischaemic heart diseases	I20-I25	0-74	• (50%)	• (50%)
Cerebrovascular diseases	I60-I69	0-74	• (50%)	• (50%)
Other atherosclerosis	I70, I73.9	0-74	• (50%)	• (50%)
Rheumatic and other heart diseases	I00-I09	0-74	•	
Venous thromboembolism	I26, I80, I82.9	0-74	•	
Diseases of the respiratory system				
Influenza	J09-J11	0-74		•
Pneumonia due to streptococcus pneumonia or haemophilus influenza	J13-J14	0-74		•
Chronic lower respiratory diseases	J40-J44	0-74		•
Lung diseases due to external agents	J60-J64, J66-J70, J82, J92	0-74		•
Upper respiratory infections	J00-J06, J30-J39	0-74	•	

Pneumonia, not elsewhere classified or organism unspecified	J12, J15, J16-J18	0-74	•	
Acute lower respiratory infections	J20-J22	0-74	•	
Asthma and bronchiectasis	J45-J47	0-74	•	
Adult respiratory distress syndrome	J80	0-74	•	
Pulmonary oedema	J81	0-74	•	
Abscess of lung and mediastinum pyothorax	J85, J86	0-74	•	
Other pleural disorders	J90, J93, J94	0-74	•	
Diseases of the digestive system				
Gastric and duodenal ulcer	K25-K28	0-74	•	
Appendicitis	K35-K38	0-74	•	
Abdominal hernia	K40-K46	0-74	•	
Cholelithiasis and cholecystitis	K80-K81	0-74	•	
Other diseases of gallbladder or biliary tract	K82-K83	0-74	•	
Acute pancreatitis	K85.0, K85.1, K85.3, K85.8, K85.9	0-74	•	
Other diseases of pancreas	K86.1, K86.2, K86.3, K86.8, K86.9	0-74	•	
Diseases of the genitourinary system				
Nephritis and nephrosis	N00-N07	0-74	•	
Obstructive uropathy	N13, N20-N21, N35	0-74	•	
Renal failure	N17-N19	0-74	•	
Renal colic	N23	0-74	•	
Disorders resulting from renal tubular dysfunction	N25	0-74	•	
Unspecified contracted kidney, small kidney of unknown cause	N26-N27	0-74	•	
Inflammatory diseases of genitourinary system	N34.1, N70-N73, N75.0, N75.1, N76.4, N76.6	0-74	•	
Prostatic hyperplasia	N40	0-74	•	
Pregnancy, childbirth and the perinatal period				
Tetanus neonatorum	A33	0-74		•
Obstetrical tetanus	A34	0-74		•
Pregnancy, childbirth and the puerperium	O00-O99	0-74	•	
Certain conditions originating in the perinatal period	P00-P96	0-74	•	

Congenital malformations				
Certain congenital malformations (neural tube defects)	Q00, Q01, Q05	0-74		•
Congenital malformations of the circulatory system (heart defects)	Q20-Q28	0-74	•	
Adverse effects of medical and surgical care				
Drugs, medicaments and biological substances causing adverse effects in therapeutic use	Y40-Y59	0-74	•	
Misadventures to patients during surgical and medical care	Y60-Y69, Y83-Y84	0-74	•	
Medical devices associated with adverse incidents in diagnostic and therapeutic use	Y70–Y82	0-74	•	
Injuries				
Transport Accidents	V01-V99	0-74		•
Accidental Injuries	W00-X39, X46-X59	0-74		•
Intentional self-harm	X66-X84	0-74		•
Event of undetermined intent	Y16-Y34	0-74		•
Assault	X86-Y09, U50.9	0-74		•
Alcohol-related and drug-related deaths				
Alcohol-specific disorders and poisonings	E24.4, F10, G31.2, G62.1, G72.1, I42.6, K29.2, K70, K85.2, K86.0, Q86.0, R78.0, X45, X65, Y15	0-74		•
Other alcohol-related disorders	K73, K74.0-K74.2, K74.6	0-74		•
Drug disorders and poisonings	F11-F16, F18-F19, X40-X44, X85, Y10-Y14	0-74		•
Intentional self-poisoning by drugs	X60-X64	0-74		•
Provisional assignment of new diseases				
COVID-19	U07.1-U07.2	0-74		•