Office for National Statistics

Statistical bulletin

Monthly mortality analysis, England and Wales: September 2022

Provisional death registration data for England and Wales, broken down by sex, age and country. Includes deaths due to coronavirus (COVID-19) and leading causes of death.

Contact:
Health Statistics and Research
health.data@ons.gov.uk
+44 1329 444110

Release date:
21 October 2022

Next release:
23 November 2022

Table of contents

1 . Main points

- In September 2022, there were 42,614 deaths registered in England, 4,236 deaths (11.0%) above the September five-year average (2016 to 2019, and 2021); there were 2,779 deaths registered in Wales, 234 deaths (9.2%) above the September average.

- The leading cause of death in both England and Wales in September 2022 was dementia and Alzheimer's disease (11.4% of all deaths in England and 10.5% of all deaths in Wales).

- Coronavirus (COVID-19) was the 12th leading cause of death in September 2022 in England (accounting for 1.8% of all deaths) and the 10th leading cause of death in Wales (2.1% of all deaths).

- Accounting for the population size and age structure, the age-standardised mortality rate (ASMR) for deaths due to COVID-19 decreased significantly between August and September 2022 in England (from 30.5 to 16.7 deaths per 100,000 people); the ASMR also decreased in Wales (from 29.6 to 19.9 deaths per 100,000 people), but this was not significant.

- The year-to-date (January to September) ASMR in 2022 in both England (936.9 deaths per 100,000 people) and Wales (1,011.1 deaths per 100,000 people) was significantly lower than most years since our data time series began in 2001.

- In Quarter 3 (July to Sept) 2022, symptoms, signs and ill-defined conditions (which includes "old age" and "frailty") remained the most common pre-existing condition mentioned on death certificates for deaths due to COVID-19 in England and Wales (26.7% of all deaths due to COVID-19).

2 . Death registrations and the overall mortality rate for September 2022

There were 42,614 deaths registered in England in September 2022, based on provisional data. This was 1,854 fewer deaths than in September 2021 and 4,236 more deaths (11.0%) than the five-year average (2016 to 2019, and 2021). Compared with the previous five-year average (2015 to 2019), there were 5,355 more deaths (14.4%) in September 2022 in England.

In Wales, the provisional number of deaths registered in September 2022 was 2,779. This was 185 fewer deaths than in September 2021 and 234 more deaths (9.2%) than the five-year average (2016 to 2019, and 2021) for September. Compared with the previous five-year average (2015 to 2019), there were 304 more deaths (12.3%) in September 2022 in Wales.

The five-year average for 2022 has been provided for 2016 to 2019, and 2021. This moves our five-year average along by a year but does not include the exceptionally high number of deaths seen in 2020. This is so that deaths in 2022 are compared with a five-year average that is up to date (rather than 2015 to 2019) while still being close to representing a usual (non-coronavirus (COVID-19) pandemic) year. For more information, see Section 6: Calculating excess deaths.

Age-standardised mortality rates (ASMRs) are used for comparisons over time rather than numbers of deaths, because ASMRs account for changes to the population size and age structure.

In England, the highest mortality rate for the month of September within our data time series was in 2003 (1,157.1 deaths per 100,000 people). This was statistically significantly higher than the September ASMR in all other years since the start of the data time series.

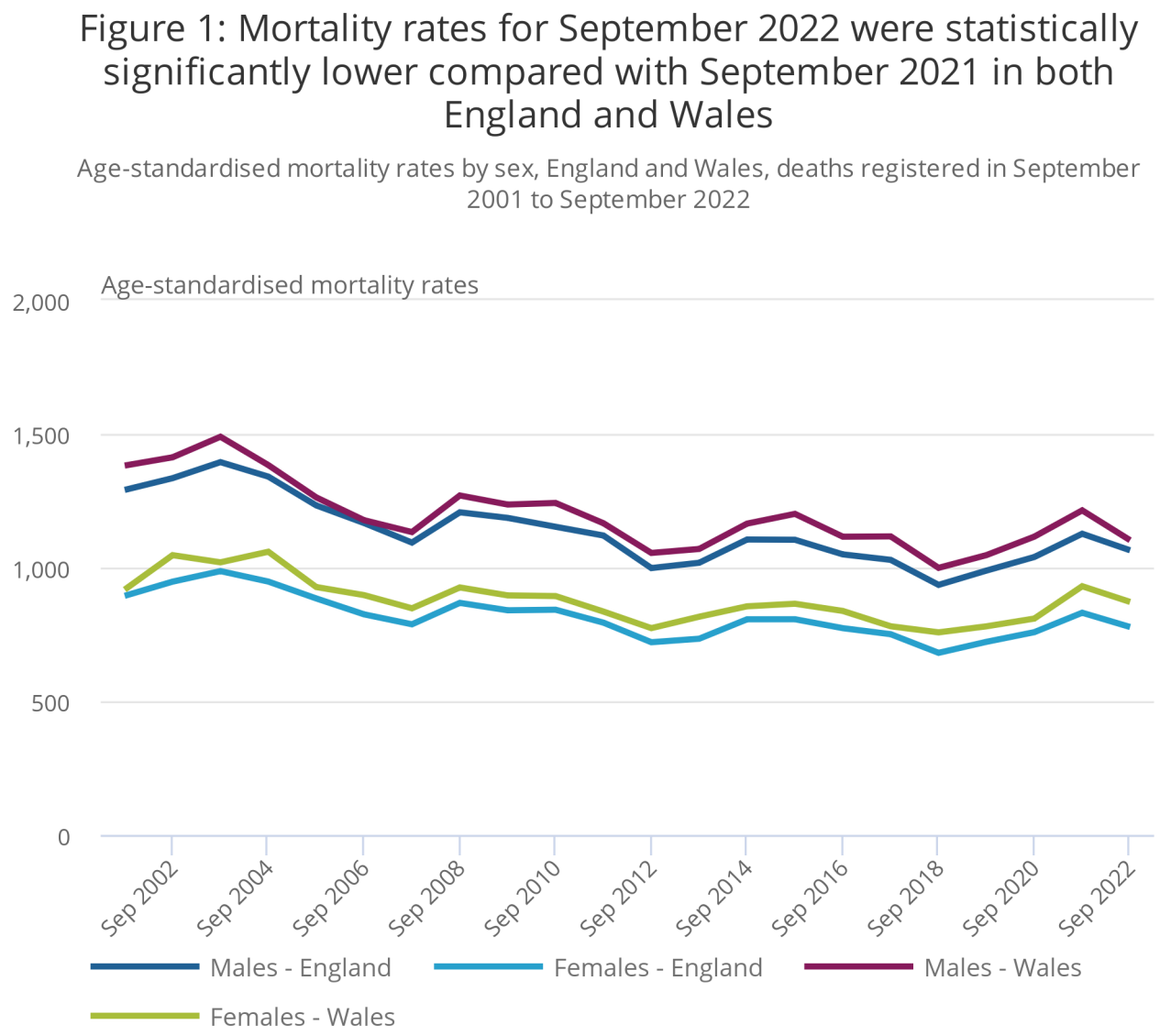
Following this, overall mortality rates generally decreased to a low of 794.0 deaths per 100,000 people in September 2018, which was significantly lower than the September ASMR for all other years in our time series.

The September ASMR significantly increased in each of the following three years to 966.0 deaths per 100,000 deaths in September 2021 before significantly decreasing to 907.1 deaths per 100,000 people in September 2022. This pattern was similar in both males and females (Figure 1).

In Wales, mortality rates for September have generally decreased over time; from a high of 1,213.2 deaths per 100,000 people in September 2003, to 867.6 deaths per 100,000 people in September 2018; this was the lowest ASMR since the start of the data time series in 2001. The ASMR significantly increased to 1,056.4 deaths per 100,000 people in September 2021, and then significantly decreased in September 2022 to 975.0 deaths per 100,000 people. This pattern in ASMRs over time was similar in both males and females (Figure 1).

Figure 1: Mortality rates for September 2022 were statistically significantly lower compared with September 2021 in both England and Wales

Age-standardised mortality rates by sex, England and Wales, deaths registered in September 2001 to September 2022



Source: Office for National Statistics – Monthly mortality analysis

Notes:

1. Age-standardised mortality rates per 100,000 people, standardised to the 2013 European Standard Population. Monthly rates in this bulletin are adjusted to allow for comparisons with annual rates. For more information, see the Measuring the data section.
2. Figures are for deaths registered rather than deaths occurring in each period.
3. Figures for 2022 are based on provisional mortality data and projected populations.
4. Figures exclude non-residents.

3 . Deaths due to COVID-19 registered in September 2022

The doctor certifying a death can list all causes in the chain of events that led to the death, and pre-existing conditions that may have contributed to the death. Using this information, we determine an underlying cause of death. More information on this process can be found in our User guide to mortality statistics.

In this bulletin, we use the term "due to COVID-19" when referring only to deaths with an underlying cause of death of COVID-19. We use the term "involving COVID-19" when referring to deaths that had COVID-19 mentioned anywhere on the death certificate, whether as an underlying cause or not.

The first deaths involving coronavirus (COVID-19) were registered in England and Wales in March 2020. Since then, COVID-19 was the underlying cause of death in most deaths that involved COVID-19 (85.2% in England, 83.9% in Wales).

The proportion of deaths due to COVID-19 (of all deaths involving COVID-19) decreased between August and September 2022 in England (from 62.4% to 61.4%) and increased in Wales (from 60.4% to 68.7%) (Figure 2).

For more information on our definition of COVID-19 deaths, see Section 11: Measuring the data.

Figure 2: The proportion of deaths due to COVID-19, when COVID-19 was mentioned anywhere on the death certificate, decreased in England and increased in Wales in September 2022 compared with August 2022

Percentage of deaths involving COVID-19 that were due to COVID-19, England and Wales, deaths registered in March 2020 to September 2022

Notes:

1. Figures are for deaths registered rather than deaths occurring in each period.
2. Figures for 2022 are based on provisional mortality data and projected populations.
3. Figures exclude non-residents.
4. Deaths "due to COVID-19" include only deaths where COVID-19 was the underlying cause of death, whereas deaths “involving COVID-19” include deaths where COVID-19 was mentioned anywhere on the death certificate. For more information on our definitions of COVID-19 deaths, see the Measuring the data section.
5. Because of small numbers, the proportions for May 2021 and June 2021 in Wales should be interpreted with caution.

Download the data

.xlsx

Of the 42,614 deaths registered in September 2022 in England, 1.8% (781 deaths) were due to COVID-19, this was almost half the number of deaths registered in August 2022 that were due to COVID-19 (1,478 deaths, 3.3% of all deaths). Including all deaths involving COVID-19 (1,272 deaths), this percentage increased to 3.0% of all deaths in England.

In Wales, 2.1% of the 2,779 deaths registered in September 2022 were due to COVID-19 (57 deaths), this was almost half the number of deaths registered in August 2022 that were due to COVID-19 (87 deaths, 3.0%). Including all deaths involving COVID-19 (83 deaths), this percentage increased to 3.0% of all deaths in Wales in September 2022.

Mortality rates for deaths due to COVID-19

When adjusting for the size and age structure of the population, age-standardised mortality rates (ASMRs) for deaths due to COVID-19 in England and Wales for September 2022 showed decreases compared with August 2022, but these were not statistically significant in Wales (Figure 3).

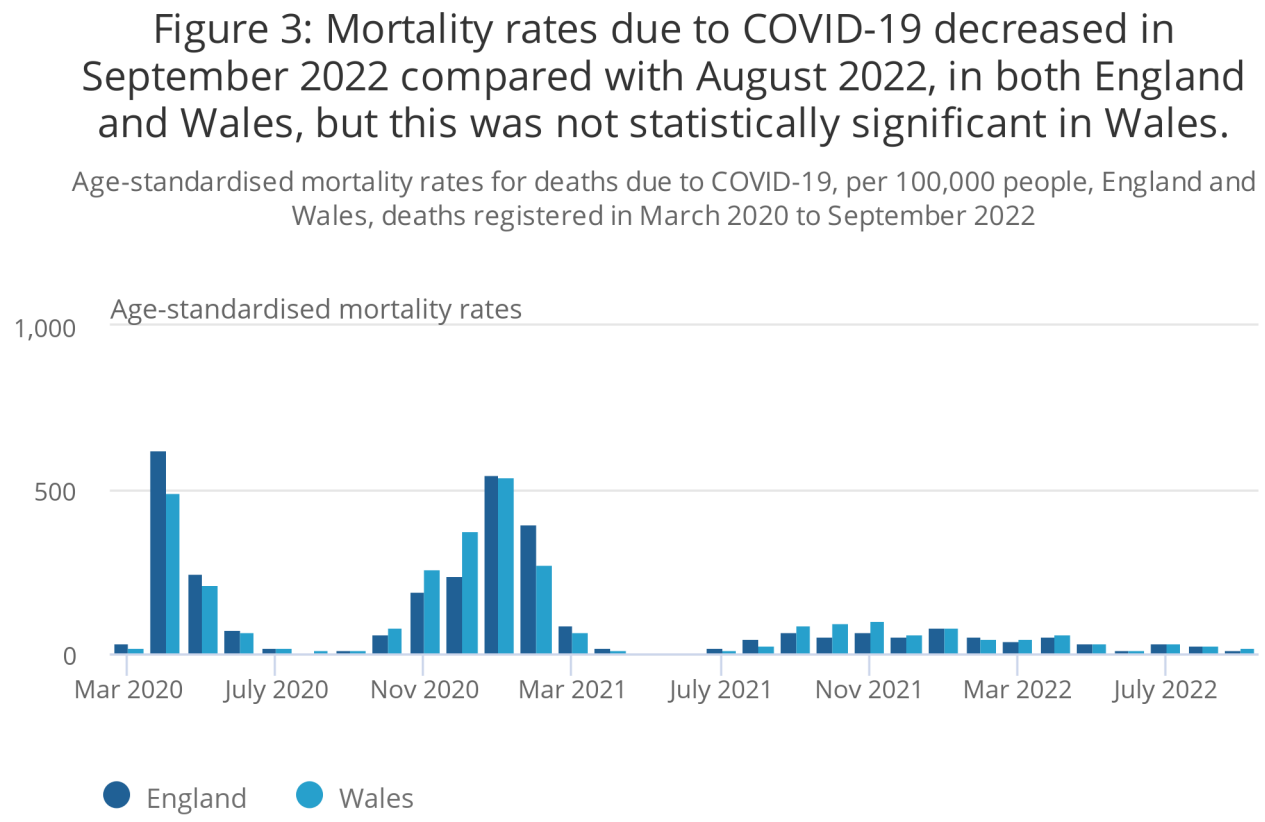
The ASMR for deaths due to COVID-19 in England decreased to 16.7 deaths per 100,000 people in September 2022, from 30.5 deaths per 100,000 people in August 2022.

In Wales, the ASMR also decreased, to 19.9 deaths per 100,000 people in September 2022 compared with 29.6 deaths per 100,000 people in August 2022.

These patterns in ASMRs were similar for males and females in England and in Wales.

Figure 3: Mortality rates due to COVID-19 decreased in September 2022 compared with August 2022, in both England and Wales, but this was not statistically significant in Wales.

Age-standardised mortality rates for deaths due to COVID-19, per 100,000 people, England and Wales, deaths registered in March 2020 to September 2022



Source: Office for National Statistics – Monthly mortality analysis

Notes:

1. Age-standardised mortality rates per 100,000 people, standardised to the 2013 European Standard Population. Monthly rates in this bulletin are adjusted to allow for comparisons with annual rates. For more information, see the Measuring the data section.

2. Figures for 2022 are based on provisional mortality data and projected populations.

3. Figures exclude non-residents of England and Wales.

4. Deaths "due to COVID-19" include only deaths where COVID-19 was the underlying cause of death, whereas deaths "involving COVID-19" include deaths where COVID-19 was mentioned anywhere on the death certificate. For more information on our definitions of COVID-19 deaths, see the Measuring the data section

5. Because of small numbers, the rate for May 2021 in Wales is unreliable (19 deaths) so should be interpreted with caution, and the rate for June 2021 (3 deaths) has not been calculated and is denoted as [x] in the data downloads.

More information on mortality rates by sex is available in Tables 3a and 3b of our accompanying dataset.

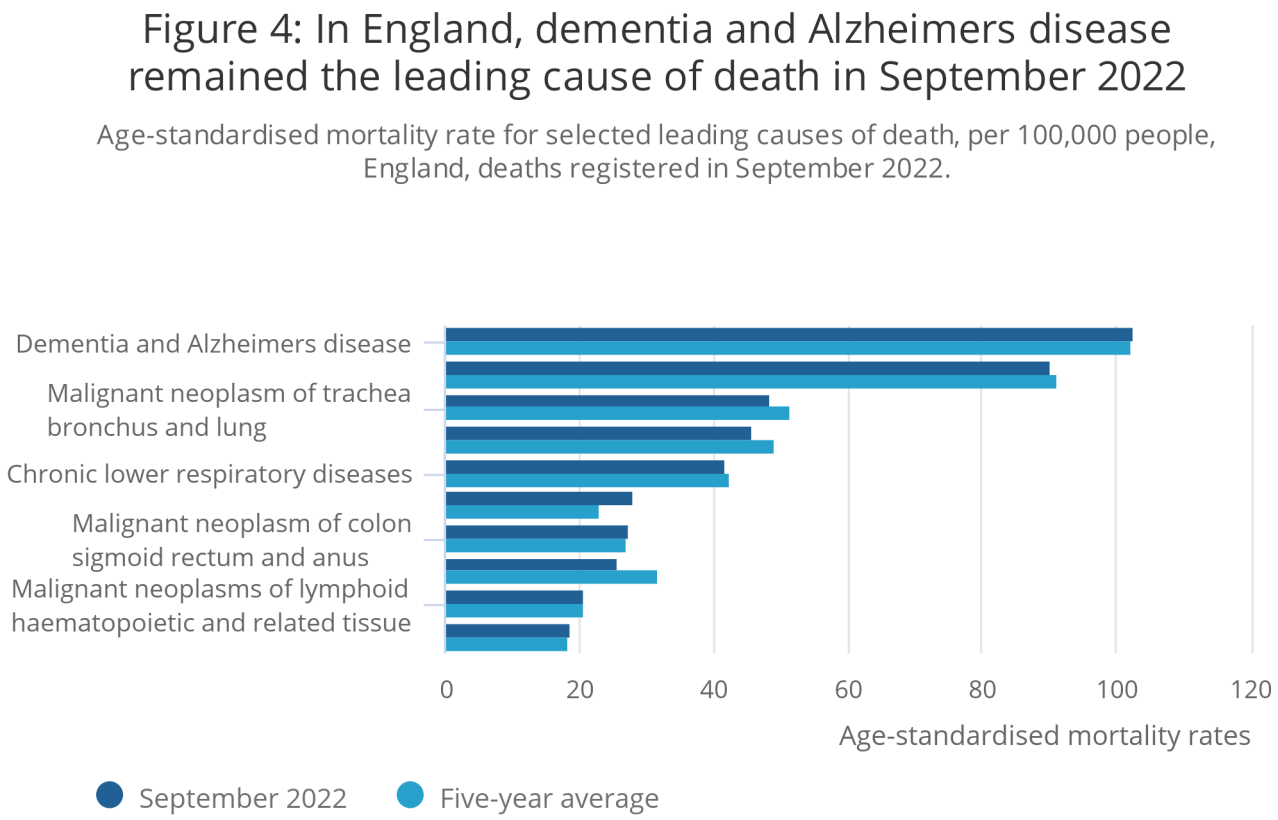
More about coronavirus
- Find the latest on coronavirus (COVID-19) in the UK.
- Explore the latest coronavirus data from the ONS and other sources.
- View all coronavirus data.

4 . Leading causes of death

The 10 most common underlying causes of death registered in September 2022, compared with the five-year average for September (2016 to 2019, and 2021), for England and Wales, respectively, are shown in Figures 4 and 5. Causes of death are based on our leading causes of death groupings.

Figure 4: In England, dementia and Alzheimers disease remained the leading cause of death in September 2022

Age-standardised mortality rate for selected leading causes of death, per 100,000 people, England, deaths registered in September 2022.



Source: Office for National Statistics – Monthly mortality analysis

Notes:

1. Age-standardised mortality rates per 100,000 population, standardised to the 2013 European Standard Population. Monthly rates in this bulletin are adjusted to allow for comparisons with annual rates. For more information, see the Measuring the data section.

2. Figures for 2022 are based on provisional mortality data and projected populations.

3. Based on underlying cause of death.

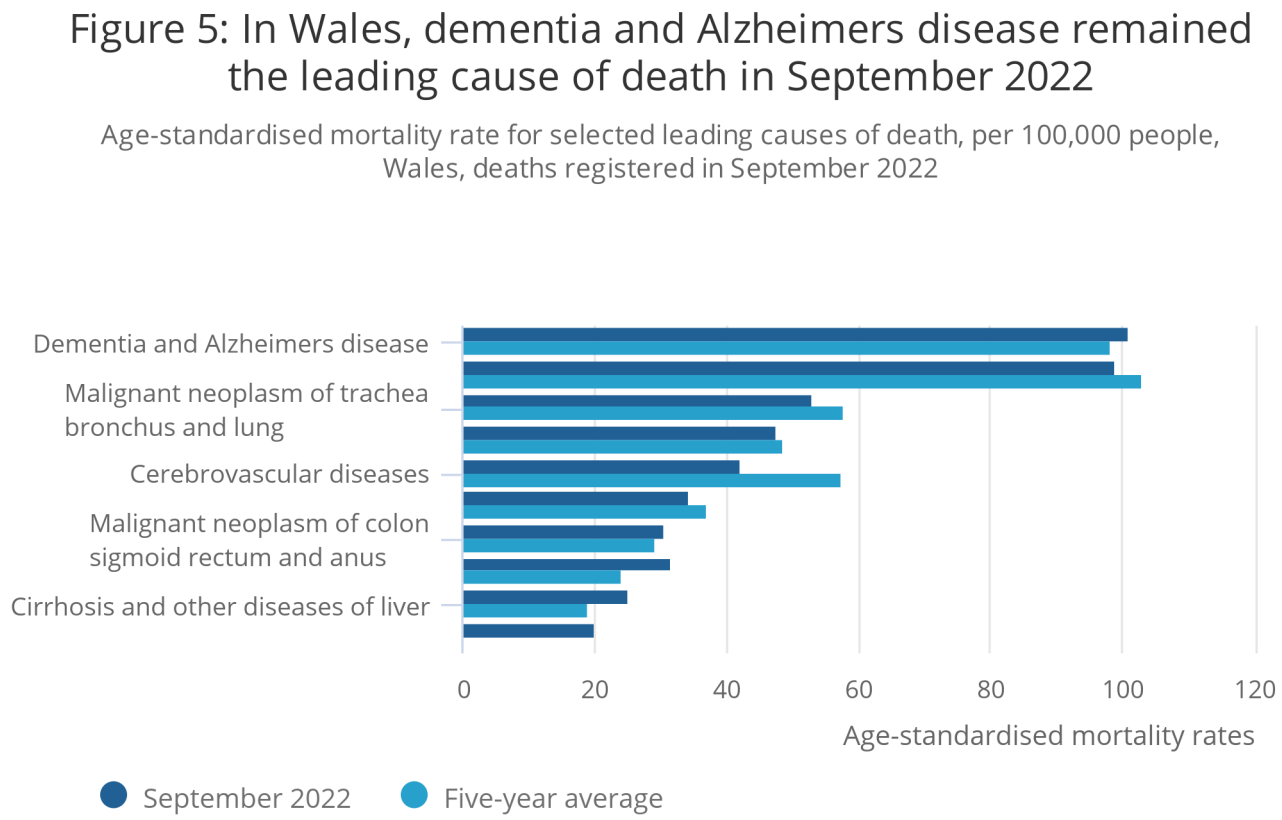
4. Figures exclude deaths of non-residents.

5. The five-year average has been provided for 2016 to 2019 and 2021 because of the impact of the coronavirus pandemic on deaths registered in 2020. This provides an up to date (rather than 2015 to 2019) comparison of the number of deaths expected per month in a usual (non-coronavirus pandemic) year. Where a five-year average cannot be provided, it is denoted as "[z]" in the data downloads.

6. Leading causes are ranked based on number of deaths, not age-standardised mortality rates.

Figure 5: In Wales, dementia and Alzheimers disease remained the leading cause of death in September 2022

Age-standardised mortality rate for selected leading causes of death, per 100,000 people, Wales, deaths registered in September 2022



Source: Office for National Statistics – Monthly mortality analysis

Notes:

1. Age-standardised mortality rates per 100,000 population, standardised to the 2013 European Standard Population. Monthly rates in this bulletin are adjusted to allow for comparisons with annual rates. For more information, see the Measuring the data section.

2. Figures for 2022 are based on provisional mortality data and projected populations.

3. Based on underlying cause of death.

4. Figures exclude deaths of non-residents.

5. The five-year average has been provided for 2016 to 2019 and 2021 because of the impact of the coronavirus pandemic on deaths registered in 2020. This provides an up-to-date comparison (rather than 2015 to 2019) of the number of deaths expected per month in a usual (non-coronavirus pandemic) year. Where a five-year average cannot be provided, it is denoted as "[z]" in the data downloads.

6. Leading causes are ranked based on number of deaths, not age-standardised mortality rates.

In England, dementia and Alzheimer's disease remained the leading cause of death in September 2022 (for the 15th consecutive month), with 102.7 deaths per 100,000 people (4,879 deaths).

In Wales, the leading cause of death was also dementia and Alzheimer's disease (for the second consecutive month), with 100.9 deaths per 100,000 people (291 deaths).

In England, coronavirus (COVID-19) was the 12th leading cause of death in September 2022 (781 deaths), decreasing from sixth leading cause in August 2022. This was significantly lower than the top nine leading causes of death. For the number of deaths per leading cause of death up until COVID-19 in England in September 2022, see our related dataset.

In Wales, COVID-19 was the 10th leading cause of death in September 2022 (57 deaths), decreasing from the joint-seventh leading cause in August 2022.

In England in September 2022, 2 of the 10 leading causes of death were significantly lower than the five-year average, and 7 of the 10 leading causes were not statistically significantly different than the five-year average. The mortality rate for symptoms, signs, and ill-defined conditions was statistically significantly higher (22.1% higher) than the five-year average in England, for the 15th consecutive month. This leading cause group includes mostly deaths with a code for "old age" but is also used for causes such as "frailty".

In Wales in September 2022, 9 out of the 10 leading causes of death were not significantly different than the five-year average. The mortality rate for cerebrovascular diseases was significantly lower (26.9% lower) than the five-year average.

Leading causes of death registered in the year-to-date

In the first nine months (January to September) of 2022, the leading cause of death in England was dementia and Alzheimer's disease (105.3 deaths per 100,000 people). In Wales, the year-to-date leading cause of death was ischaemic heart diseases (111.0 deaths per 100,000 people).

In England, the year-to-date COVID-19 mortality rate remained the sixth leading cause of death (40.2 deaths per 100,000 people). This was statistically significantly lower than the top five leading causes of death, and significantly higher than all causes ranked lower.

In Wales, deaths due to COVID-19 remained the sixth leading cause of death in the year-to-date (41.0 deaths per 100,000 people). This was significantly lower than the top five leading causes of death, and significantly higher than all leading causes ranked lower, apart from influenza and pneumonia, which was the seventh leading cause of death in the year-to-date (36.3 deaths per 100,000 people).

More information on the 2022 year-to-date leading causes of death is available in Tables 11a and 11b of our accompanying dataset. More in-depth analysis of leading causes of death is available in our annual publication, based on finalised mortality data.

5 . Deaths registered in the year-to-date

There were 398,041 deaths registered in England and 26,172 in Wales during the first nine months (January to September) of 2022.

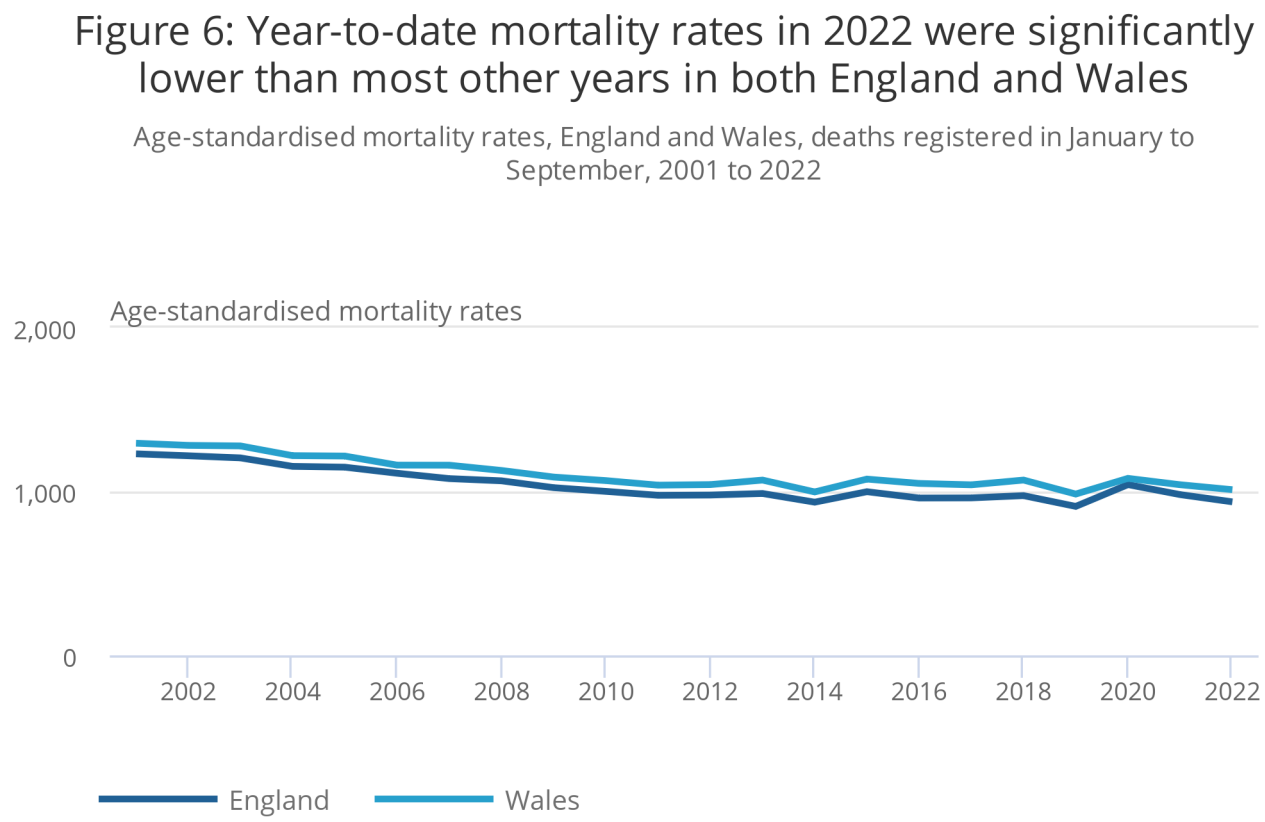
To gain a better idea of year-to-year differences in mortality rates, we calculated year-to-date age-standardised mortality rates (ASMRs) based on deaths registered in January to September of each year from 2001 to 2022 (Figure 6).

For England, the year-to-date ASMR for 2022 (936.9 deaths per 100,000 people) was statistically significantly lower than most years since our data time series started in 2001. This is except for 2019 (909.1 deaths per 100,000 people), which was significantly lower than 2022, and 2014 (934.9 deaths per 100,000 people), which was not significantly different.

For Wales, the year-to-date ASMR for 2022 was 1,011.1 deaths per 100,000 people. This was statistically significantly lower than most years since our data time series began, except for 2019 which was significantly lower than 2022 (984.4 deaths per 100,000) and 2014 (997.4 deaths per 100,000 people), which was not significantly different to 2022.

Figure 6: Year-to-date mortality rates in 2022 were significantly lower than most other years in both England and Wales

Age-standardised mortality rates, England and Wales, deaths registered in January to September, 2001 to 2022



Source: Office for National Statistics – Monthly mortality analysis

Notes:

1. Age-standardised mortality rates per 100,000 people, standardised to the 2013 European Standard Population. Monthly rates in this bulletin are adjusted to allow for comparisons with annual rates. For more information, see the Measuring the data section.
2. Figures are for deaths registered rather than deaths occurring in each period.
3. Figures for 2022 are based on provisional mortality data and projected populations.
4. Figures exclude non-residents.

6 . Calculating excess deaths

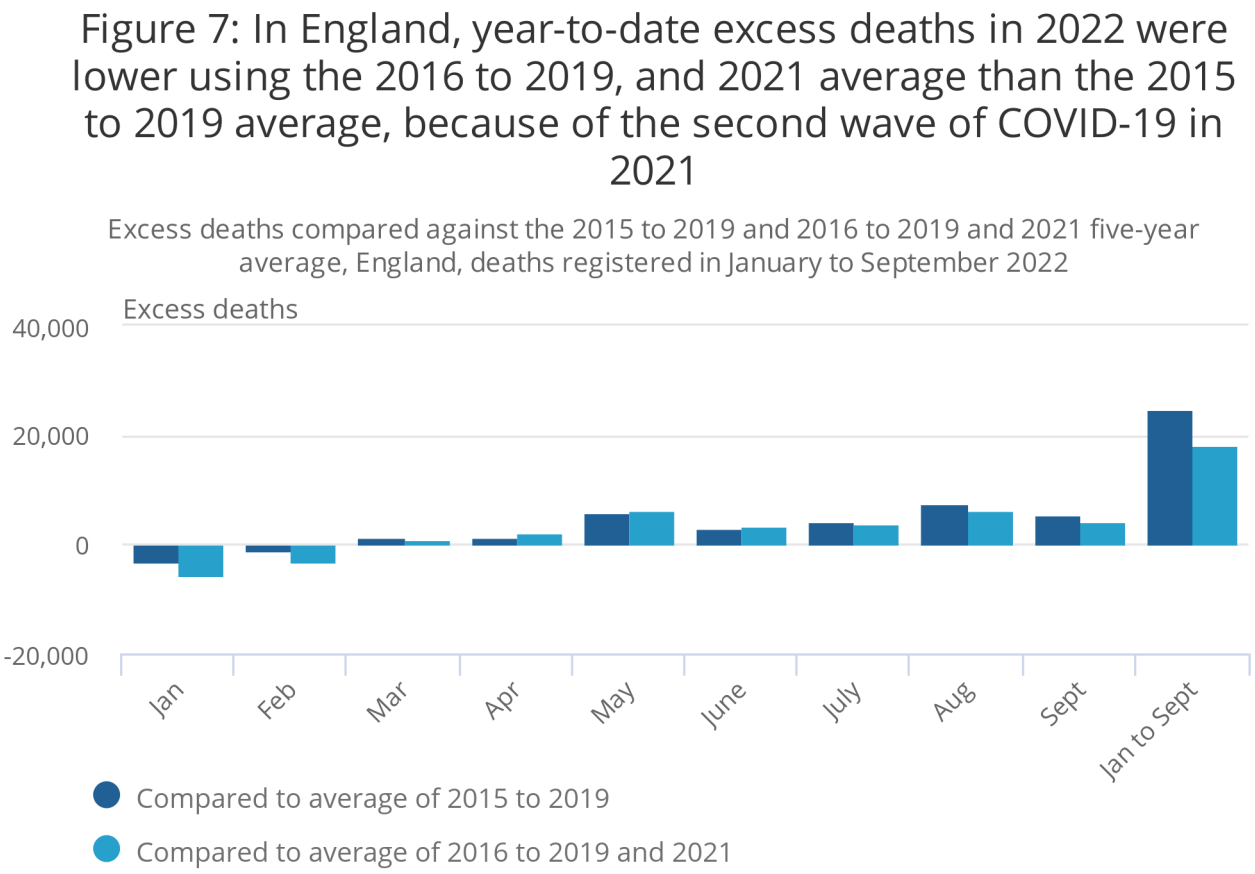
This section analyses excess deaths, which is the difference between the observed deaths within a period compared with the five-year average for the same period. Comparisons in this section are made against both the five-year average for 2022 (2016 to 2019, and 2021) and the pre-coronavirus (COVID-19) pandemic five-year average (2015 to 2019). For more information on excess deaths, and keeping our five-year average robust during the pandemic, see our July 2022 edition of this release.

In September 2022, when considering the 2016 to 2019, and 2021 five-year average, excess deaths in England were 4,236 above what we would expect in a "normal" year (Figure 7). This is compared with 5,355 when using the 2015 to 2019 average. The year-to-date (January to September) excess in England, when using the 2016 to 2019, and 2021 five-year average, was 18,134 above what we would expect. This increases to 24,902 deaths above what we would expect when the 2015 to 2019 average is used.

While the number of year-to-date deaths are above average, it is important to note that these do not take into account age structure or population size. When we take these into account, 2022 year-to-date deaths are generally lower than all other years since 2001, see Section 5: Deaths registered in the year-to-date.

Figure 7: In England, year-to-date excess deaths in 2022 were lower using the 2016 to 2019, and 2021 average than the 2015 to 2019 average, because of the second wave of COVID-19 in 2021

Excess deaths compared against the 2015 to 2019 and 2016 to 2019 and 2021 five-year average, England, deaths registered in January to September 2022



Source: Office for National Statistics – Monthly mortality analysis

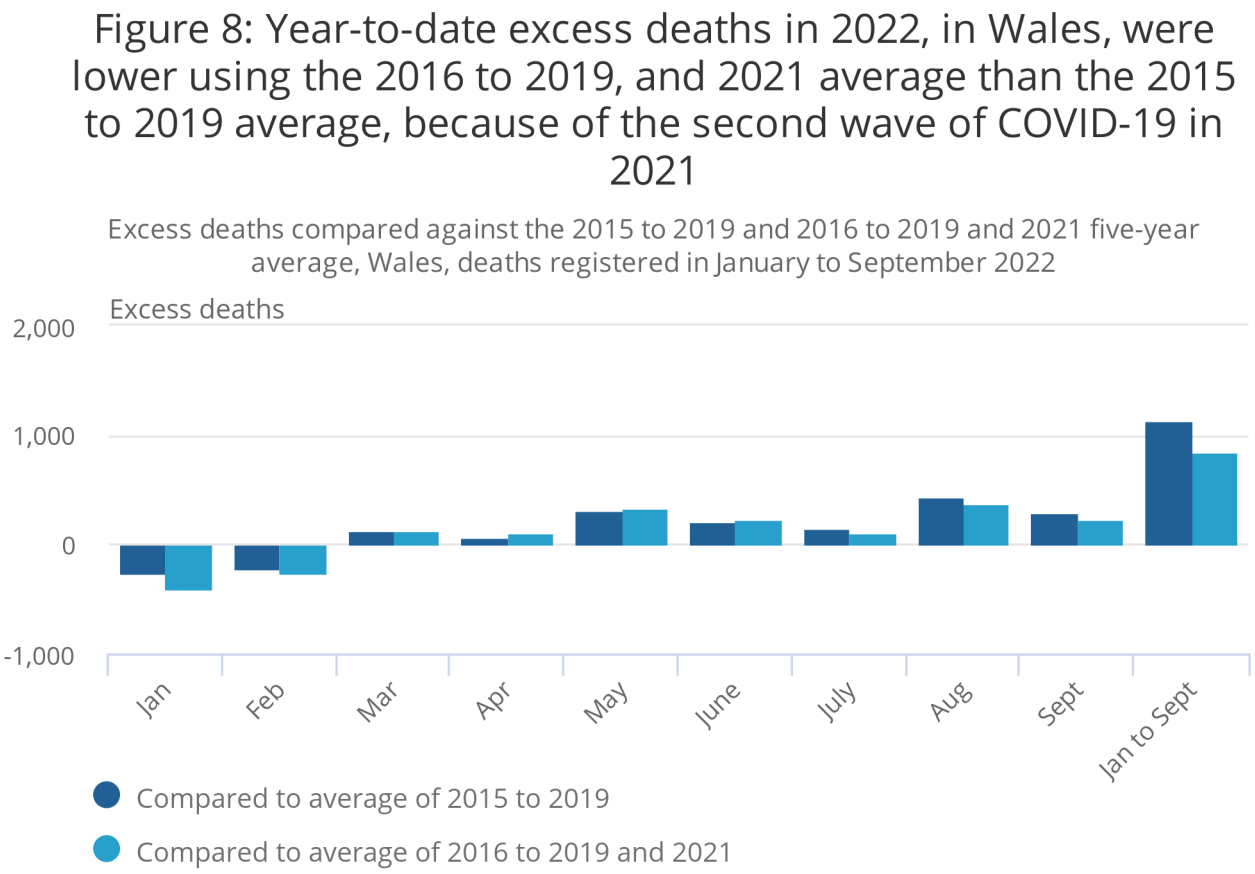
Notes:

1. Figures are for deaths registered rather than deaths occurring in each period.
2. Figures for 2022 are based on provisional mortality data.
3. Figures exclude non-residents.
4. The 2016 to 2019 and 2021 five-year average provides an up-to-date comparison (rather than 2015 to 2019) of the number of deaths expected per month in a usual (non-coronavirus pandemic) year.
5. The individual months figures are not refreshed each month and therefore may not sum to the year-to-date figure, which is updated every month.

In Wales in September 2022, there were 234 deaths above what we would expect in a "normal" year, when considering the 2016 to 2019, and 2021 five-year average (Figure 8). This increases to 304 excess deaths when the 2015 to 2019 five-year average is used. The year-to-date excess in Wales, when using the 2016 to 2019, and 2021 five-year average, was 859 deaths above what we would expect. This is compared with 1,139 deaths above when using the 2015 to 2019 average.

Figure 8: Year-to-date excess deaths in 2022, in Wales, were lower using the 2016 to 2019, and 2021 average than the 2015 to 2019 average, because of the second wave of COVID-19 in 2021

Excess deaths compared against the 2015 to 2019 and 2016 to 2019 and 2021 five-year average, Wales, deaths registered in January to September 2022



Source: Office for National Statistics – Monthly mortality analysis

Notes:

1. Figures are for deaths registered rather than deaths occurring in each period.
2. Figures for 2022 are based on provisional mortality data.
3. Figures exclude non-residents.
4. The 2016 to 2019 and 2021 five-year average provides an up-to-date comparison (rather than 2015 to 2019) of the number of deaths expected per month in a usual (non-pandemic) year.
5. The individual months figures are not refreshed each month and therefore may not sum to the year-to-date figure, which is updated every month.

7 . Death occurrences in September 2022 and year-to-date

This section is based on the date a death occurred, rather than the date of registration used in the previous sections, to monitor current mortality trends. Further information can be found in Section 11: Measuring the data.

In England, 35,131 deaths occurred in September 2022 (and were registered by 7 October 2022). This was 3,034 fewer deaths than the five-year average (2016 to 2019, and 2021) for September (7.9% lower). In September 2022, of all deaths that occurred, 605 deaths (1.7%) were due to coronavirus (COVID-19).

In Wales, 2,399 deaths occurred in September 2022 (and were registered by 7 October 2022). This was 162 fewer deaths than the five-year average (6.3% lower). Of all deaths that occurred in September 2022, 45 deaths (1.9%) were due to COVID-19.

The first death due to COVID-19 occurred on 30 January 2020 in England and 15 March 2020 in Wales. Figures 9 and 10 show the trends in COVID-19 death occurrences from March 2020 onwards for England and Wales, respectively.

Figure 9: In England, the number of daily deaths due to COVID-19 decreased in September 2022

Number of deaths occurring on each day from March 2020 to September 2022, five-year average and range, England

Notes:

1. Figures are for deaths occurring on each day rather than deaths registered, registered up to 7 October 2022. Death occurrences will increase as more deaths are registered, particularly for later dates.

2. Figures for 2022 (including deaths that occurred in previous years but were registered in 2022) are based on provisional mortality data.

3. Figures exclude non-residents.

4. "COVID-19" includes only deaths where COVID-19 was the underlying cause.

5. This chart includes deaths from 1 March 2020. Three deaths due to COVID-19 occurred prior to this in England (one death in January 2020 and two deaths in February 2020), but are not included here.

6. For deaths occurring in 2020 and 2021, the five-year average consists of deaths occurring between 2015 to 2019, whereas for deaths occurring in 2022 the five-year average consists of deaths occurring between 2016 to 2019 and 2021.

7. The five-year average for 2022 has been provided for 2016 to 2019 and 2021, because of the impact of the coronavirus pandemic on deaths occurring in 2020. This provides an up-to-date comparison (rather than 2015 to 2019) of the number of deaths expected per day in a usual (non-coronavirus pandemic) year.

Download the data

.xlsx

Figure 10: In Wales, the number of daily deaths due to COVID-19 decreased in September 2022

Number of deaths occurring on each day from March 2020 to September 2022, five-year average and range, Wales

Notes:

1. Figures are for deaths occurring on each day rather than deaths registered, registered up to 7 October 2022. Death occurrences will increase as more deaths are registered, particularly for later dates.

2. Figures for 2022 (including deaths that occurred in previous years but were registered in 2022) are based on provisional mortality data.

3. Figures exclude non-residents.

4. “COVID-19 deaths” include only deaths where COVID-19 was the underlying cause.

5. For deaths occurring in 2020 and 2021 the five-year average consists of deaths occurring between 2015 to 2019, whereas for deaths occurring in 2022 the five-year average consists of deaths occurring between 2016 to 2019 and 2021.

6. The five-year average for 2022 has been provided for 2016 to 2019 and 2021, because of the impact of the coronavirus pandemic on deaths occurring in 2020. This provides an up-to-date comparison (rather than 2015 to 2019) of the number of deaths expected per day in a usual (non-coronavirus pandemic) year.

Download the data

.xlsx

It is important to note that the number of death occurrences is incomplete because it is likely that more deaths need to be registered. Therefore, comparisons should be treated with caution.

In particular, instances where the number of death occurrences on each day in August was below the range of the last five years are likely to be a result of when the data extract was created. Specifically, deaths that occurred towards the end of the month may not have been registered by the time the data extract was created. We would therefore expect the number of death occurrences to be higher in future releases.

8 . Pre-existing conditions of people whose death was due to COVID-19, deaths registered in July to September 2022

In this section, we use the multiple health conditions that can be recorded on a death certificate to identify deaths where there were pre-existing health conditions that contributed to the cause of death where death was due to coronavirus (COVID-19). Health conditions are recorded on the death certificate only if the certifying doctor or coroner believed they made some contribution to the death, directly or indirectly. The death certificate does not include all health conditions from which the deceased might have suffered if they were not considered relevant. However, the fact that a pre-existing condition was recorded does not suggest that the deceased was likely to have died from that condition in the absence of the COVID-19 infection.

This section analyses data from Quarter 3 (July to Sept) 2022, whereas the rest of the bulletin focuses on the month of September 2022.

This analysis of pre-existing conditions covers England and Wales as a whole. This is because of the small number of deaths due to COVID-19 in Wales in Quarter 3 (253 deaths). We will continue to monitor this and provide analysis if the number of deaths in Wales increases.

When comparing pre-existing conditions for COVID-19 deaths in Quarter 3 with Quarter 2 (Apr to June), the top 20 most common pre-existing conditions remained consistent, but varied in ranking. Symptoms, signs, and ill-defined conditions, which includes "old age" and "frailty", remained the most common pre-existing condition mentioned in Quarter 3 (26.7%), followed by chronic lower respiratory diseases as the second most common at 16.0%.

In addition, the proportion of COVID-19 deaths for each age group in Quarter 3 have remained similar to the proportions as seen in Quarter 2. Among those aged 0 to 64 years, the proportion of deaths due to COVID-19 increased slightly (8.3% in Quarter 3 compared with 7.6% in Quarter 2), whereas the proportion among those aged 65 years decreased slightly (91.7% in Quarter 3 compared with 92.4% in Quarter 2).

Overall, the proportion of COVID-19 deaths with no pre-existing conditions increased slightly from 12.1% in Quarter 2 to 12.8% in Quarter 3. However, the average number of different pre-existing conditions per COVID-19 death remained at 2.0 in Quarter 3, consistent with Quarters 1 and 2.

In Quarter 3, symptoms, signs, and ill-defined conditions remained the most common pre-existing condition for deaths due to COVID-19 occurring in hospitals (28.4%, an increase from 27.4% in Quarter 2). Dementia and Alzheimer's disease remained the most common pre-existing condition for deaths occurring in care homes (32.9%, a decrease from 40.8% in Quarter 2).

Symptoms, signs and ill-defined conditions was the most common pre-existing condition of COVID-19 deaths occurring in private homes, with the proportion increasing from 11.2% in Quarter 2 to 16.0% in Quarter 3.

For further analysis of pre-existing conditions of people whose deaths were due to COVID-19 in Quarter 3 2022 for England and Wales, see our accompanying dataset.

9 . Monthly mortality data

Monthly mortality analysis, England and Wales
Dataset | Released 21 October 2022
Provisional data on death registrations and death occurrences in England and Wales, broken down by sex and age. Includes deaths due to coronavirus (COVID-19) by date of death occurrence, and comparisons of COVID-19 with the leading causes of death.

Deaths due to COVID-19 by English region and Welsh health board
Dataset | Released 21 October 2022
Provisional age-standardised mortality rates for deaths due to COVID-19 by sex, English regions and Welsh health boards.

Deaths involving COVID-19 by month of registration, UK
Dataset | Released 21 October 2022
Provisional age-standardised mortality rates for deaths involving COVID-19 by sex and month of death registration, for England, Wales, Scotland and Northern Ireland.

Deaths registered monthly in England and Wales
Dataset | Released 21 October 2022
Number of deaths registered each month by area of usual residence for England and Wales, by region, county, local and unitary authority, and London borough.

Single year of age and average age of death of people whose death was due to or involved COVID-19
Dataset | Released on 21 October 2022
Provisional deaths registration data for single year of age and average age of death (median and mean) of persons whose death involved coronavirus (COVID-19), England and Wales. Includes deaths due to COVID-19 and breakdowns by sex.

Pre-existing conditions of people who died due to COVID-19, England and Wales
Dataset | Released 21 October 2022
Pre-existing conditions of people who died due to COVID-19, broken down by country, broad age group, and place of death occurrence, usual residents of England and Wales.

10 . Glossary

Age-specific mortality rates

Age-specific mortality rates are used to allow comparisons between specified age groups.

Age-standardised mortality rates

Age-standardised mortality rates (ASMRs) are used to allow comparisons between populations that may contain different proportions of people of different ages. The 2013 European Standard Population is used to standardise rates. In this bulletin, we have adjusted the monthly ASMRs to allow for comparisons with annual rates. For more information see Section 11: Measuring the data.

Coronaviruses

The World Health Organization (WHO) defines coronaviruses as "a large family of viruses that are known to cause illness ranging from the common cold to more severe diseases such as Middle East respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS)". Between 2001 and 2018, there were 12 deaths in England and Wales due to a coronavirus infection, with a further 13 deaths mentioning the virus as a contributory factor on the death certificate.

Coronavirus (COVID-19)

COVID-19 refers to the "coronavirus disease 2019" and is a disease that can affect the lungs and airways. It is caused by a type of coronavirus. Further information about coronavirus (COVID-19) disease is available from the WHO.

Pre-existing condition

A pre-existing condition is defined as any condition that either preceded the disease of interest (for example, COVID-19) in the sequence of events leading to death, or was a contributory factor in the death but not part of the causal sequence.

More information on the pre-existing conditions methodology is available in our accompanying dataset, Pre-existing conditions of people who died due to COVID-19, England and Wales.

Registration delay

Mortality statistics are compiled from information supplied when deaths are certified and registered as part of civil registration, a legal requirement. According to the Births and Deaths Registration Act 1953, a death should be registered within five days unless it is referred to a coroner for investigation. Mortality statistics for a given time period can be based on occurrence (death date) or registration (registration date); registration delay is the difference between date of occurrence and date of registration.

Statistical significance

The term "significant" refers to statistically significant changes or differences. Significance has been determined using the 95% confidence intervals, where instances of non-overlapping confidence intervals between estimates indicate the difference is unlikely to have arisen from random fluctuation.

95% confidence intervals

A confidence interval is a measure of the uncertainty around a specific estimate. If a confidence interval is 95%, it is expected that the interval will contain the true value on 95 occasions if repeated 100 times. As intervals around estimates widen, the level of uncertainty about where the true value lies increases. The size of the interval around the estimate is strongly related to the number of deaths, prevalence of health states and the size of the underlying population. At a national level, the overall level of error will be small compared with the error associated with a local area or a specific age and sex breakdown. More information is available on our uncertainty pages.

11 . Measuring the data

This bulletin provides timely surveillance of mortality in England and Wales, based on the best available provisional data, including all-cause mortality and coronavirus (COVID-19) deaths.

Analysis contains deaths registered in September 2022 by age and sex, and also includes deaths that occurred in September 2022 by date of death. Non-residents of England and Wales are excluded. In September 2022, there were 94 deaths of non-residents that were registered in England and Wales.

Data sources

This bulletin is based primarily on death registrations. Analysis by month of death registration is consistent with our weekly death registrations bulletin and allows for a more timely analysis than would be possible using death occurrences. There is a section on death occurrences for surveillance of recent mortality trends. Death occurrences show the number of deaths that occurred within a calendar period and give a better indication of exactly when deaths were at their highest. This allows mortality to be related to other factors such as weather patterns.

A provisional extract of death registrations and death occurrences data is taken on the first working day after the eighth of the month, to allow time for deaths to be registered. For more detail on the data sources used, see our methodology article.

Definition of COVID-19 deaths

We use the term "due to COVID-19" when referring only to deaths with an underlying cause of death of COVID-19. When considering all of the deaths that had COVID-19 mentioned anywhere on the death certificate, whether as an underlying cause or not, we use the term "involving COVID-19". The International Classification of Diseases (ICD-10) codes used to define COVID-19 are:

- U07.1: COVID-19, virus identified
- U07.2: COVID-19, virus not identified
- U09.9: post-COVID condition, unspecified (this cannot be assigned to the underlying cause of death so is not included in the "deaths due to COVID-19" definition)
- U10.9: multisystem inflammatory syndrome associated with COVID-19, unspecified

Our definition of COVID-19 (regardless of whether it was the underlying cause or mentioned elsewhere on the death certificate) includes some cases where the certifying doctor suspected the death involved COVID-19 but was not certain (U07.2). For example, a doctor may have clinically diagnosed COVID-19 based on symptoms but this diagnosis may not have been confirmed with a test, so they may write "suspected COVID-19" on the death certificate. Of the 159,068 deaths due to COVID-19, 4,157 (2.6%) were classified as "suspected" COVID-19. Including all 187,140 deaths involving COVID-19, "suspected" COVID-19 was recorded on 4,791 deaths (2.6%) of all deaths involving COVID-19 in England and Wales (excluding non-residents). For more information on the ICD-10 definition of COVID-19, see our methodology article.

There are several ICD-10 codes not included in our definitions of deaths due to COVID-19 and deaths involving COVID-19. These are:

- U08.9: personal history of COVID-19, unspecified
- U11.9: need for immunisation against COVID-19, unspecified
- U12.9: COVID-19 vaccines causing adverse effects in therapeutic use, unspecified

Tables 12 and 13 of our accompanying dataset provide figures of each COVID-19 ICD-10 code registered since March 2020. Our figures usually consist of first registrations only. On occasion, and after further investigation, a death can be re-registered as a different cause of death. For transparency of our statistics, these tables include re-registrations as well as initial registrations; all other figures remain as first registration only.

Monthly mortality rates

To calculate monthly mortality rates that are comparable with annual rates, adjustments must be made to annual population estimates to account for the time period covered. Our methodology article provides more detail on how this is calculated.

Acknowledgement

We would like to thank Anisah Saib, Rachel Woods, Andreas Christofi and Paul Brown for their valued contribution to this bulletin.

12 . Strengths and limitations

Provisional data are used

Provisional death registrations and death occurrences data are used in this bulletin. This enables timely analysis to be completed to monitor mortality trends. However, as the data for 2022 are provisional, they are subject to change.

Data coverage, timeliness and registration delays

Mortality data give complete population coverage. They ensure the estimates are of high precision and representative of the underlying population at risk. However, because of registration delays, monthly death occurrence data are always somewhat incomplete. This is especially true for deaths that occurred towards the end of the month.

More quality and methodology information on strengths, limitations, appropriate uses and how the data were created is available in our Mortality statistics in England and Wales Quality and Methodology Information and our User guide to mortality statistics.

13 . Related links

Deaths registered weekly in England and Wales
Bulletin | Released weekly
Provisional counts of the number of deaths registered in England and Wales, including deaths involving coronavirus (COVID-19), in the latest weeks for which data are available.

Death registration summary statistics, England and Wales: 2021
Article | Released 9 June 2022
Number of deaths registered by year, sex, area of usual residence and selected underlying cause of death.

Deaths registered in England and Wales: 2021
Bulletin | Released 1 July 2022
Registered deaths by age, sex, selected underlying causes of death and the leading causes of death. Contains death rates and death registrations by area of residence and single year of age.

Deaths due to COVID-19, registered in England and Wales: 2021
Article | Released 1 July 2022
Deaths registered in England and Wales due to coronavirus (COVID-19) by age, sex, region, indices of deprivation, place of death and pre-existing condition.

Coronavirus (COVID-19) latest data and analysis
Web page | Updated as and when new data become available
Brings together the latest data and analysis on the coronavirus (COVID-19) pandemic in the UK and its effect on the economy and society.

Excess mortality and mortality displacement in England and Wales: 2020 to mid-2021
Article | Released 15 October 2021
Deaths registered in England and Wales by week, from 28 December 2019 to 2 July 2021. Breakdowns include country, sex, age group, region, place of death and leading cause. Includes analysis of excess deaths and relative cumulative age-standardised mortality rates.

Excess deaths in England and Wales: March 2020 to June 2022
Article | Released 20 September 2022
Number of excess deaths, including deaths due to coronavirus (COVID-19) and due to other causes. Including breakdowns by age, sex and geography.

14 . Cite this statistical bulletin

Office for National Statistics (ONS), published 21 October 2022, ONS website, statistical bulletin, Monthly mortality analysis, England and Wales: September 2022