

Statistical bulletin

Monthly mortality analysis, England and Wales: September 2020

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

Contact:
Health Statistics and Research
Health.Data@ons.gov.uk
+44 (0)1633 456022

Release date:
23 October 2020

Next release:
19 November 2020

Table of contents

1. [Main points](#)
2. [Death registrations and the overall mortality rate for September 2020](#)
3. [Deaths due to COVID-19 registered in September 2020](#)
4. [Leading causes of death registered in September 2020](#)
5. [Age-standardised mortality rates by sex and age group, in September 2020](#)
6. [Deaths registered in the year-to-date](#)
7. [Death occurrences in September 2020 and year-to-date](#)
8. [Monthly Mortality Data](#)
9. [Glossary](#)
10. [Measuring the data](#)
11. [Strengths and limitations](#)
12. [Related links](#)

1 . Main points

- In September 2020, there were 39,827 deaths registered in England, 2,568 deaths more than the five-year average (2015 to 2019) for September; in Wales, there were 2,610 deaths registered, 135 deaths more than the five-year average for September.
- The leading cause of death in September 2020 was dementia and Alzheimer's disease in both England (accounting for 11.2% of all deaths) and in Wales (11.1% of all deaths).
- The coronavirus (COVID-19) did not feature in the top ten leading causes of death for deaths registered in September 2020, in England or Wales; in England, COVID-19 was the 19th most common cause of death and in Wales COVID-19 was the 24th most common cause of death.
- The age-standardised mortality rate of deaths in September due to COVID-19 was 12.6 per 100,000 people in England and was 10.8 per 100,000 people in Wales; in England for the first time since April, the COVID-19 mortality rate significantly increased compared with the previous month.
- When considering deaths registered in 2020 to date (1 January to 30 September) in England, the age-standardised mortality rate for deaths registered in 2020 was significantly higher than the mortality rate in the same period back to 2009.
- Looking at deaths that have occurred so far in 2020 and were registered by 10 October, 405,534 deaths occurred in England (35,665 more than the five-year average for January to September) and 26,002 in Wales (1,154 more than the five-year average).
- In January to September 2020, COVID-19 was the underlying cause of death in 11.5% of all deaths that occurred in England (46,501 deaths) and 9.0% of all deaths in Wales (2,342 deaths).
- Deaths that have occurred so far in 2020 (and were registered by 10 October) most commonly occurred in hospitals (41.0% of all deaths in England, 47.9% in Wales), but the proportion of deaths in hospital was lower than the five-year average, with a greater proportion of deaths occurring in private homes and care homes compared with the five-year average.

2 . Death registrations and the overall mortality rate for September 2020

In September 2020 there were 39,827 deaths registered in England. This was 2,365 more deaths than in September 2019, and 2,568 more than the five-year average (2015 to 2019) for September. Of the deaths registered in September 2020, 20,236 were males and 19,591 were females.

In Wales, there were 2,610 deaths registered in September 2020. This was 157 more deaths than in September 2019 and 135 more deaths than the five-year average for September. Of the deaths registered in September in Wales, there were 1,339 male deaths and 1,271 female deaths.

Age-standardised mortality rates (ASMRs) are used for comparisons over time rather than numbers of deaths, as ASMRs account for changes to the population size and age structure. September 2003 was the year with the highest mortality rate in September since our time series began in 2001. Since then, overall mortality rates in England for the month of September had been decreasing from 1,157.1 deaths per 100,000 people in 2003, to a low of 794.0 deaths per 100,000 people in September 2018. However, the overall mortality rate significantly increased in September 2019 (839.8 deaths per 100,000 people) and in September 2020 (882.3 deaths per 100,000 people). The statistically significant decrease in age-standardised mortality rates from 2003 was seen in both males and females (Figure 1). In September 2020, the mortality rate was 1034.2 deaths per 100,000 males (compared with 1,394.2 in September 2003) and 755.9 deaths per 100,000 females (compared with 986.5 in September 2003).

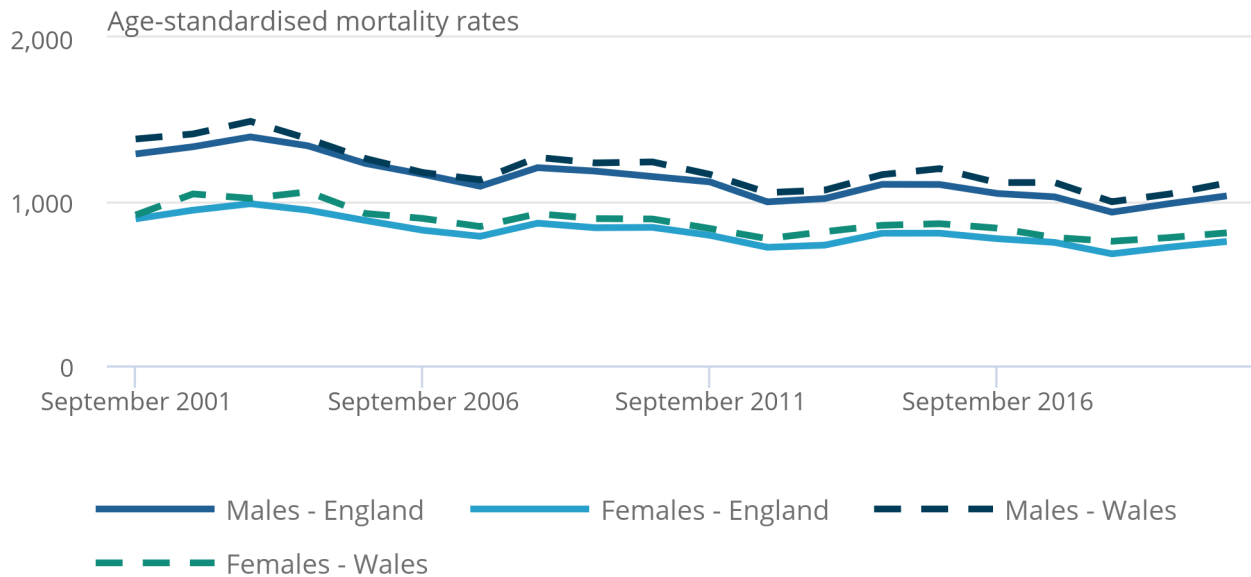
Mortality rates in Wales show a similar pattern over time, significantly decreasing from 1,213.2 deaths per 100,000 people in September 2003 to 945.1 deaths per 100,000 people in September 2020. This significant decrease was seen in both males and females, with the highest male mortality rates seen in September 2003 and the highest female mortality rates seen in September 2004. In September 2020 in Wales, the mortality rate was 1113.0 deaths per 100,000 males (1,489.2 in September 2003) and 808.6 deaths per 100,000 females (1,059.0 in September 2004).

Figure 1: Mortality rates for the month of September have fallen between 2003 and 2020

Age-standardised mortality rates by sex, England and Wales, deaths registered in September 2001 to September 2020

Figure 1: Mortality rates for the month of September have fallen between 2003 and 2020

Age-standardised mortality rates by sex, England and Wales, deaths registered in September 2001 to September 2020



Source: Office for National Statistics

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 [Section 10: Measuring the data](#).
2. Figures are for deaths registered rather than deaths occurring in each period.
3. Figures for 2020 are based on provisional mortality data and projected populations.
4. Figures exclude non-residents of England and Wales.

Although mortality rates have reduced over time, the rate of decline in mortality rates has been slowing since 2011. More information about how mortality rates have changed over a longer time period can be found in [Changing trends in mortality in England and Wales](#).

3 . Deaths due to COVID-19 registered in September 2020

Of the 39,827 deaths registered in September 2020 in England, 1.7% (690 deaths) involved the coronavirus (COVID-19). In Wales, 1.3% of the 2,610 deaths registered in September involved COVID-19 (35 deaths).

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 the [User guide to mortality statistics](#). In most cases (92.0% in England and 89.7% in Wales) where COVID-19 was mentioned on the death certificate, it was found to be the underlying cause of death. The analysis of COVID-19 deaths in this bulletin focusses only on deaths where COVID-19 was the underlying cause (deaths "due to" COVID-19). A comparison of the numbers of deaths "involving" and "due to" COVID-19 between March and June 2020 is available in our [Deaths involving COVID-19](#) publication.

Our definition of COVID-19 includes some cases where the certifying doctor suspected the death involved COVID-19 but was not certain, for example, because no test was done. Of the 48,698 deaths with an underlying cause of COVID-19 in England and Wales, 3,905 (8.0%) were classified as "suspected" COVID-19.

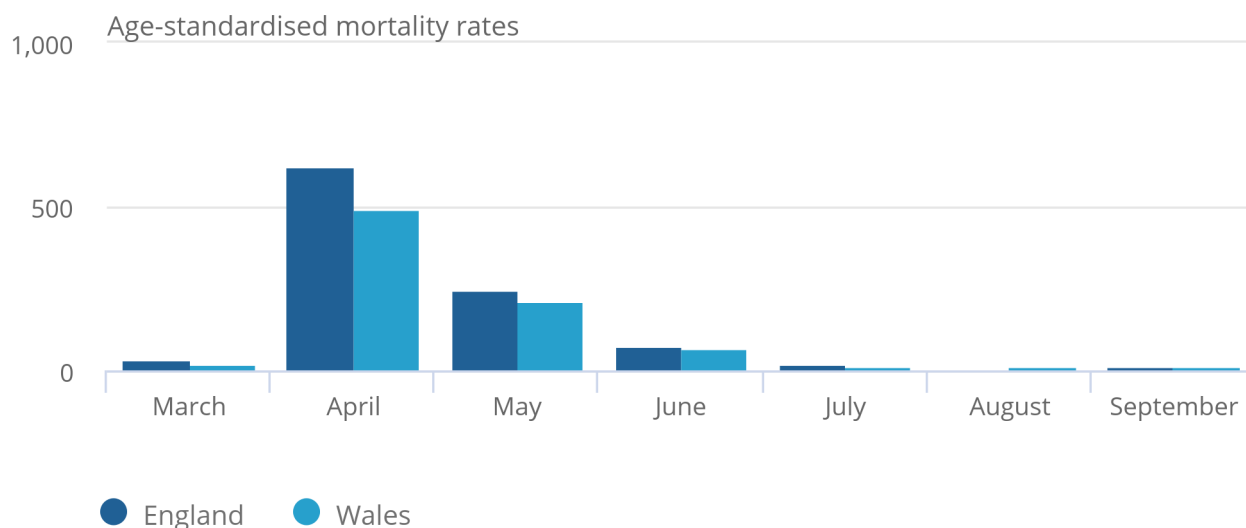
Analysis of COVID-19 deaths in this bulletin, includes only those deaths with an underlying cause of death of COVID-19, referred to as "due to COVID-19". This is different from deaths "involving COVID-19" used in other publications, which includes deaths that had COVID-19 mentioned anywhere on the death certificate, whether as underlying cause or not.

Figure 2: Mortality rates due to COVID-19 increased for the first time since April

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

Figure 2: Mortality rates due to COVID-19 increased for the first time since April

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



Source: Office for National Statistics

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 [Section 10: Measuring the data](#).
2. Figures are for deaths registered rather than deaths occurring in each period.
3. Figures for 2020 are based on provisional mortality data and projected populations.
4. Figures exclude non-residents of England and Wales.
5. Deaths "due to COVID-19" include only deaths where COVID-19 was the underlying cause of death.

When adjusting for the size and age structure of the population, mortality rates for deaths due to COVID-19 have increased for the first time since the peak in April 2020 (Figure 2). There were 12.6 deaths due to COVID-19 per 100,000 people in England registered in September 2020, a 98.0% decrease compared with April 2020 (623.2 deaths per 100,000 people). In Wales, the rate of death due to COVID-19 was 10.8 deaths per 100,000 people in September 2020, which was 97.8% lower than the rate seen in April 2020 (495.1). In September 2020, the rate of deaths due to COVID-19 returned to being lower in Wales than in England, but this difference was not significant.

In September 2020, the number of deaths and mortality rate due to COVID-19 remained significantly below levels seen in March 2020 (the first month a COVID-19 death was registered in England and Wales). However, the mortality rate due to COVID-19 was [significantly](#) higher in England in September 2020 compared with the previous month (August 2020). The mortality rate due to COVID-19 also increased in Wales, but this was not significant. This is the first increase in the mortality rate for deaths due to COVID-19 from one month to the next since April 2020.

4 . Leading causes of death registered in September 2020

Our [leading causes of death groupings](#) are based on a list developed by the World Health Organization (WHO). This categorises causes of death using the International Classification of Diseases, tenth edition (ICD-10) into groups that are epidemiologically more meaningful than single ICD-10 codes, for the purpose of comparing the most common causes of death in the population.

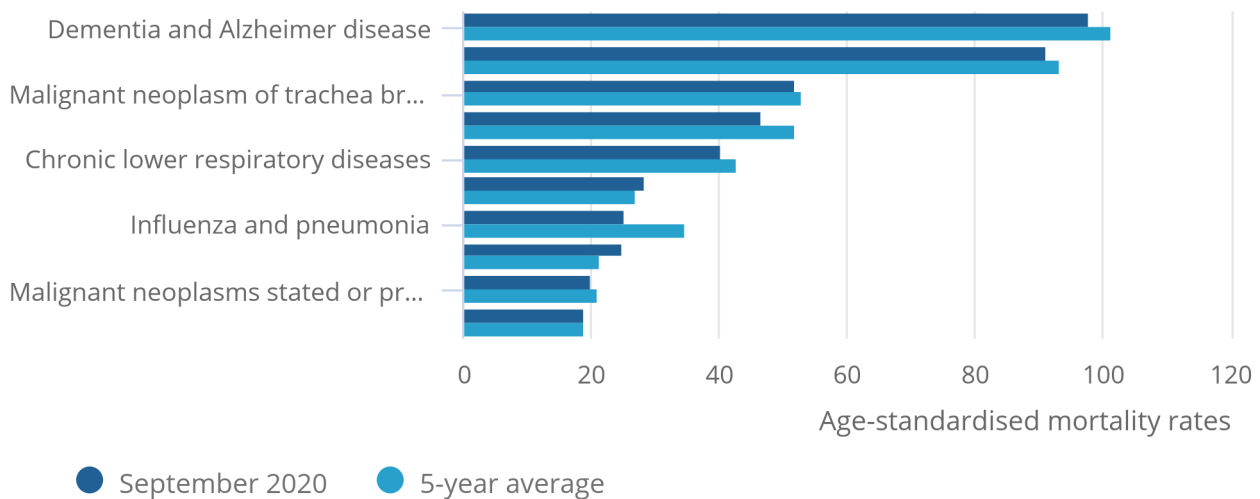
Figures 3 and 4 show the 10 most common underlying causes of death registered in September 2020 for England and Wales, compared with the five-year average for September (2015 to 2019).

Figure 3: In England, six of the ten leading causes of death were not significantly different to the five-year average in September 2020

Age-standardised mortality rate for selected leading causes of death, per 100,000 people, England, deaths registered in September 2020

Figure 3: In England, six of the ten leading causes of death were not significantly different to the five-year average in September 2020

Age-standardised mortality rate for selected leading causes of death, per 100,000 people, England, deaths registered in September 2020



Source: Office for National Statistics

Notes:

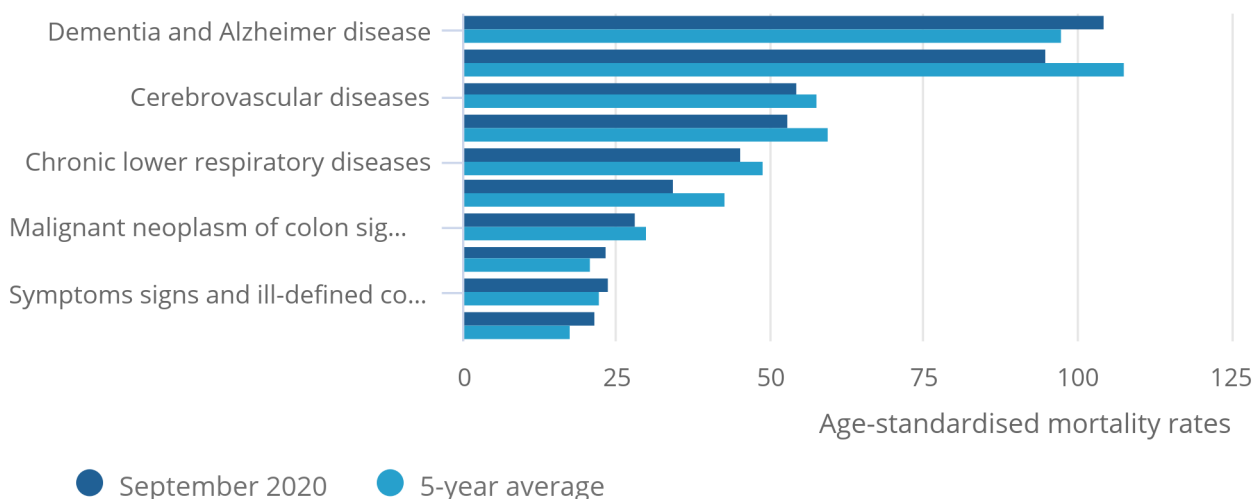
1. Age-standardised mortality rates per 100,000 people, standardised to the 2013 European Standard Population. Monthly rates in this bulletin are adjusted to allow for comparisons with annual rates. For more information, see [Section 10: Measuring the data](#).
2. Figures are for deaths registered rather than deaths occurring in each period.
3. Figures for 2020 are based on provisional mortality data and projected populations.
4. Figures exclude non-residents of England and Wales.

Figure 4: In Wales, dementia and Alzheimer’s was the leading cause of death in September 2020

Age-standardised mortality rate for selected leading causes of death, per 100,000 people, Wales, deaths registered in September 2020

Figure 4: In Wales, dementia and Alzheimer’s was the leading cause of death in September 2020

Age-standardised mortality rate for selected leading causes of death, per 100,000 people, Wales, deaths registered in September 2020



Source: Office for National Statistics

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 [Section 10: Measuring the data](#).
2. Figures are for deaths registered rather than deaths occurring in each period.
3. Figures for 2020 are based on provisional mortality data and projected populations.
4. Figures exclude non-residents of England and Wales.

In England, dementia and Alzheimer's disease was the leading cause of death for deaths registered in September 2020, with 97.9 deaths per 100,000 people (4,449 deaths). This is in line with the [annual leading causes of death](#) data; dementia and Alzheimer's disease has been the leading cause of death in England since 2015. The second most common cause of death was ischaemic heart diseases (91.1 deaths per 100,000 people, 4,104 deaths).

In September 2020, two of the ten leading causes of death were significantly below the five-year average for England (Figure 3) and six out of ten showed no significant difference to the five-year average.

When comparing deaths registered in September 2020 with the five-year average in England, the largest difference was in deaths with an underlying cause of influenza and pneumonia. The age-standardised mortality rate in September 2020 was 27.7% lower than the five-year average. This differs in comparison to our weekly report as this publication reports deaths where influenza and pneumonia was considered the underlying cause of death and not where influenza and pneumonia was mentioned anywhere on the death certificate. [Influenza and pneumonia was the third most common pre-existing condition](#) for deaths involving COVID-19 in April to June 2020. So, deaths that would have likely occurred throughout the rest of 2020 due to influenza and pneumonia may have occurred earlier, during April and May 2020, due to the COVID-19 pandemic.

In Wales, dementia and Alzheimer's disease was the leading cause of death, with 290 deaths registered in September 2020 (104.4 deaths per 100,000 people). This was followed by ischaemic heart diseases, with 261 deaths (94.9 deaths per 100,000 people). None of the top 10 leading causes of death for Wales were significantly different from the five-year average.

In both England and Wales, COVID-19 did not feature in the top ten leading causes of death in September 2020. In England, COVID-19 was the 19th most common cause of death and in Wales COVID-19 was the 24th most common cause of death, for deaths registered in September 2020.

More in-depth analysis of leading causes of death is available for the [UK](#) (2001 to 2018) and [England and Wales](#) (2019).

5 . Age-standardised mortality rates by sex and age group, in September 2020

Most deaths registered typically occur in those who are aged 75 years and over. For this reason, age-standardised mortality rates (ASMR) for those aged under 75 years and those aged 75 years and over have been analysed separately. Age-specific mortality rates by five-year age groups for ages 75 years and over are available in the accompanying dataset.

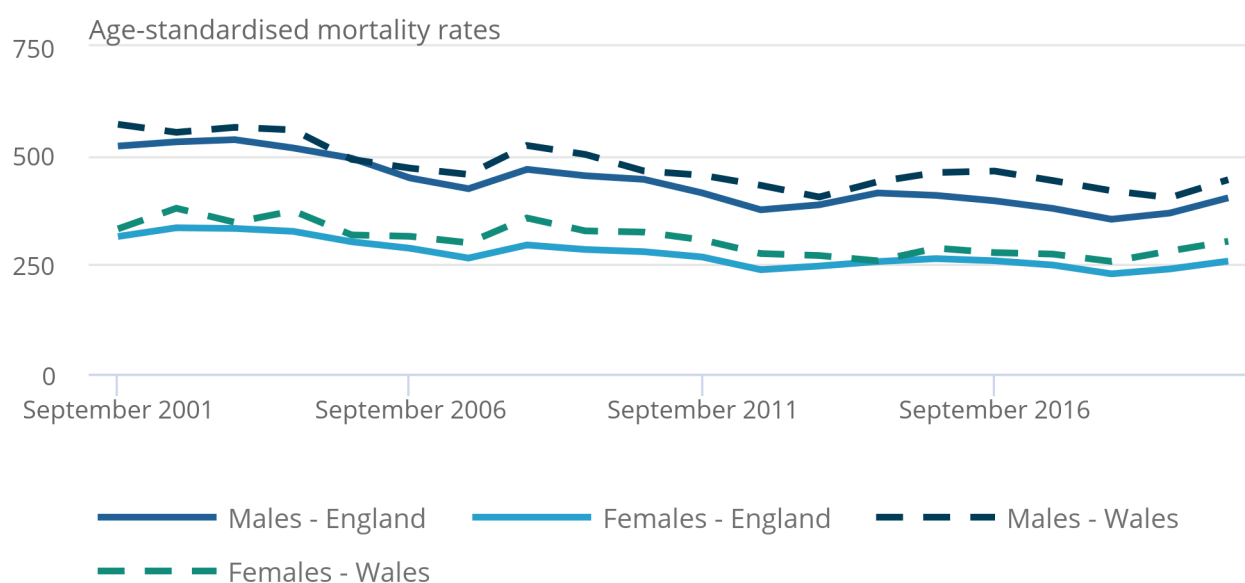
Generally, since 2001, the age-standardised mortality rates for people aged 0 to 74 years across both England and Wales have been decreasing. In September 2020 there were 328.6 deaths per 100,000 people in England (413.4 in September 2001) and 372.2 deaths per 100,000 people in Wales (445.8 in September 2001). This decline in mortality rates can be seen in both males and females aged 0 to 74 years (Figure 5).

Figure 5: In September 2020 mortality rates in England, for people aged under 75 years, were significantly higher than September 2019

Age-standardised mortality rates by sex, ages 0 to 74 years, deaths registered in September 2001 to 2020, England and Wales

Figure 5: In September 2020 mortality rates in England, for people aged under 75 years, were significantly higher than September 2019

Age-standardised mortality rates by sex, ages 0 to 74 years, deaths registered in September 2001 to 2020, England and Wales



Source: Office for National Statistics

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 [Section 10: Measuring the data](#).
2. Figures are for deaths registered rather than deaths occurring in each period.
3. Figures for 2020 are based on provisional mortality data and projected populations.
4. Figures exclude non-residents of England and Wales.

Similar to the mortality trends seen across all age groups, improvements to mortality rates for male and females aged 0 to 74 years have slowed since 2011. Age-standardised mortality rates in September 2020 significantly increased compared with September 2019, across males and females in England, but in Wales September 2019 and September 2020 were not significantly different.

In people aged 75 years and above, mortality rates have also generally improved since 2001 (Figure 6). In September 2020, people aged 75 years and above had a mortality rate of 6,481.1 deaths per 100,000 people in England (7591.7 in September 2001), and 6,736.8 deaths per 100,000 people in Wales (7805.5 in September 2001).

Compared with September 2019, the mortality rate in September 2020 significantly increased for females aged 75 years and above (3.6% higher) in England. An increase was also seen in males (2.4%) but this was not significant. The ASMR per 100,000 people for deaths registered in September 2020 was 3.3% higher than in September 2019 (6273.5 per 100,000 people); when comparing with 2019, this is the first increase in monthly mortality rate since June.

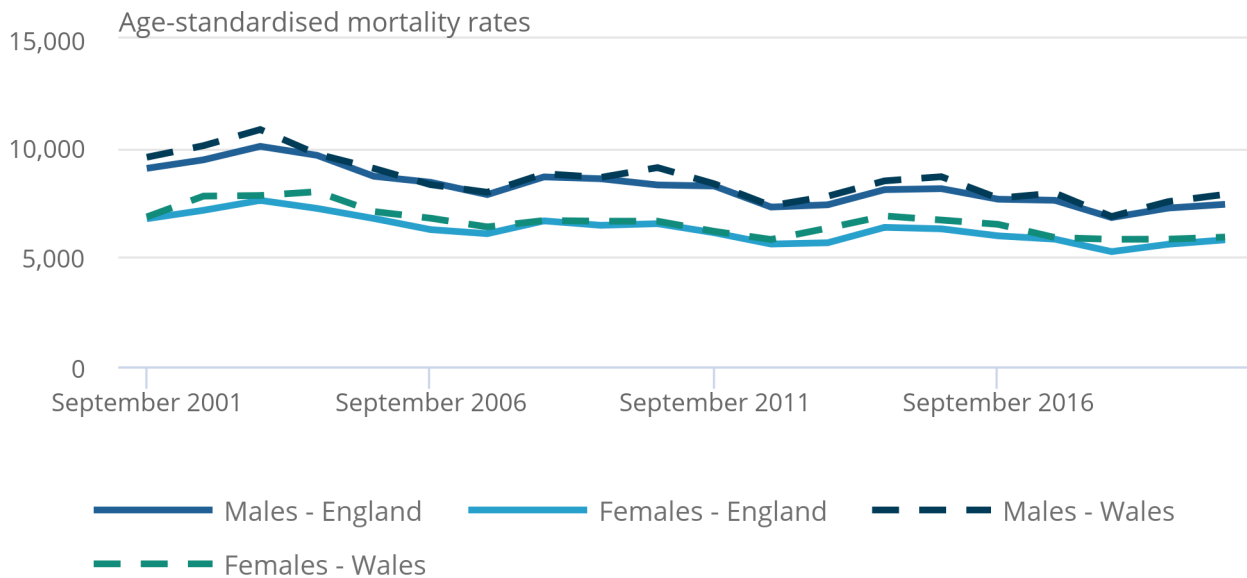
In Wales, September 2020 overall mortality rates for those aged 75 years and above increased compared with September 2019 (3.3% higher) but was not significantly higher. This increase was seen for both males (4.4% higher) and females (1.6% higher).

Figure 6: Mortality rates in September 2020, for males and females aged 75 years and above in England and Wales, have increased compared with September 2019

Age-standardised mortality rates by sex, ages 75 years and over, deaths registered in September 2001 to 2020, England and Wales

Figure 6: Mortality rates in September 2020, for males and females aged 75 years and above in England and Wales, have increased compared with September 2019

Age-standardised mortality rates by sex, ages 75 years and over, deaths registered in September 2001 to 2020, England and Wales



Source: Office for National Statistics

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 [Section 10: Measuring the data](#).
2. Figures are for deaths registered rather than deaths occurring in each period.
3. Figures for 2020 are based on provisional mortality data and projected populations.
4. Figures exclude non-residents of England and Wales.

6 . Deaths registered in the year-to-date

There were 425,972 deaths registered in England and 27,112 in Wales during the first nine months (January to September) of 2020.

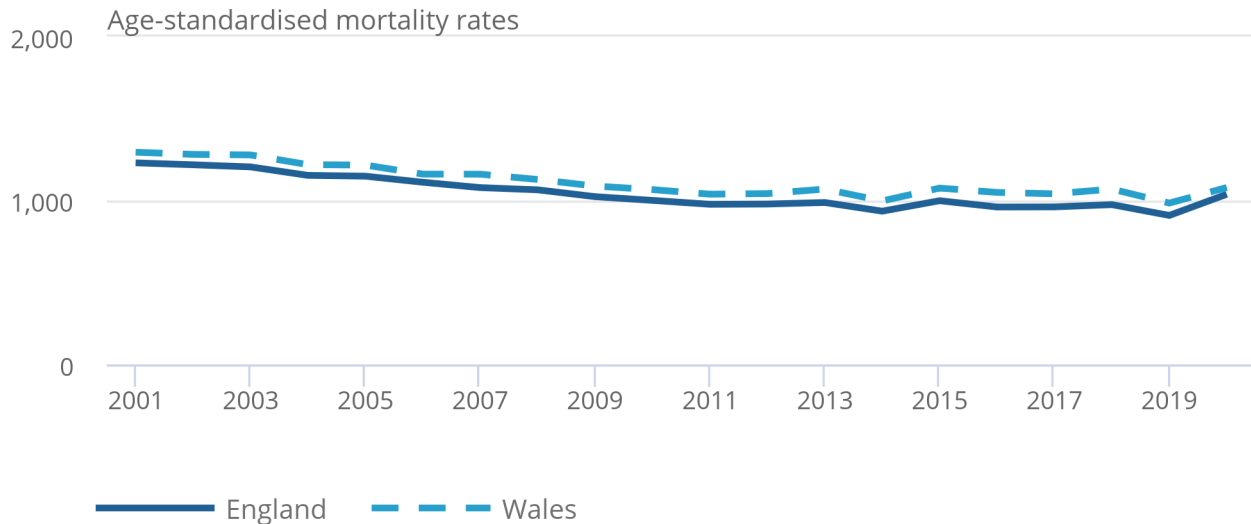
To gain a better idea of year-to-year differences in mortality rates, we calculated year-to-date age-standardised mortality rates (ASMR) based on deaths registered between 1 January and 30 September in each year from 2001 to 2020 (Figure 7). For England, the year-to-date age-standardised mortality rate for 2020 was 1,038.1 deaths per 100,000 people, which was statistically significantly higher than all years between 2009 and 2019. For Wales, the year-to-date age-standardised mortality rate for 2020 was 1079.2 deaths per 100,000 people. This was significantly higher than the first nine months of 2019 (a particularly low year), but not significantly different from 2018.

Figure 7: Mortality rates for 2020 to date in England are statistically significantly higher than all years since 2009

Age-standardised mortality rates, deaths registered between 1 January and 30 September 2001 to 2020, England and Wales

Figure 7: Mortality rates for 2020 to date in England are statistically significantly higher than all years since 2009

Age-standardised mortality rates, deaths registered between 1 January and 30 September 2001 to 2020, England and Wales



Source: Office for National Statistics

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 [Section 10: Measuring the data](#).
2. Figures are for deaths registered rather than deaths occurring in each period.
3. Figures for 2020 are based on provisional mortality data and projected populations.
4. Figures exclude non-residents of England and Wales.

7 . Death occurrences in September 2020 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. Analysis of deaths by date of registration is useful as the figures are comparable across time and geography. Owing to the length of time that it takes a death to be registered, using data based on registration can mean that we are not monitoring the most current death trends. For example, a death registered in September 2020 could have occurred in a previous month or even a previous year. Further information regarding death occurrences and registration delays can be found in [Section 10: Measuring the data](#).

Between 1 January and 30 September 2020, 405,534 deaths occurred in England and were registered by 10 October. This was 35,665 more deaths than the five-year average (2015 to 2019) for January to September. Of the 405,534 deaths that occurred, 11.1% were due to COVID-19 (46,501 deaths). In Wales, 26,002 deaths occurred in 2020 to date, which was 1,154 more deaths than the five-year average. COVID-19 was the underlying cause of death in 9.0% of all deaths that occurred (2,342 deaths).

In England, the first death due to COVID-19 occurred on 30 January 2020 (Figure 9). Since 11 March, the number of COVID-19 deaths occurring on each day rose (except for 6 April 2020, when it decreased by 13 deaths) until the peak of 1,224 deaths that occurred on 8 April 2020. Since 8 April, the number of deaths each day had been decreasing, however the number of deaths in a day has been increasing throughout September with 45 deaths occurring on the 30 September. This is the highest number of deaths occurring in a day since 30 June (57 deaths). The number of recorded deaths on more recent dates are likely to rise as we receive more death registrations.

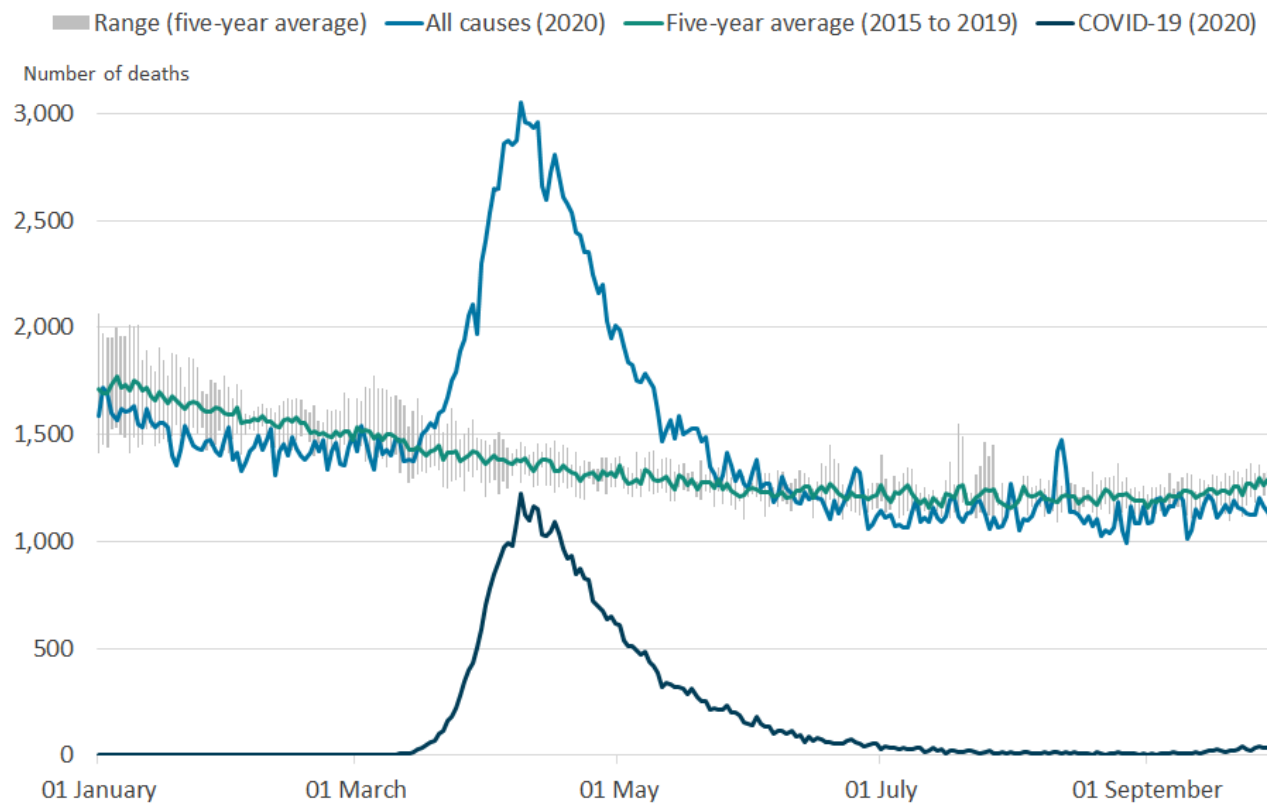
In Wales, the first death with an underlying cause of COVID-19 occurred on 15 March. As in England, the number of COVID-19 deaths per day reached the peak on 8 April 2020, when 70 deaths due to COVID-19 occurred in Wales. Since 8 April, the number of COVID-19 deaths occurring each day in Wales has gradually decreased, with three deaths due to COVID-19 occurring on 30 September (though this may be higher due to registrations delays).

It is important to note that the number of death occurrences is incomplete as 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 September was below the range of the last five years are likely to be a result of when the data extract was created, as deaths that occurred towards the end of the month may not have been registered by that time. We would therefore expect the number of death occurrences to be higher in future releases.

Figure 8: Daily deaths due to COVID-19 in England have increased in September

Number of deaths occurring on each day in 2020¹, five-year average and range, England



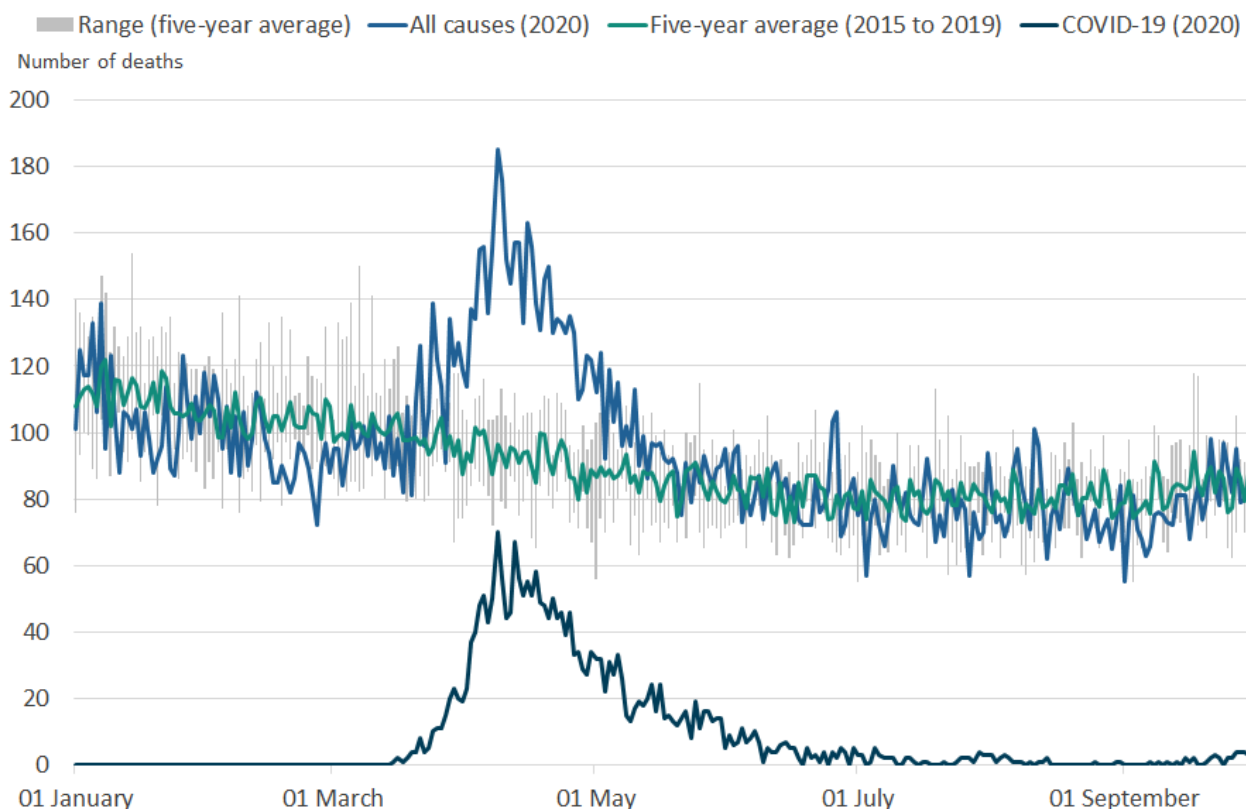
Source: Office for National Statistics

Notes:

1. Figures are for deaths occurring on each day rather than deaths registered, registered up to 10 October 2020. Death occurrences will increase as more deaths are registered, particularly for later dates.
2. The range is the difference between the minimum and maximum value observed on each day during the five-year period (1 January to 30 September 2015 to 2019).
3. Figures exclude non-residents.
4. For 29 February, only data for leap years are included in the five-year average.

Figure 9: Deaths due to COVID-19 in Wales have gradually decreased, after the peak of 70 deaths on 8 April 2020

Number of deaths occurring on each day in 2020¹, five-year average and range, Wales



Source: Office for National Statistics

Notes:

1. Figures are for deaths occurring on each day rather than deaths registered, registered up to 10 October 2020. Death occurrences will increase as more deaths are registered, particularly for later dates.
2. The range is the difference between the minimum and maximum value observed on each day during the five-year period (1 January to 30 September 2015 to 2019).
3. Figures exclude non-residents.
4. For 29 February, only data for leap years are included in the five-year average.

In both England and Wales, the proportions of deaths that occurred in hospital were lower in 2020 to date (January to September) than the five-year average (January to September 2015 to 2019). Of the 405,534 deaths that occurred in England in 2020 (and were registered by 10 October), 41.0% (166,168 deaths) occurred in hospital, compared with 46.2% for the five-year average. In Wales, 47.9% of the 26,002 deaths that occurred in 2020 to date happened in hospital (12,455 deaths), compared with 54.2% for the five-year average.

The percentages of deaths that occurred in private homes and care homes were higher in 2020 than the five-year average. More than a quarter of deaths in 2020 to date occurred in private homes in both England (26.7% in 2020, compared with 23.5% for the five-year average) and Wales (28.6% in 2020, compared with 24.4% for the average). Deaths in care homes accounted for a quarter of deaths in England (25.5%) and almost a fifth of deaths in Wales (19.6%), both greater than the proportions for the five-year averages (22.1% in England, 16.4% in Wales).

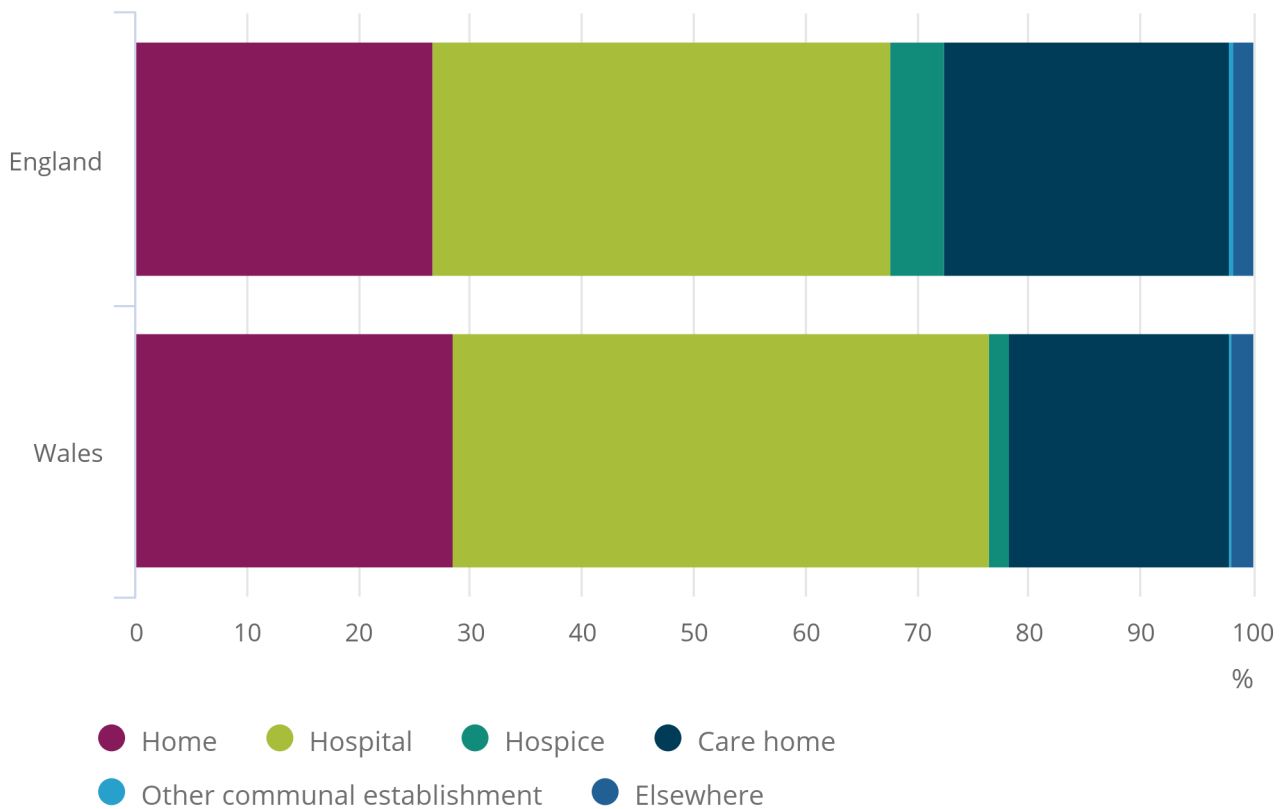
Further data on deaths by place of occurrence, by age and month, are available in the accompanying datasets. Data on deaths involving COVID-19 by place of death occurrence are published in [Deaths registered weekly in England and Wales](#), and in-depth analysis of [deaths involving COVID-19 in the care sector](#) is also available.

Figure 10: Deaths in 2020 to date occurred mostly in hospitals, followed by private homes and care homes

Number of deaths by place of occurrence, deaths occurring in January to September 2020 and registered by 10th October 2020, England and Wales

Figure 10: Deaths in 2020 to date occurred mostly in hospitals, followed by private homes and care homes

Number of deaths by place of occurrence, deaths occurring in January to September 2020 and registered by 10th October 2020, England and Wales



Source: Office for National Statistics

Notes:

1. Figures are for deaths occurring in January to September 2020 rather than deaths registered, registered up to 10 October 2020. Death occurrences will increase as more deaths are registered.
2. Figures exclude non-residents.
3. Hospital includes acute and community hospitals, but does not include psychiatric hospitals.

8 . Monthly Mortality Data

[Monthly Mortality Analysis, England and Wales](#)

Dataset | Released 23 October 2020

Monthly data on death registrations and death occurrences in England and Wales, broken down by sex and age. Includes deaths due to the coronavirus (COVID-19) by date of death occurrence, and comparisons of COVID-19 with the leading causes of death.

9 . 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 10: 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 is available from the [WHO](#).

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. In some circumstances, significance has also been tested using z scores. More information about this z test is available in Appendix 1 of the [Sullivan guide](#).

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](#).

10 . Measuring the data

More quality and methodology information on strengths, limitations, appropriate uses, and how the data were created is available in the [Mortality statistics in England and Wales QMI](#) and [User guide to mortality statistics](#).

The purpose of this bulletin is to provide timely surveillance of mortality in England and Wales, based on the best available provisional data, including all-cause mortality and deaths where COVID-19 was the underlying cause.

The analysis contains deaths registered in September 2020 by age and sex, and also includes deaths that occurred in September 2020 by date of death. This expands on the quarterly data for England that were previously published in the [Quarterly Mortality Report](#). Non-residents of England and Wales are excluded from this analysis. In September 2020 there were 69 deaths of non-residents that were registered in England and Wales.

This bulletin includes deaths where COVID-19 was the underlying cause of death, compared with other causes of death, as well as mortality rates for deaths due to COVID-19. This replaces data previously published in the [Deaths involving COVID-19 bulletin](#), but the analysis published here differs in that it uses the month the death was registered, rather than the month the death occurred.

Analysis by month of death registration is consistent with the [weekly death registrations release](#) and allows for a more timely analysis than would be possible using death occurrences. This is because a proportion of deaths that occurred in the previous month would not yet have been registered. On average, there is a delay of five days between a death occurring and it being registered, but this can be much longer, especially for certain causes of death. More information on this issue can be found in our [impact of registration delays publication](#).

Deaths data sources

This report is based primarily on death registrations, with 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 than registrations 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 at least four days after the end of the month, to allow time for deaths to be registered. Death registrations data for 2020 are provisional; however, we would expect only very small changes to total death registration counts once data are made final. Death occurrences are likely to change, especially for dates towards the end of the current month, as some deaths will not have been registered the extract is taken.

Figures on deaths due to COVID-19 in this publication are different from the daily surveillance figures on COVID-19 deaths published by the Department of Health and Social Care (DHSC) on the [GOV.UK](#) website as figures in this report are derived from the formal process of death registration. More information on the different sources of COVID-19 deaths data is available in [Deaths registered weekly in England and Wales](#).

Monthly mortality rates

We publish the mid-year population estimates used for calculating rates; these are currently available up to 2019. For 2020 onwards, population projections were used.

Calculation of mortality rates for monthly deaths requires adjustments to be made to annual population estimates to calculate rates that are comparable with annual rates. We calculate an annual population centred on the midpoint of the month using two years' worth of population estimates (or where these are not available, population projections). For the first half of the year (January to June), populations for the current year and the previous year are used; for the second half of the year (July to December), populations for the current year and the following year are used.

This is then multiplied by the number of days within the month as a proportion of the total number of days within that year. The output is used as the population denominator in calculations of age-standardised and age-specific mortality rates.

For example:

$$\text{June 2020 population} = \text{population}_{2019}(i) + (\text{population}_{2020} - (\text{population}_{2019}(i) \times (m/M))) \times (N/M)$$

where m is the number of days from 1 July 2019 (the start of the mid-year for the population estimate) to the midpoint of June inclusive, N is the number of days in June 2020, M is the number of days in 2020 and (i) is the age group.

$$\text{June 2020 population} = (\text{population}_{2020}(i) + (\text{population}_{2021} - (\text{population}_{2020}(i) \times (m/M))) \times (N/M)$$

where m is the number of days from 1 July 2019 (the start of the mid-year for the population estimate) to the midpoint of July inclusive, N is the number of days in July 2020, M is the number of days in 2020 and (i) is the age group.

11 . 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 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 are 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.

Further information can be found in the Mortality statistics in England and Wales Quality and Methodology Information (QMI) report and the User guide to mortality statistics.

12 . Related links

[Deaths registered weekly in England and Wales](#)

Bulletin | Released 18 August 2020

Provisional counts of the number of deaths registered in England and Wales, including deaths involving the coronavirus (COVID-19) pandemic, by age, sex and region, in the latest weeks for which data are available.

[Deaths involving COVID-19, England and Wales](#)

Bulletin | Released 17 July 2020

Number of deaths involving the coronavirus (COVID-19) that occurred in each month in England and Wales, by country, age, sex and place of death.

[Deaths registered in England and Wales: 2019](#)

Bulletin | Released 1 July 2020

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.

[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.