Office for National Statistics

Statistical bulletin

Monthly mortality analysis, England and Wales: July 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

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21 August 2020

Next release:
18 September 2020

Correction

18 September 2020 12:39

An incorrect data point was included in Figure 7 for Wales in 2001.

This has now been updated, we apologise for any inconvenience caused.

Table of contents

1 . Main points

- In July 2020, there were 38,179 deaths registered in England, 576 deaths higher than the five-year average (2015 to 2019) for July; in Wales, there were 2,548 deaths registered, 69 deaths higher than the five-year average for July.
- The leading causes of death in July 2020 were dementia and Alzheimer's disease (10.6% of all deaths) in England, and ischaemic heart disease (11.7% of all deaths) in Wales.
- In England, in July 2020, the coronavirus (COVID-19) was the eighth most frequent underlying cause of death, accounting for 2.6% of all deaths (976 deaths); in Wales, COVID-19 did not feature in the top 10 leading causes of death.
- The age-standardised mortality rate of deaths in July due to COVID-19 was 21.0 per 100,000 people in England compared with 16.7 per 100,000 people in Wales; in both England and Wales, the COVID-19 mortality rate continued to decline for the third consecutive month.
- When considering deaths registered in 2020 to date (1 January to 31 July) in England, the age-standardised mortality rate for deaths registered in 2020 was significantly higher than the mortality rate in each year back to 2009.
- Looking at deaths that have occurred so far in 2020 and were registered by 8 August, 330,590 deaths occurred in England (35,123 more than the five-year average for January to July) and 20,967 in Wales (1,096 more than the five-year average).
- In January to July 2020, COVID-19 was the underlying cause of death in 13.7% of all deaths that occurred in England (45,439 deaths) and 10.8% of all deaths in Wales (2,274 deaths).

2 . Introduction

Please note, the number of deaths counted in this release cannot be directly compared with the deaths registered weekly in England and Wales release because weeks do not aggregate exactly into calendar months. Although the number of deaths registered in each separate week of July was below the five-year average for that week of the year, July as a whole saw more deaths registered than the average for that month. This is because July 2020 contained one more weekday (as opposed to weekends) than July in most of the years making up the five-year average, and deaths are usually registered on weekdays, not at weekends when register offices are closed. In July 2020 there were 23 days that occurred on a Monday to Friday compared with 22 days in the five-year average. This one extra registration day in July 2020 has meant that the number of deaths in July 2020 is above the five-year average. On average in July between 2015 and 2019, there were 1,296 deaths registered a day including weekends, and 1,819 registered a day excluding weekends.

This bulletin presents provisional monthly mortality data for England and Wales. Analysis of deaths registered in July 2020 by age and sex, and deaths that occurred in July 2020 by date of death is included. 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 July 2020, there were 54 deaths of non-residents that were registered in England and Wales.

Monthly data on deaths due to the coronavirus (COVID-19) are also presented. This 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 month of death registration, rather than month of death occurrence.

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 have not yet 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.

3 . Death registrations and the overall mortality rate for July 2020

In July 2020, there were 38,179 deaths registered in England. This was 1,435 fewer deaths than in July 2019, and 576 higher than the five-year average (2015 to 2019) for July. Of the deaths registered in July 2020, 19,315 were in males and 18,864 were in females.

In Wales, there were 2,548 deaths registered in July 2020. This was 30 deaths fewer than in July 2019 but 69 deaths higher than the five-year average for July. Of the deaths registered in July in Wales, there were 1,266 male deaths and 1,282 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.

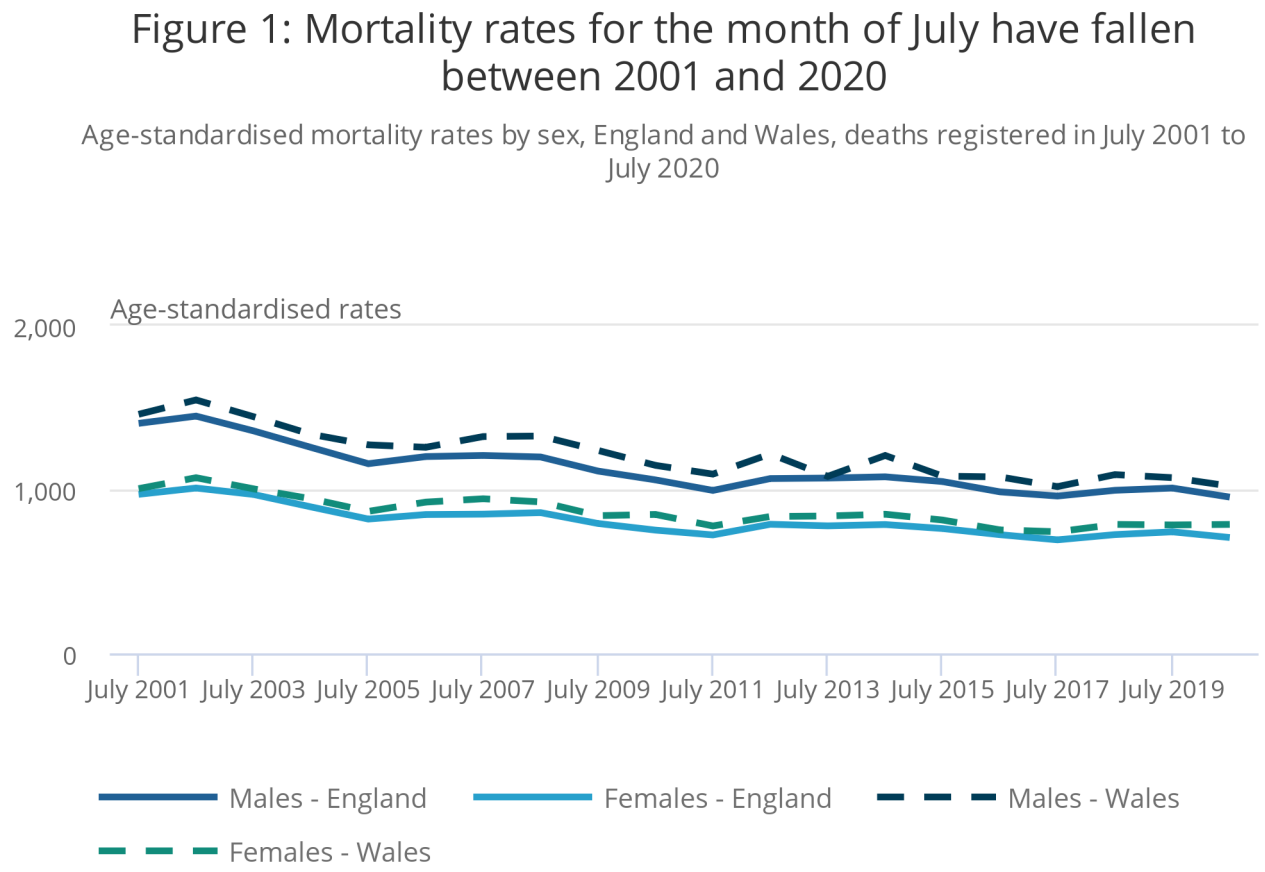
Since July 2001, overall mortality rates in England for the month of July have been decreasing, from 1,147.4 deaths per 100,000 people in 2001, to a low of 820.8 deaths per 100,000 people in July 2020. This statistically significant decline in ASMRs was seen in both males and females (Figure 1).

In July 2020, the mortality rate was 953.6 deaths per 100,000 males (compared with 1,403.7 in July 2001) and 706.9 deaths per 100,000 females (compared with 970.6 in July 2001).

Mortality rates in Wales show a similar pattern over time, decreasing from 1,188.7 deaths per 100,000 people in July 2001, to 895.1 deaths per 100,000 people in July 2020. In July 2020 in Wales, the mortality rate was 1020.8 deaths per 100,000 males (1,459.1 in July 2001) and 786.9 deaths per 100,000 females (1,005.2 in July 2001).

Figure 1: Mortality rates for the month of July have fallen between 2001 and 2020

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



Source: Office for National Statistics - Monthly mortality analysis, England and Wales: July 2020

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 11: 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.

4 . Deaths due to COVID-19 registered in July 2020

Of the 38,179 deaths registered in July 2020 in England, 3.5% (1,320 deaths) involved the coronavirus (COVID-19). In Wales, 2.7% of the 2,548 deaths registered in July involved COVID-19 (70 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.

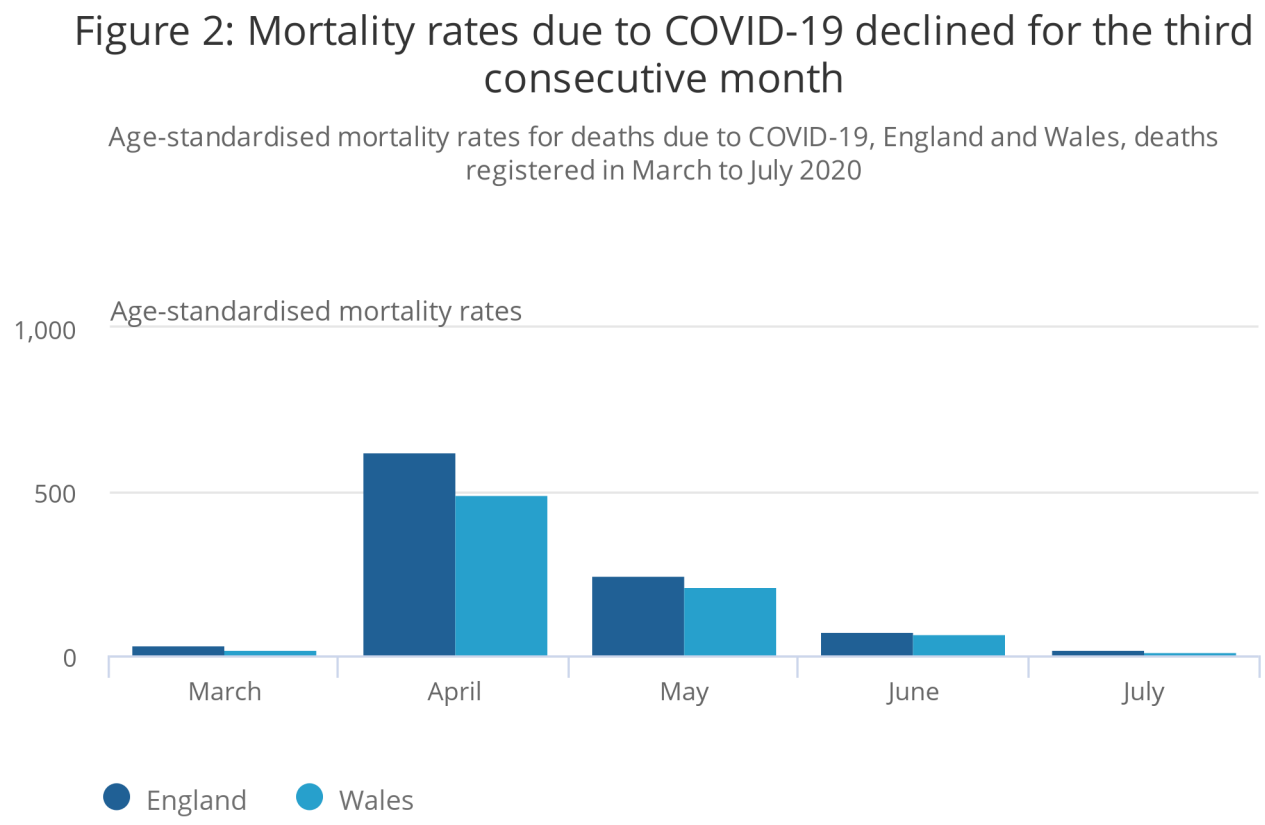
In most cases (92.4% in England and 90.3% in Wales) where COVID-19 was mentioned on the death certificate, it was found to be the underlying cause of death. The analysis of COVID-19 deaths in this bulletin focuses only on deaths where COVID-19 was the underlying cause (deaths "due to" COVID-19). A comparison 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 47,674 deaths with an underlying cause of COVID-19 in England and Wales, 3,864 (8.1%) 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 declined for the third consecutive month

Age-standardised mortality rates for deaths due to COVID-19, England and Wales, deaths registered in March to July 2020



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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 decreased significantly each month since the peak in April 2020 (Figure 2). There were 21.0 deaths due to COVID-19 per 100,000 people in England registered in July 2020, a 96.6% decrease compared with April 2020 (623.2 deaths per 100,000 people). In Wales, the rate of death due to COVID-19 was 16.7 deaths per 100,000 people in July 2020, which was also 96.6% lower than the rate seen in April 2020 (495.1).

In July 2020, the number of deaths and mortality rate due to COVID-19 dropped below levels seen in March 2020 (the first month a COVID-19 death was registered in England and Wales). For England, the mortality rate due to COVID-19 was significantly lower in July than in March 2020, but in Wales the difference was not statistically significant.

5 . Leading causes of death registered in July 2020

The Office for National Statistics' (ONS') 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 July 2020 for England and Wales, compared with the five-year average for July (2015 to 2019).

Figure 3: More than half of the 10 most common leading causes of death were below the five-year average in July 2020

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

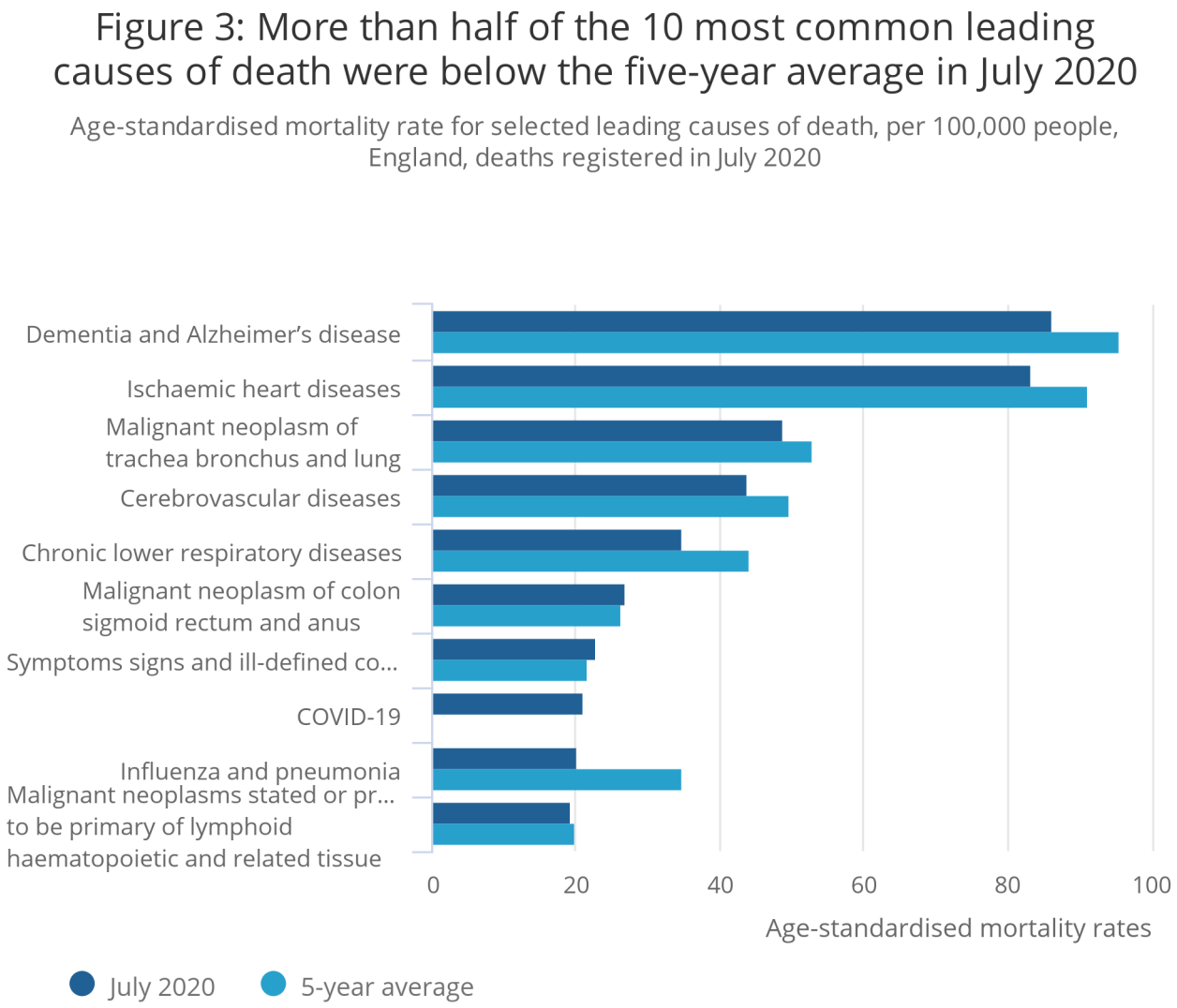

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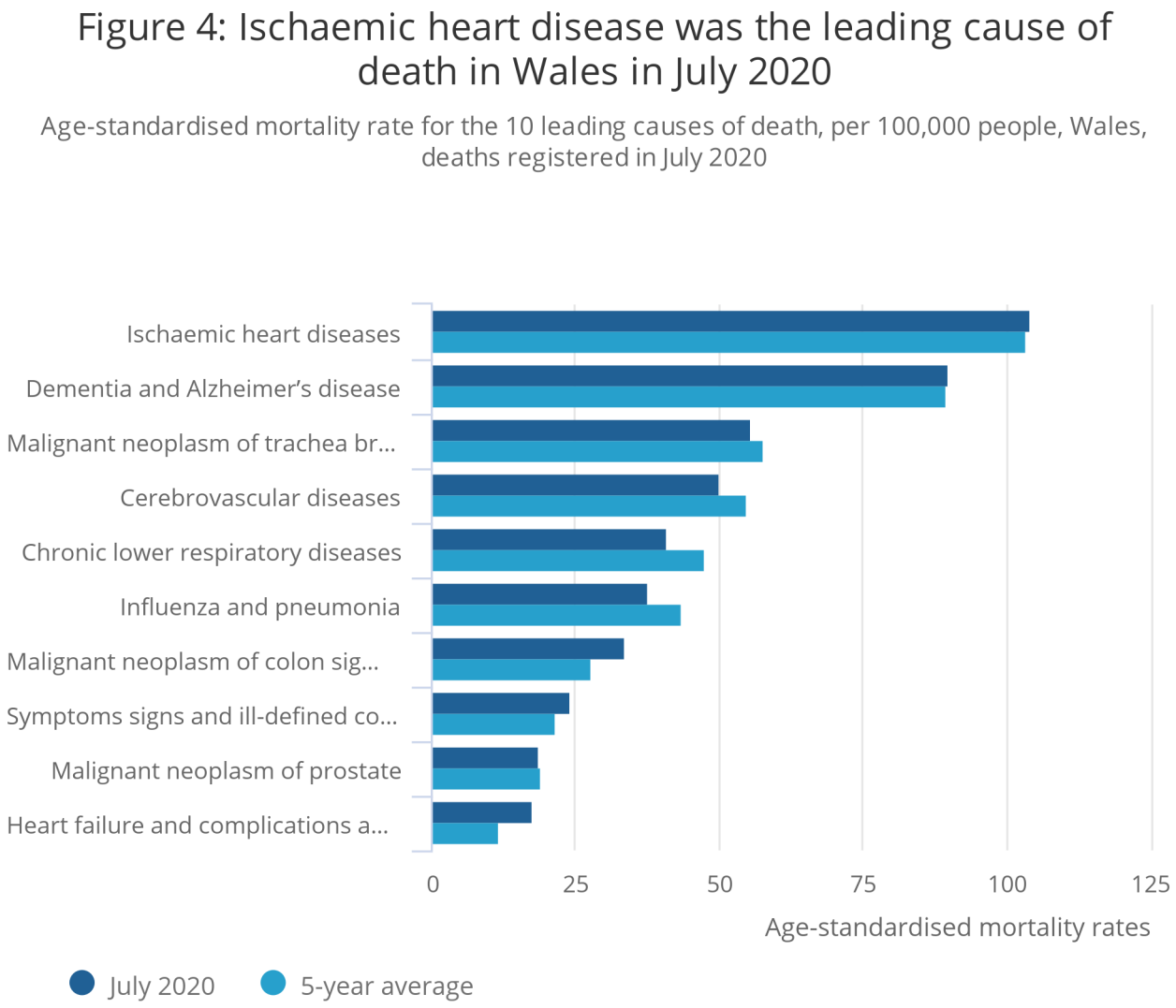
Figure 4: Ischaemic heart disease was the leading cause of death in Wales in July 2020

Age-standardised mortality rate for the 10 leading causes of death, per 100,000 people, Wales, deaths registered in July 2020



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In England, dementia and Alzheimer's disease was the leading cause of death for deaths registered in July 2020, with 86.3 deaths per 100,000 people (4,034 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 (83.3 deaths per 100,000 people, 3,868).

In July 2020, 6 of the 10 leading causes of death were significantly below the five-year average for England (Figure 3). The coronavirus (COVID-19) pandemic resulted in deaths registered in April and May 2020 rising well above what would be expected (based on the five-year average). COVID-19 has had a larger impact on the most vulnerable people (such as those who already suffer from a medical condition), and those at older ages. Some of these deaths would have likely occurred over the duration of the year but have occurred earlier because of COVID-19.

In Wales, ischaemic heart disease was the leading cause of death, with 299 deaths registered in July 2020 (104.1 deaths per 100,000 people). This was followed by dementia and Alzheimer's disease, with 257 deaths (89.9 deaths per 100,000 people). None of the top 10 leading causes of death for Wales were significantly different from the five-year average.

COVID-19 was the eighth highest cause of death in July 2020 for England, but did not feature in the top 10 causes of death for Wales (where is was the thirteenth most common cause of death).

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

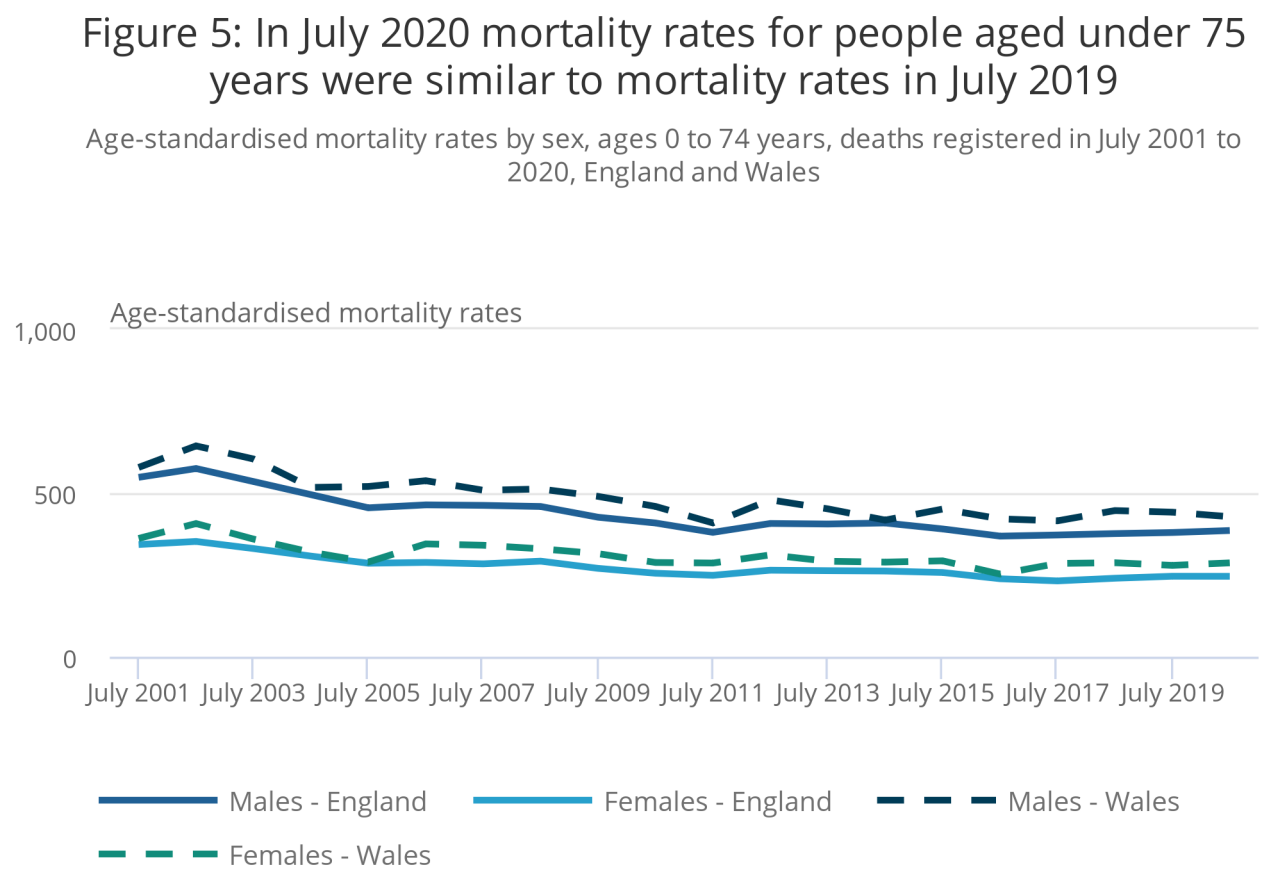
6 . Age-standardised mortality rates, by sex and age group, in July 2020

Most deaths registered typically occur in those who are aged 75 years and over. For this reason, age-standardised mortality rates (ASMRs) 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 ASMRs for people aged 0 to 74 years across both England and Wales have been decreasing. In July 2020, there were 313.8 deaths per 100,000 people in England (440.8 in July 2001) and 355.2 deaths per 100,000 people in Wales (465.0 in July 2001). This decline in mortality rates can be seen in both males and females aged 0 to 74 years (Figure 5).

Figure 5: In July 2020 mortality rates for people aged under 75 years were similar to mortality rates in July 2019

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



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Similar to the mortality trends seen across all age groups, improvements to mortality rates for males and females aged 0 to 74 years have slowed since 2011. ASMRs in July 2020 were not significantly different from July 2019 across males and females in England and Wales.

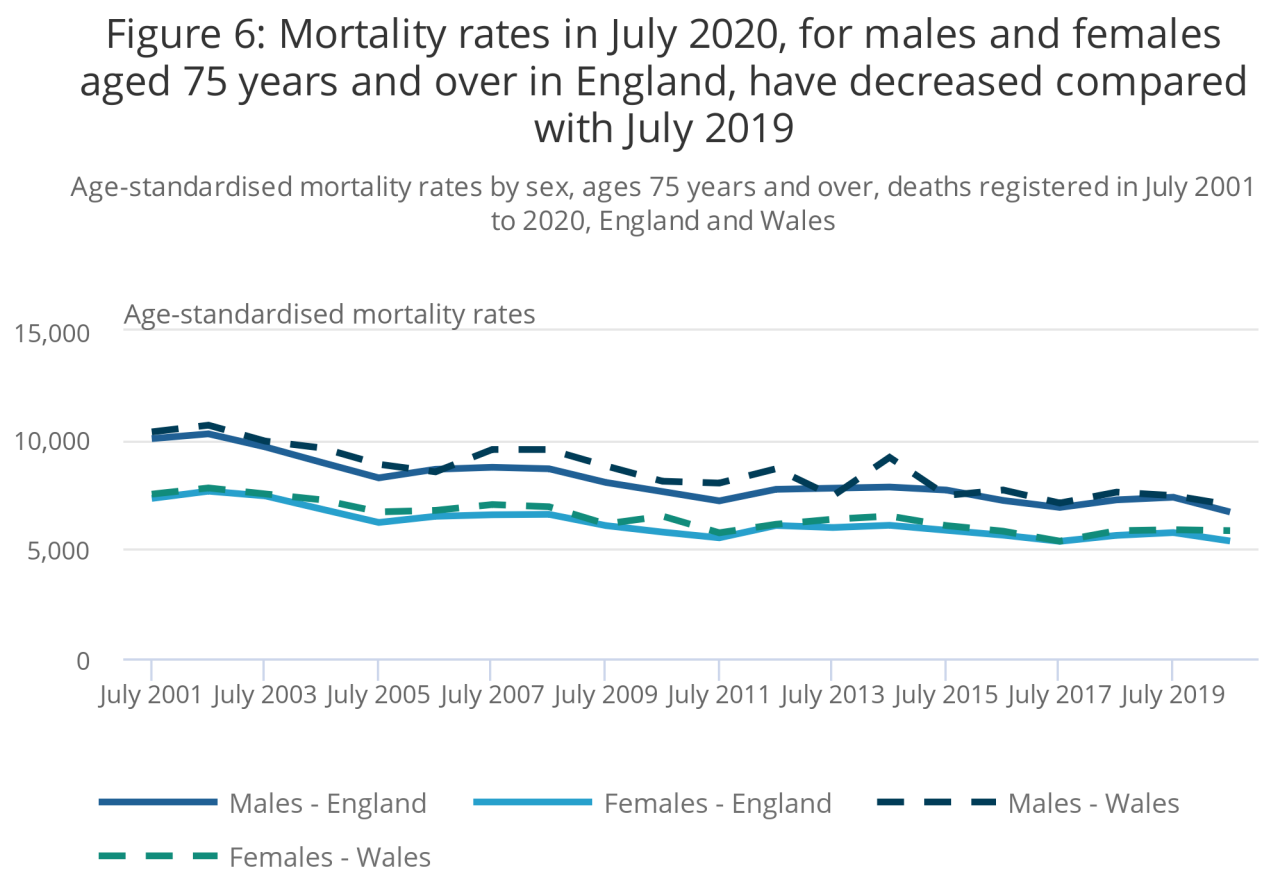
In people aged 75 years and over, mortality rates have also generally improved since 2001 (Figure 6). In July 2020, people aged 75 years and over had a mortality rate of 5,947.1 deaths per 100,000 people in England (8292.5 in July 2001), and 6,354.0 deaths per 100,000 people in Wales (8505.9 in July 2001).

Compared with July 2019, the mortality rate in July 2020 has declined significantly for both males and females aged 75 years and over in England. The ASMR for deaths registered in July 2020 was 7.6% lower than in July 2019. The impact of COVID-19 on the most vulnerable and older people discussed in Section 5 may explain some of the decline compared with 2019.

In Wales, July 2020 mortality rates for people aged 75 years and over decreased compared with July 2019. The age-standardised mortality rate for people aged 75 and over in July 2020 was 5.8% lower in males and 0.7% lower in females than in July 2019. However, neither of these differences were statistically significant.

Figure 6: Mortality rates in July 2020, for males and females aged 75 years and over in England, have decreased compared with July 2019

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



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7 . Deaths registered in the year to date

There were 351,372 deaths registered in England and 22,125 in Wales during the first seven months (January to July) of 2020.

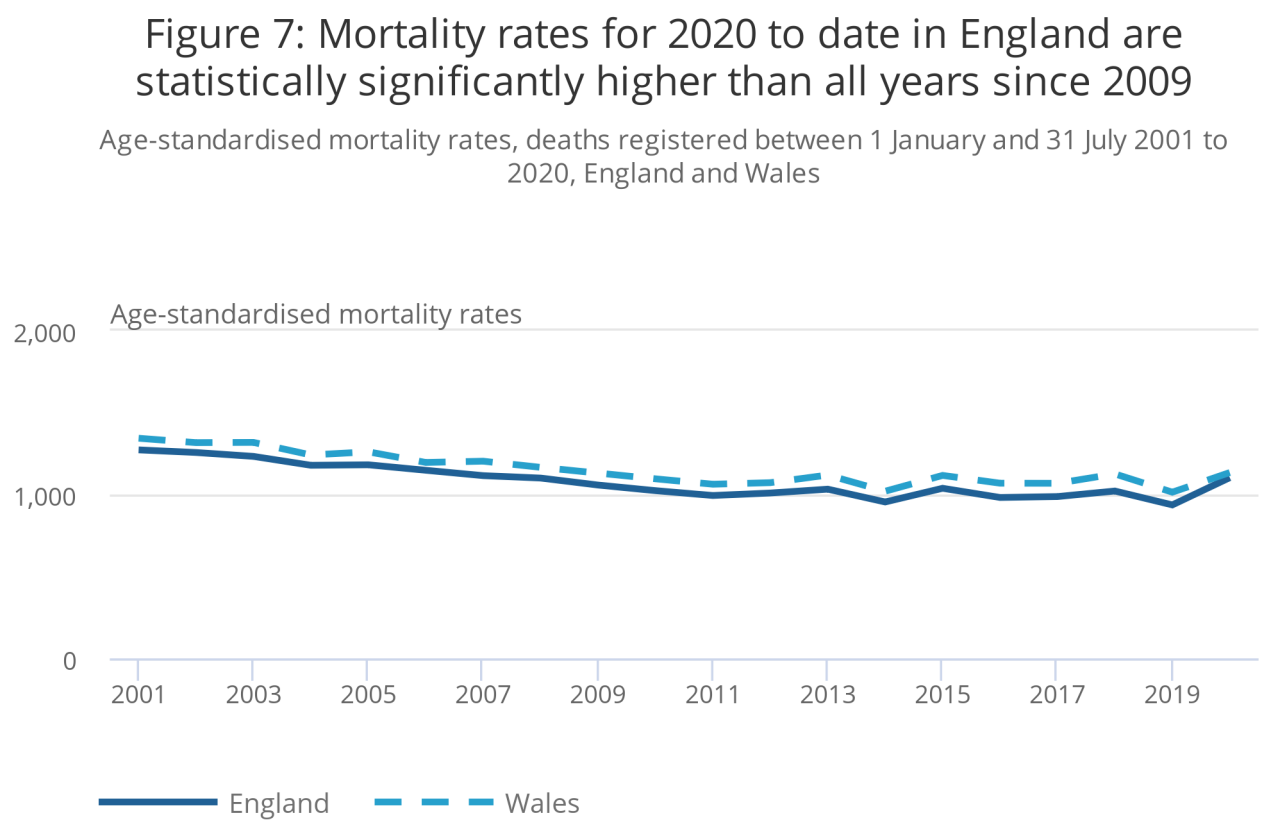
To gain a better idea of year-to-year differences in mortality rates, we calculated year-to-date age-standardised mortality rates (ASMRs) based on deaths registered between 1 January and 31 July in each year from 2001 to 2020 (Figure 7).

For England, the year-to-date ASMR for 2020 was 1,102.9 deaths per 100,000 people, which was statistically significantly higher than all years between 2009 and 2019. For Wales, the year-to-date ASMR for 2020 was 1,134.0 deaths per 100,000 people. This was significantly higher than the first seven months of 2019 (a particularly low year), but not significantly different from 2018.

ASMRs for rolling five-year “seven-month” periods (January to July) are also available in the accompanying dataset. This five-year average removes the volatility that can occur year on year.

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 31 July 2001 to 2020, England and Wales



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8 . Death occurrences in July 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.

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 current death trends. For example, a death registered in July 2020 could have occurred in a previous month or even a previous year. Further information regarding death occurrences and registration delays can be found Section 11: Measuring the data.

Between 1 January and 31 July 2020, 330,590 deaths occurred in England and were registered by 8 August. This was 35,123 more deaths than the five-year average (2015 to 2019) for January to July. Of the 330,590 deaths that occurred, 13.7% were due to the coronavirus (COVID-19) (45,439 deaths). In Wales, 20,967 deaths occurred in 2020 to date, which was 1,096 more deaths than the five-year average. COVID-19 was the underlying cause of death in 10.8% of all deaths that occurred (2,274 deaths).

In England, the first death due to COVID-19 occurred on 2 March 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 16 deaths) until the peak of 1,219 deaths that occurred on 8 April 2020. Since 8 April, the number of deaths each day has been decreasing, with eight deaths due to COVID-19 occurring on 31 July, although the number of recorded deaths on more recent dates will rise as we receive more death registrations.

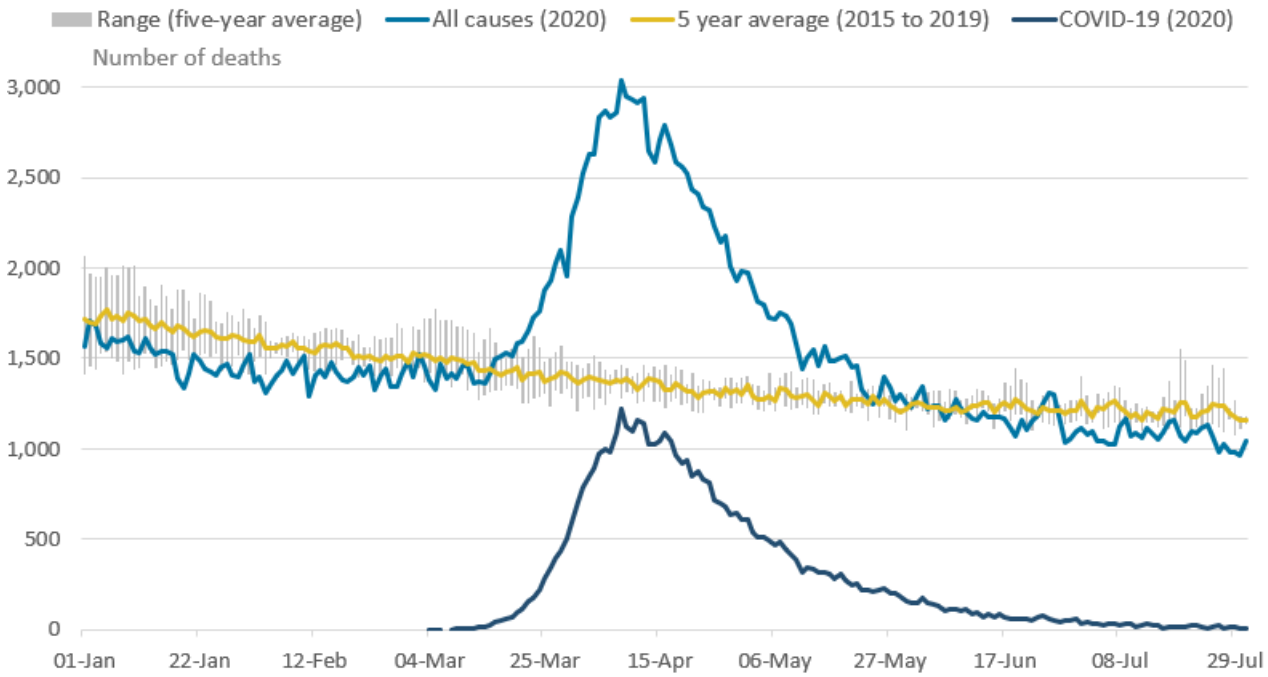
In Wales, the first death with an underlying cause of COVID-19 occurred on 15 March 2020. As in England, the number of COVID-19 deaths per day reached the peak on 8 April 2020, when 70 deaths due to COVID-19 occurred in Wales. Since 8 April, the number of COVID-19 deaths occurring each day in Wales has gradually decreased, with two deaths due to COVID-19 occurring on 31 July (though this may be higher because of registration 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 July 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 been decreasing, following the peak of 1,219 deaths on 8 April 2020

Number of deaths occurring on each day in 2020[1], five-year average and range, England



Source: Office for National Statistics - Monthly mortality analysis, England and Wales: July 2020

Notes:

1. Figures are for deaths occurring on each day rather than deaths registered, registered up to 8 August 2020. Death occurrences will increase as more deaths are registered, particularly for later dates.

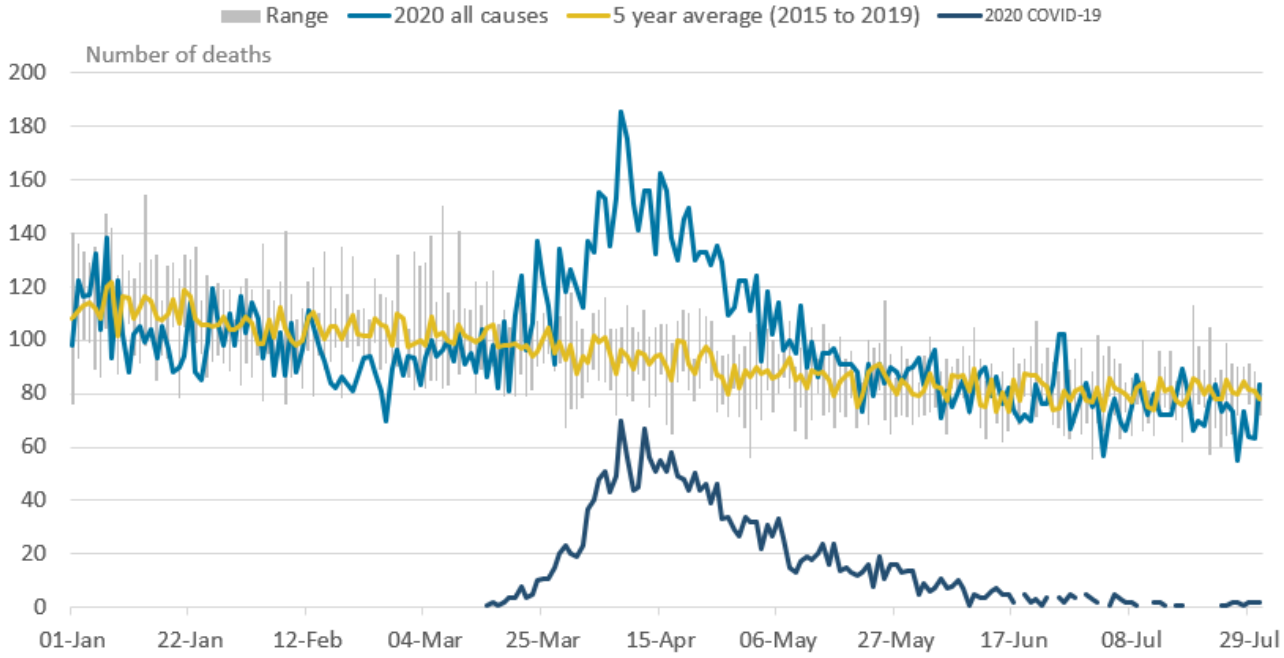
2. The range is the difference between the minimum and maximum value observed on each day during the five-year period (1 January to 31 July 2015 to 2019).

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 2020[1], five-year average and range, Wales



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2. The range is the difference between the minimum and maximum value observed on each day during the five-year period (1 January to 31 July 2015 to 2019).

3. Figures exclude non-residents.

4. For 29 February, only data for leap years are included in the five-year average.

9 . Monthly mortality data

Monthly mortality analysis, England and Wales
Dataset | Released 21 August 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.

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 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 (PDF, 1.19MB).

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

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 the coronavirus (COVID-19) was the underlying cause.

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:

June 2020 population =

$$(\mathrm{population2019(i)} + (\mathrm{population2020} - (\mathrm{population2019(i)} = (\mathrm{m/M})))\mathrm{x}(\mathrm{N/M})$$

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

July 2020 population =

$$(\mathrm{population2020(i)} + (\mathrm{population2021} - (\mathrm{population2020(i)} = (\mathrm{m/M})))\mathrm{x}(\mathrm{N/M})$$

where m is the number of days from 1 July 2020 (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.

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 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(QMI) and the User guide to mortality statistics.

13 . 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), 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.