Office for National Statistics

Article

# Quarterly mortality report, England: July to September 2019

Provisional death registration and death occurrence data for England, broken down by sex and age.

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# 1 . Main points

- In Quarter 3 (July to Sept) 2019, there were 113,348 deaths registered in England; this is 2,247 more deaths than the five-year average (2014 to 2018) for this quarter.

- When taking the size and age of the population into account, the age-standardised mortality rate in Quarter 3 2019 was 831 deaths per 100,000 population.

- Age-standardised mortality rates have fallen from an initial 1,105 deaths per 100,000 population in 2001 to 831 deaths per 100,000 population in 2019.

- When considering deaths registered to date (1 January to 30 September 2019), there has been a significant decrease in age-standardised mortality when compared with 2018; this has been driven by Quarter 1 (Jan to Mar) and Quarter 2 (Apr to June) 2019, which were both statistically significantly lower than their respective quarters for all years since 2001.

- A peak in the number of deaths per day occurred on 25 July 2019, which was the hottest day in 2019.

# 2 . Death registrations in Quarter 3 (July to Sept) 2019

There were 113,348 deaths registered in England in Quarter 3 (July to Sept) 2019. This was 2,997 more deaths than in Quarter 3 2018 and 2,247 more deaths than the five-year average (2014 to 2018) for this quarter. Of the deaths registered in Quarter 3 2019, 57,239 were male and 56,109 were female.

To make valid comparisons over time, we express the number of deaths registered as age-standardised mortality rates. Quarter 3 2019 age-standardised mortality rates were higher than Quarter 3 2018, but this was not statistically significant. However, when compared with 2001, when the data series began, mortality rates have fallen from an initial 1,105 deaths per 100,000 population to 831 deaths per 100,000 population in 2019. The mortality rate for all persons, both males and females, in Quarter 3 2019 was statistically significantly lower than all Quarter 3 periods since 2001, except for Quarter 3 2018.

More information about how mortality rates have changed over a longer time period can be found in Office for National Statistics (ONS) and Public Health England (PHE) analyses of the changing mortality trends in England.
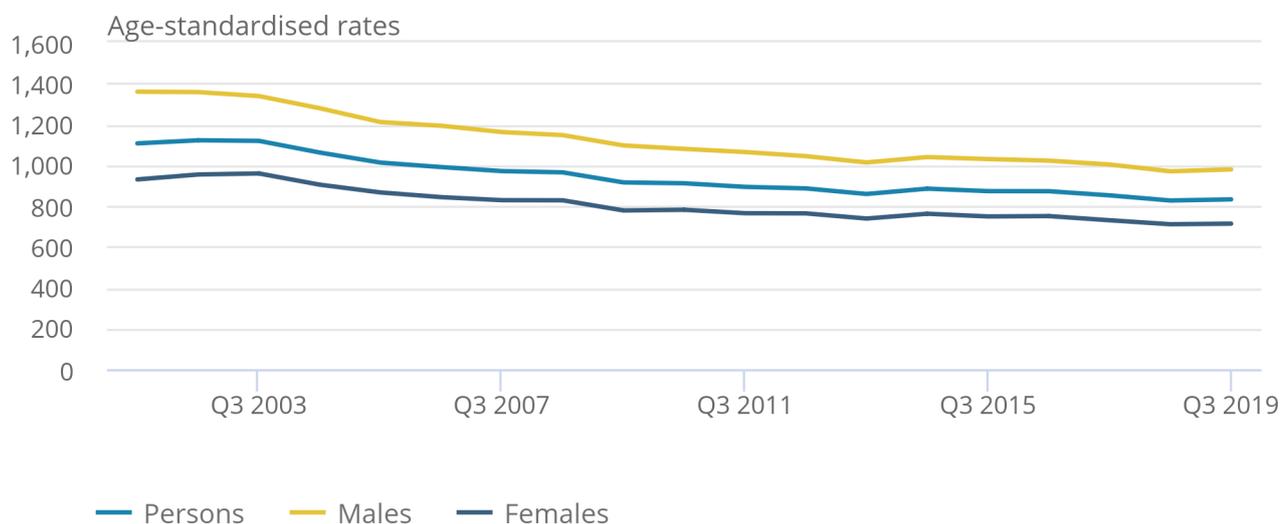
To assess how deaths registered in Quarter 3 2019 compare with earlier years, Figure 1 shows the age-standardised mortality rates for deaths registered in each Quarter 3 between 2001 and 2019.

**Figure 1: Mortality rates in Quarter 3 2019 have fallen since Quarter 3 2001**

**Age-standardised mortality rates by sex, deaths registered in Quarter 3 (July to Sept), 2001 to 2019, England**



Figure 1: Mortality rates in Quarter 3 2019 have fallen since Quarter 3 2001

Age-standardised mortality rates by sex, deaths registered in Quarter 3 (July to Sept), 2001 to 2019, England

**Source: Office for National Statistics – Quarterly mortality report**

**Notes:**

1. Age-standardised mortality rates per 100,000 population, standardised to the 2013 European Standard Population.

2. Q3 refers to Quarter 3 (1 July to 30 September).

3. Figures are for deaths registered rather than deaths occurring in each period.

4. Figures for 2019 are based on provisional mortality data and projected populations.

5. Figures exclude non-residents.

Owing to most deaths occurring in those aged 75 years and over (68% of 2018 registrations), this section separates those aged under 75 years and those aged 75 years and over. We analyse age-standardised rates for those aged 0 to 74 years, followed by age-specific rates for those aged 75 to 79 years, 80 to 84 years, 85 to 89 years, and 90 years and over.

Figure 2 shows a statistically significant decrease in mortality rates for males and females aged 0 to 74 years between 2001 and 2019, with the lowest rates observed in Quarter 3 2019. For all ages, the sharpest falls in mortality rates were in the first half of the period.
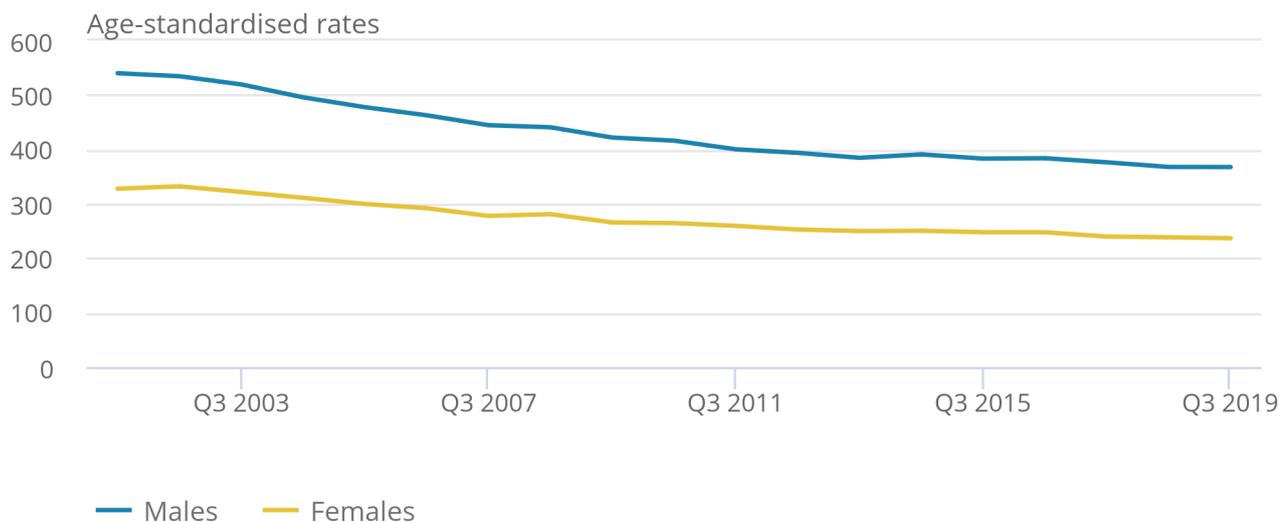
While males aged 0 to 74 years had a higher mortality rate than females (367 deaths per 100,000 males and 236 deaths per 100,000 females), the difference in the mortality rate between males and females has decreased in more recent years.

**Figure 2: Mortality rates in Quarter 3 2019 for ages 0 to 74 years were the lowest since the time series began in 2001**

**Age-standardised mortality rates by sex, deaths registered in Quarter 3 (July to Sept), 2001 to 2019, ages 0 to 74 years, England**

## Figure 2: Mortality rates in Quarter 3 2019 for ages 0 to 74 years were the lowest since the time series began in 2001

Age-standardised mortality rates by sex, deaths registered in Quarter 3 (July to Sept), 2001 to 2019, ages 0 to 74 years, England

Age-standardised rates

— Males  — Females

**Source: Office for National Statistics – Quarterly mortality report**

**Notes:**

1. Age-standardised mortality rates per 100,000 population, standardised to the 2013 European Standard Population.

2. Q3 refers to Quarter 3 (1 July to 30 September).

3. Figures are for deaths registered rather than deaths occurring in each period.

4. Figures for 2019 are based on provisional mortality data and projected populations.

5. Figures exclude non-residents.

Figures 3 and 4 show that since Quarter 3 2001, mortality rates have significantly declined in both males and females for those aged 75 years and over. For males aged 75 to 79 years and 85 to 89 years, age-specific mortality rates in Quarter 3 2019 were the lowest since Quarter 3 2001. For females, those aged 80 to 84 years had the lowest mortality rates since Quarter 3 2001. However, none of these decreases were statistically significant. These were also the only decreases in comparison with Quarter 3 2018.
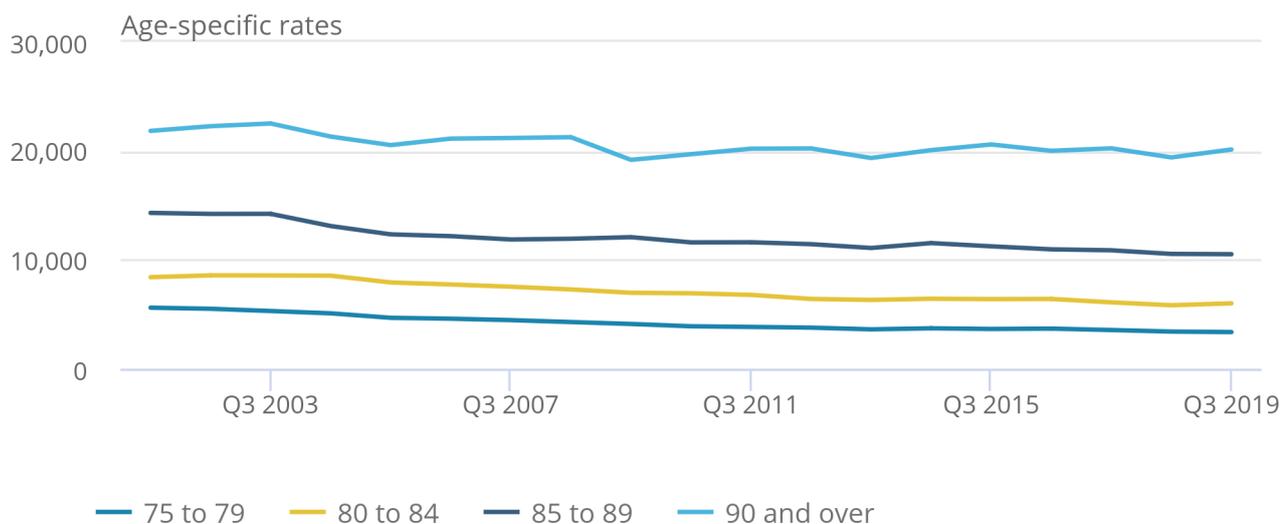
All other age groups saw a non-significant increase in age-specific rates since 2018. For both sexes, age-specific mortality rates at ages 90 years and over have fluctuated year on year since around 2009 without any clear trend.

**Figure 3: Age-specific mortality rates for males aged 75 years and over have decreased since Quarter 3 2001**

**Age-specific mortality rates, deaths registered in Quarter 3 (July to Sept), 2001 to 2019, males aged 75 years and over, England**

## Figure 3: Age-specific mortality rates for males aged 75 years and over have decreased since Quarter 3 2001

Age-specific mortality rates, deaths registered in Quarter 3 (July to Sept), 2001 to 2019, males aged 75 years and over, England



**Source: Office for National Statistics – Quarterly mortality report**
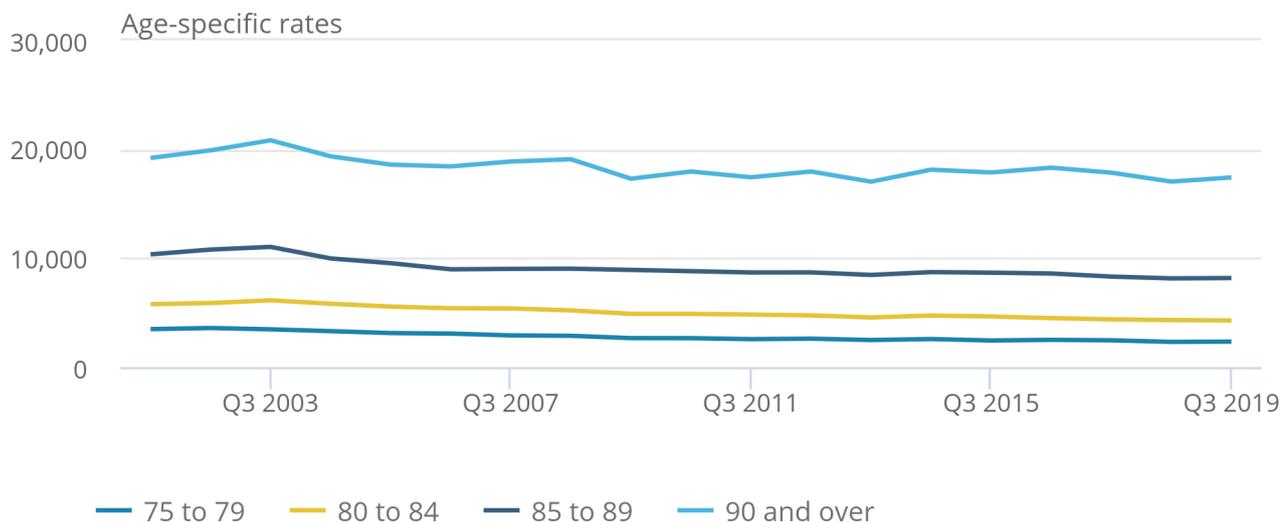
**Notes:**

1. Age-specific mortality rates per 100,000 population.

2. Q3 refers to Quarter 3 (1 July to 30 September).

3. Figures are for deaths registered rather than deaths occurring in each period.

4. Figures for 2019 are based on provisional mortality data and projected populations.

5. Figures exclude non-residents.

**Figure 4: Females aged 80 to 84 years had their lowest age-specific mortality rate since 2001**

**Age-specific mortality rates, deaths registered in Quarter 3 (July to Sept), 2001 to 2019, females aged 75 years and over, England**

Figure 4: Females aged 80 to 84 years had their lowest age-specific mortality rate since 2001

Age-specific mortality rates, deaths registered in Quarter 3 (July to Sept), 2001 to 2019, females aged 75 years and over, England



Age-specific rates

Legend: 75 to 79, 80 to 84, 85 to 89, 90 and over

**Source: Office for National Statistics – Quarterly mortality report**

**Notes:**

1. Age-specific mortality rates per 100,000 population.

2. Q3 refers to Quarter 3 (1 July to 30 September).

3. Figures are for deaths registered rather than deaths occurring in each period.

4. Figures for 2019 are based on provisional mortality data and projected populations.

5. Figures exclude non-residents.

# 3 . Year-to-date death registrations

There were 366,533 deaths registered during the first three-quarters of 2019.

To gain a better idea of year-to-year mortality rates, we calculated year-to-date age-standardised mortality rates based on deaths registered between 1 January and 30 September in each year from 2001 to 2019 (Figure 5). The year-to-date age-standardised mortality rate for 2019 was 910 deaths per 100,000 population, which was statistically significantly lower than all years since 2001 (when the series began).
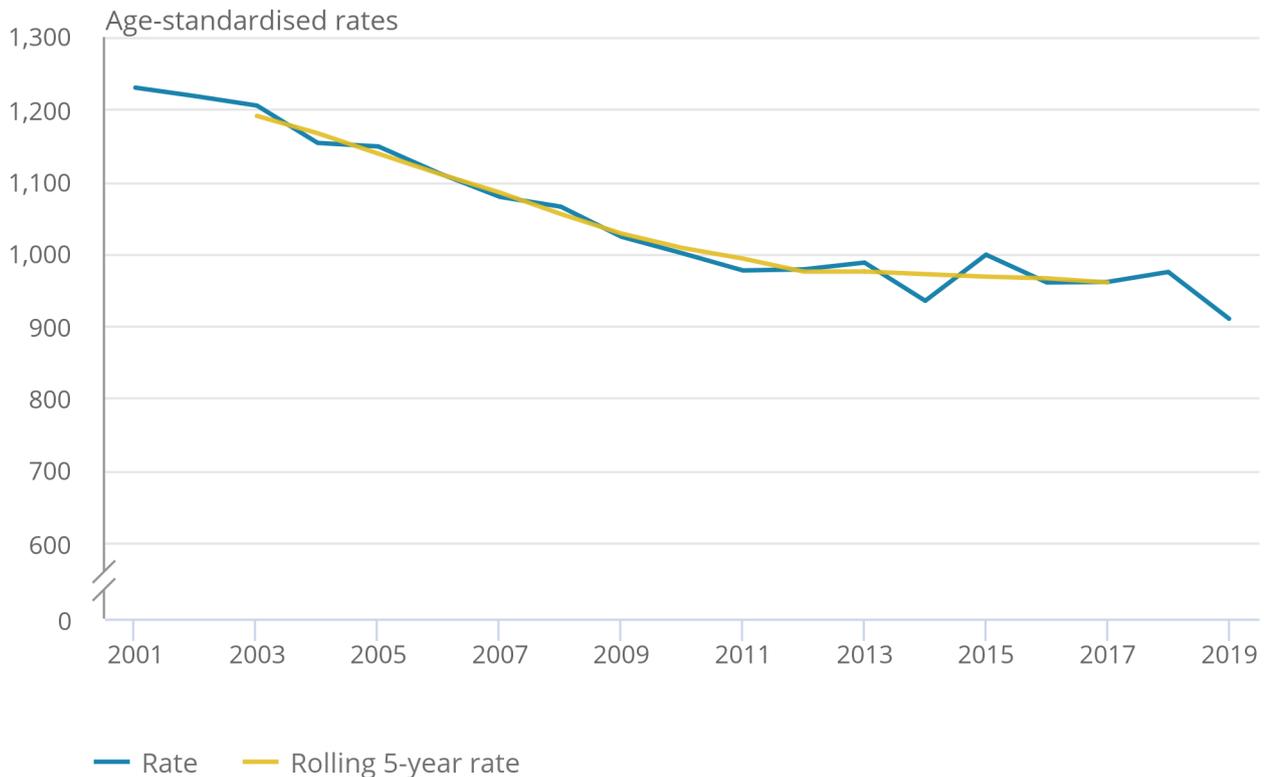
We also created age-standardised mortality rates for rolling five-year "three-quarter" periods. This five-year average removes the volatility that can occur year on year. The year-to-date age-standardised mortality rate for 2019 was lower than expected when compared with the equivalent five-year rolling average, which is the lowest rolling average in the series (Figure 5). The age-standardised mortality rate for 2014 to 2018 was 966 deaths per 100,000 population, which is higher than the 910 deaths per 100,000 population in 2019. The number of deaths for 2019 was 2,342 less than the 2014 to 2018 average.

**Figure 5: Mortality rates for 2019 to date are statistically significantly lower than all years since 2001**

**Age-standardised mortality rates and rolling five-year mid-point age-standardised mortality rates, deaths registered between 1 January and 30 September 2001 to 2019, England**

## Figure 5: Mortality rates for 2019 to date are statistically significantly lower than all years since 2001

Age-standardised mortality rates and rolling five-year mid-point age-standardised mortality rates, deaths registered between 1 January and 30 September 2001 to 2019, England



**Source: Office for National Statistics – Quarterly mortality report**

**Notes:**

1. Age-standardised mortality rates per 100,000 population, standardised to the 2013 European Standard Population.

2. Figures are for deaths registered rather than deaths occurring in each period.

3. Figures for 2019 are based on provisional mortality data and projected populations.

4. Figures exclude non-residents.

5. Rolling 5-year averages are displayed at the midpoint, for instance 2003 denotes 2001 to 2005, 2004 denotes 2002 to 2006 etc.

# 4 . Death occurrences in Quarter 3 (July to Sept) 2019

This section is based on the date a death occurred, rather than the date of registration as in the previous sections, to monitor current mortality trends in England. Analysis on deaths by date of registration is useful as the data are comparable across time and geography. Owing to the length of time that it takes a death to be registered, it can mean that we are not monitoring current death trends. For example, a death registered in Quarter 3 (July to Sept) 2019 could have occurred in a previous quarter or even a previous year. Further information regarding death occurrences and registration delays can be found in the Measuring the data section.

Between 1 July and 30 September 2019, 105,782 deaths occurred in England and were registered by 30 October. This was 4,366 less deaths than the five-year average (2014-2018) for the quarter. It is important to note that the number of death occurrences is incomplete as it is likely more deaths need to be registered, therefore comparisons should be treated with caution.

Figure 6 shows the number of deaths occurring per day in Quarter 3 2019 compared to the five-year average. It also shows the range of death occurrences. This refers to the difference between the lowest and highest numbers of deaths observed on each individual day during Quarter 3 in 2014 to 2018.

There was a peak in the number of deaths per day occurring on 25 July 2019 in England, which was the same day the hottest ever temperature recorded in the UK. More information on heatwave-related deaths can be found in the article, Do summer heatwaves lead to an increase in deaths ?.

Instances where the number of death occurrences on each day 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 quarter may not have been registered by that time. We would therefore expect the number of death occurrences to be higher in future releases.

**Figure 6: There were 105,782 death occurrences in Quarter 3 2019 in England**

**Number of deaths occurring on each day in Quarter 3 (Jul to Sept) 2019[1], five-year average and range, England**
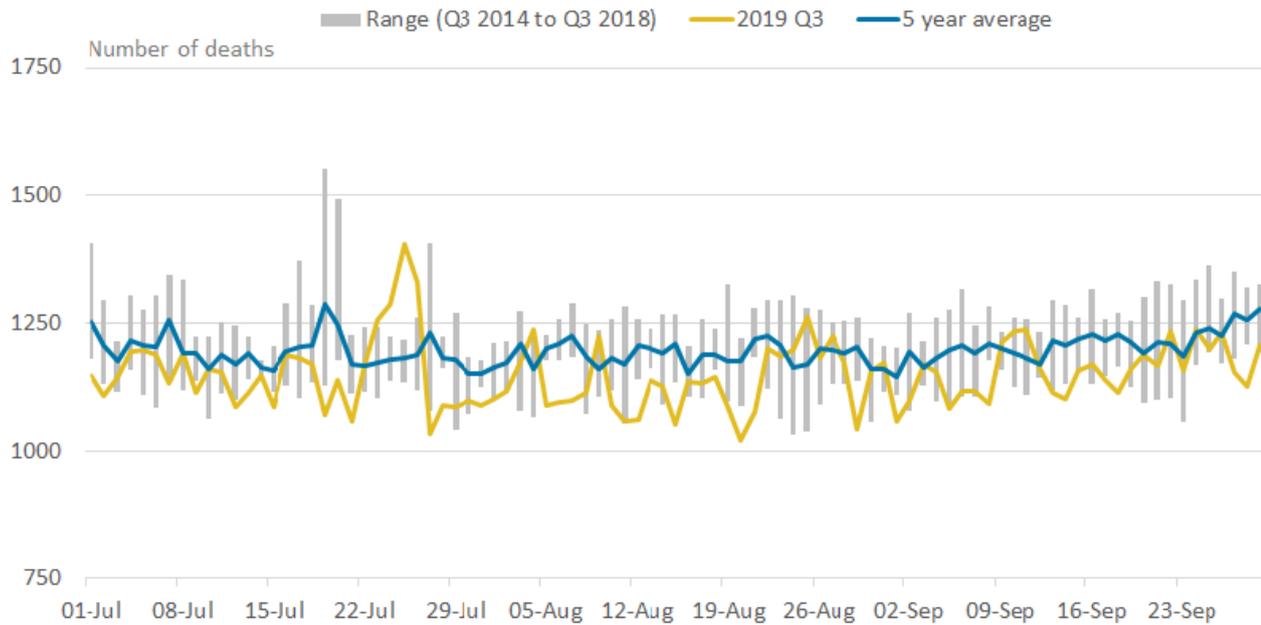


Source: Office for National Statistics – Quarterly mortality report

Notes:

1. Figures are for deaths occurring on each day rather than deaths registered, registered up to 30 October 2019.

2. Q3 refers to Quarter 3 (1 July to 30 September).

3. The range is the difference between the minimum and maximum value observed on each day during the five-year period (Q3 2014 to Q3 2019).

4. Figures exclude non-residents.

# 5 . Quarterly mortality data

Quarterly mortality, England
Dataset | Released 11 December 2019
Quarterly data on death registrations and death occurrences in England, broken down by sex and age.

# 6 . Glossary

## Age-standardised mortality rates

Age-standardised mortality rates are used to allow comparisons between populations, which may contain different proportions of people of different ages. The 2013 European Standard Population is used to standardise rates.

## Age-specific mortality rates

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

## Statistical significance

The term "significant" refers to statistically significant changes or differences. Significance is determined by the 95% confidence intervals, where non-overlapping confidence intervals between figures demonstrate that the difference is unlikely to be a result of random fluctuation. More information is available on the Uncertainty and how we measure it for surveys page.

# 7 . Measuring the data

The purpose of this bulletin is to provide timely surveillance of mortality in England, based on the best available provisional data. This bulletin focuses on Quarter 3 (July to Sept) 2019.

## Deaths data sources

This report is based primarily on death registrations, with a section on death occurrences towards the end of the quarterly overview. 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 for Quarter 3 (1 July to 30 September 2019) was created on 30 October 2019, roughly four weeks after the end of the reporting period.

Death registrations data for 2019 are provisional; however, we would expect only very small changes to total death registration counts once data are made final.

## Registration delays

Previously, death occurrences data have been produced using a similar extraction date to ensure the data were consistent throughout the time period. However, for this release and all future releases, this similar extraction date has been removed to ensure the occurrence data we are publishing are the most up to date. Owing to registration delays, deaths that occurred during Quarter 3 2019 may not have been registered by the 30 September 2019 when the data extract was created. For this reason, the quarterly occurrences data are always somewhat incomplete, and we would expect the number of death occurrences in Quarter 3 2019 reported in future releases to be higher than the number reported here.

The difference between the date a death occurred and the date a death is registered can range between days and years. In 2016, 61.2% of all deaths were registered within five days; when looking at specific causes, this falls to 7.1% for external causes of death. This is because these deaths would have been investigated by a coroner to determine the cause of death, which leads to a delay in registering the death.

## Quarterly populations

We publish the mid-year population estimates used for calculating rates. For 2019, the 2018-based Office for National Statistics (ONS) population projections were used.

Calculation of mortality rates for quarterly deaths requires adjustments to be made to annual population estimates to calculate rates that are comparable with annual rates.

We calculate an annual population centered on the midpoint of the quarter using two years' worth of population estimates or projections. This is then multiplied by the number of days within the quarter 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:

**Quarter 3 2019 population**

$$= (population2018(i) + ((population2019(i) - population2018(i)) * (\frac{m}{M}))) * \left(\frac{N}{M}\right)$$

where m is the number of days from 1 July 2018 (the start of the mid-year for the population estimate) to the midpoint of Quarter 3 inclusive, N is the number of days in Quarter 3 2019, M is the number of days in 2019 and (i) is the age group.

## Early access for quality assurance purposes

We provide early access for quality assurance purposes to a small number of analysts within Public Health England (PHE) and the Department of Health and Social Care (DHSC). The analysts are not permitted to share the findings or the bulletin more widely in their organisations. The bulletin is provided for the analysts to provide technical comment on our findings. However, the ONS independently produces these statistics, including determining the focus, content, commentary, illustration and interpretation of these measures presented, and the comments provided by PHE and the DHSC are purely advisory.

# 8 . 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 and timeliness

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

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.

# 9 . Related links

Changing trends in mortality in England and Wales: 1990 to 2017 (Experimental Statistics)
Article | Released 18 June 2017
Analysis of whether there have been recent changes in the trends of mortality rates in England and Wales from 1990 to 2017.

[Changing trends in mortality: a cross-UK comparison, 1981 to 2016](#)
Article | Released 7 August 2018
Analysis of age-specific and age-standardised mortality rates for the UK, England, Wales, Scotland and Northern Ireland from 1981 to 2016.

[Changing trends in mortality: an international comparison: 2000 to 2016](#)
Article | Released 7 August 2018
Analysis of period life expectancies and mortality in selected countries globally from 2000 to 2016.

[A review of recent trends in mortality in England](#)
Report | Released 11 December 2018
A report on recent trends in life expectancy and mortality in England.

[Excess winter mortality in England and Wales: 2017 to 2018 (provisional) and 2016 to 2017 (final)](#)
Bulletin | Released 30 November 2018
More people die in the winter than the summer. We present data by sex, age, region and cause of death.

[Deaths registered in England and Wales:2018](#)
Bulletin | Released 6 August 2019

Registered deaths by age, sex, selected underlying causes of death, and the leading causes of death for both males and females.