

Statistical bulletin

# Deaths due to coronavirus (COVID-19) compared with deaths from influenza and pneumonia, England and Wales: deaths occurring between 1 January and 31 August 2020

Comparison of deaths from the coronavirus (COVID-19) with deaths from influenza (flu) and pneumonia. Includes deaths by date of death occurrence and breakdowns by sex and age.

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# 1 . Main points

- Of all death occurrences between January and August 2020, there were 48,168 deaths due to the coronavirus (COVID-19) compared with 13,619 deaths due to pneumonia and 394 deaths due to influenza.
- Influenza and pneumonia was mentioned on more death certificates than COVID-19, however COVID-19 was the underlying cause of death in over three times as many deaths between January and August 2020.
- The highest number of deaths due to influenza and pneumonia occurred in January 2020, however influenza and pneumonia deaths were below the five-year average (2015 to 2019) in every month.
- Deaths due to COVID-19 were higher than deaths due to influenza and pneumonia between March and June.
- Age-standardised and age-specific mortality rates for deaths due to COVID-19 were statistically significantly higher than mortality rates due to influenza and pneumonia when compared with the five-year average and 2020 rates.
- The proportion of deaths occurring in care homes due to COVID-19 was almost double the proportion of deaths due to influenza and pneumonia (30.0% and 15.2% respectively).
- In comparison with the deaths due to influenza and pneumonia occurring in the year to 31 August 2020, deaths due to COVID-19 have been higher than every year monthly data are available (1959 to 2020).

## Statistician's comment

"More than three times as many deaths were recorded between January and August this year where COVID-19 was the underlying cause compared to influenza and pneumonia."

"The mortality rate for COVID-19 is also significantly higher than influenza and pneumonia rates for both 2020 and the five-year average."

"Since 1959, which is when ONS monthly death records began, the number of deaths due to influenza and pneumonia in the first eight months of every year have been lower than the number of COVID-19 deaths seen, so far, in 2020."

Sarah Caul, Head of Mortality Analysis

## 2 . Death occurrences due to COVID-19, influenza and pneumonia

This article compares deaths due to the coronavirus (COVID-19) with those due to influenza and pneumonia in the same period. Influenza and pneumonia are relatively well-understood causes of death involving respiratory infection and are likely to have somewhat similar risk factors to COVID-19. There is public interest in how deaths from these causes are similar and how they differ. We often count "influenza and pneumonia" together because many cases of pneumonia are in fact caused by influenza.

When deaths are registered in England and Wales, 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](#).

The analysis of COVID-19, influenza and pneumonia deaths in this bulletin focuses on deaths where these conditions were the underlying cause of death (deaths “due to”), rather than deaths where the conditions were either the underlying cause or mentioned as a contributing factor (deaths “involving”). Data for deaths where COVID-19, influenza and pneumonia were a contributing factor are available in the [accompanying dataset](#).

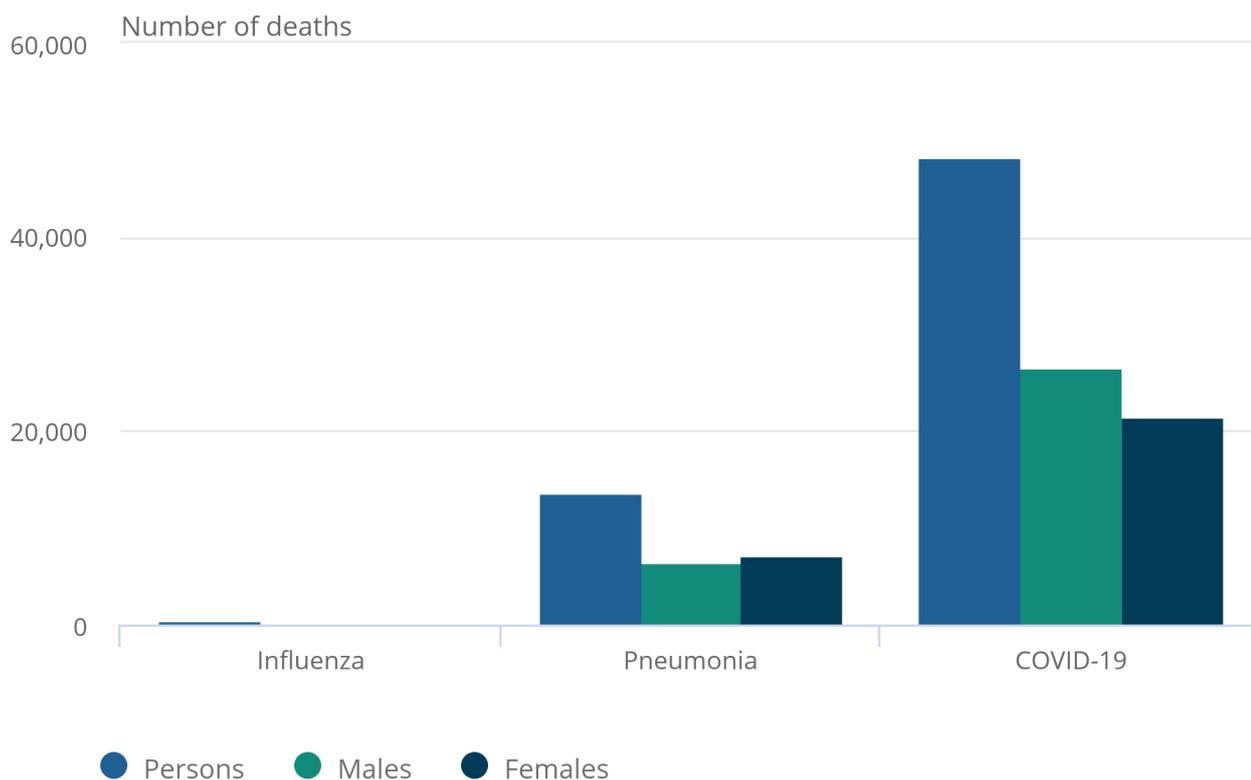
This bulletin uses death occurrences (based on date a death occurred) rather than death registrations (based on date a death was registered), as occurrences are more useful in examining trends over time. However, some deaths can take months (or occasionally years) to be registered, so there may be some deaths that occurred between January and August 2020 that are not yet registered. More information on this issue can be found in our [Impact of registration delays release](#).

## Figure 1: There were more deaths due to COVID-19 between January and August 2020 than influenza or pneumonia

Number of deaths due to influenza, pneumonia or COVID-19 by sex, England and Wales, occurring between 1 January and 31 August 2020 and registered by 5 September 2020

### Figure 1: There were more deaths due to COVID-19 between January and August 2020 than influenza or pneumonia

Number of deaths due to influenza, pneumonia or COVID-19 by sex, England and Wales, occurring between 1 January and 31 August 2020 and registered by 5 September 2020



Source: Office for National Statistics

#### Notes:

1. Figures include deaths of non-residents.
2. Based on date a death occurred, registered up to 5 September 2020.
3. All figures for 2020 are provisional.
4. The International Classification of Diseases, tenth edition (ICD-10) definitions are as follows: coronavirus (COVID-19) (U07.1 and U07.2), influenza (J09-J11) or pneumonia (J12-J18).

Between 1 January and 31 August 2020, 52,327 deaths in England and Wales involved COVID-19. Out of these, 48,168 deaths were due to COVID-19: that is, COVID-19 was the underlying cause. This was 12.4% of all deaths for the period (389,835 deaths). In the same period 69,781 deaths involved pneumonia and 506 deaths involved influenza: out of these, 13,619 and 394 deaths were due to pneumonia and influenza respectively (3.5% and 0.1% of all deaths).

Therefore, there were 1.3 times as many deaths where influenza or pneumonia was a contributory factor than COVID-19, but COVID-19 was the underlying cause in 3.4 times as many deaths.

Of the deaths where both influenza and pneumonia, and COVID-19 were mentioned on the death certificate, the underlying cause of death was COVID-19 in 95.8% (18,642 deaths) of cases. This is compared with 0.04% (eight deaths) of deaths where influenza and pneumonia were the underlying cause of death.

There were more deaths due to influenza or pneumonia in females than males (Figure 1), however deaths due to COVID-19 were 23.7% higher in males than females. The same patterns were observed in England and Wales separately, with deaths due to COVID-19 being 24.0% higher in males in England and 17.4% higher in Wales. Because of the small numbers of influenza deaths, and the known link between influenza and pneumonia, we have combined influenza and pneumonia in the rest of this bulletin.

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.

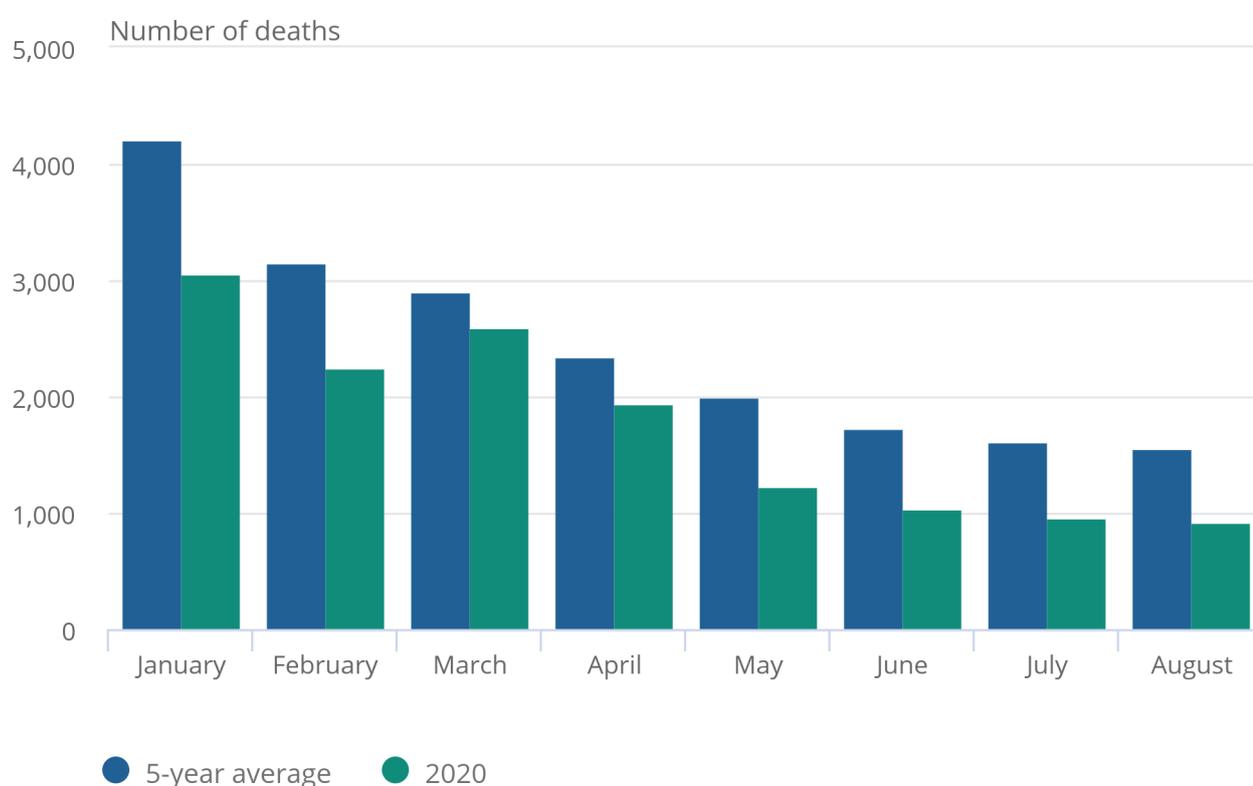
### 3 . Death occurrences in 2020 and five-year averages for influenza and pneumonia

**Figure 2: In 2020 deaths due to influenza and pneumonia were consistently lower than the five-year average in all months from January to August**

Number of deaths due to influenza and pneumonia by month of occurrence, England and Wales, occurring between 1 January and 31 August 2020 and registered by 5 September 2020

Figure 2: In 2020 deaths due to influenza and pneumonia were consistently lower than the five-year average in all months from January to August

Number of deaths due to influenza and pneumonia by month of occurrence, England and Wales, occurring between 1 January and 31 August 2020 and registered by 5 September 2020



Source: Office for National Statistics

Notes:

1. Figures include deaths of non-residents.
2. Based on date a death occurred, registered up to 5 September 2020.
3. All figures for 2020 are provisional.
4. The International Classification of Diseases, tenth edition (ICD-10) definitions are as follows: influenza and pneumonia (J09-J18).

Death occurrences due to influenza and pneumonia in 2020 were lower than the five-year average (2015 to 2019) for every month between January and August (Figure 2). As in most years, the highest number of deaths due to influenza and pneumonia occurred in January, with 3,067 deaths in 2020. However, January 2020 also saw the largest difference from the five-year average of any month, with 1,151 deaths less than the average.

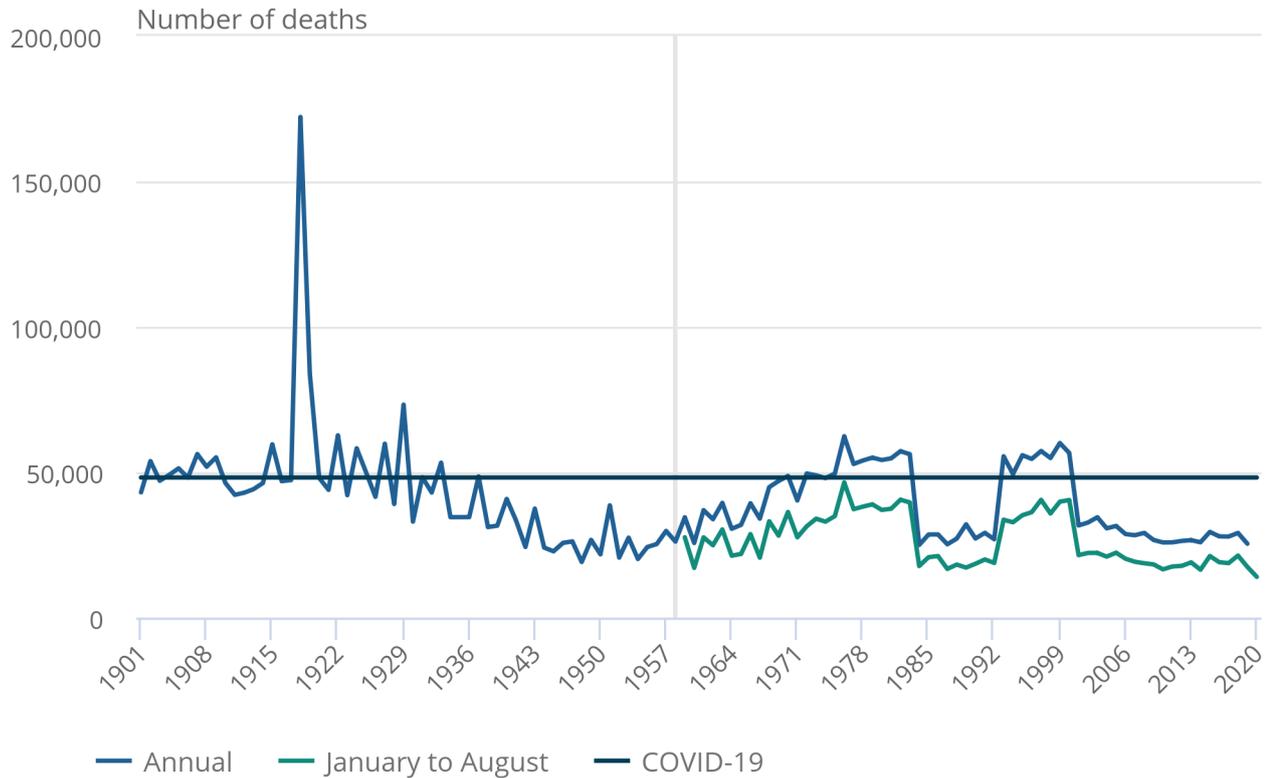
**Figure 3: The number of deaths due to COVID-19 was higher than the number of deaths due to influenza and pneumonia in every year since 2000**

Number of deaths due to influenza and pneumonia or COVID-19 by year and year to date England and Wales, 1901 to 2020

Figure 3: The number of deaths due to COVID-19 was higher than the number of deaths due to influenza and pneumonia in every year since 2000

Nur  
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Number of deaths due to influenza and pneumonia or COVID-19 by year and year to date England and Wales, 1901 to 2020



Source: Office for National Statistics

Notes:

1. Figures include deaths of non-residents.
2. Deaths between 1901 and 1958 are based on date a death was registered rather than occurred.
3. Deaths between 1959 and 2020 are based on date a death occurred rather than registered, registered up to 5 September 2020.
4. All figures for 2020 are provisional.
5. The International Classification of Diseases (ICD): [ICD 1 to 9 codes available](#) : ICD-10: influenza and pneumonia (J09-J18), coronavirus (COVID-19) (U07.1 and U07.2)

Looking back at the number of deaths due to influenza and pneumonia between 1901 and 2019, 1948 was the year with the fewest deaths, when 19,128 deaths were registered. The number of deaths due to influenza and pneumonia has fluctuated over time but this has been stable since 2001.

The widespread flu vaccination was introduced in the UK in 2000; more information regarding this has been published by [Public Health England in the Immunisation against infectious disease. The Green Book, Chapter 19: Influenza. \(PDF, 138KB\)](#). Between 2001 and 2019, the year with the highest number of deaths was 2003 (34,496 deaths) and the year with the lowest number of deaths was 2019 (25,406 deaths).

Since 1901, the year with the highest number of deaths was 1918 when there were 172,149 deaths due to influenza and pneumonia (Figure 3). 1918 was the year the pandemic known as the “Spanish flu” occurred. There were also influenza pandemics in 1957 (known as the “Asian flu”) and 1969 (known as the “Hong Kong flu”). These years also saw a rise in the number of deaths (29,788 and 46,966 deaths respectively) but the increase was not as large as in 1918.

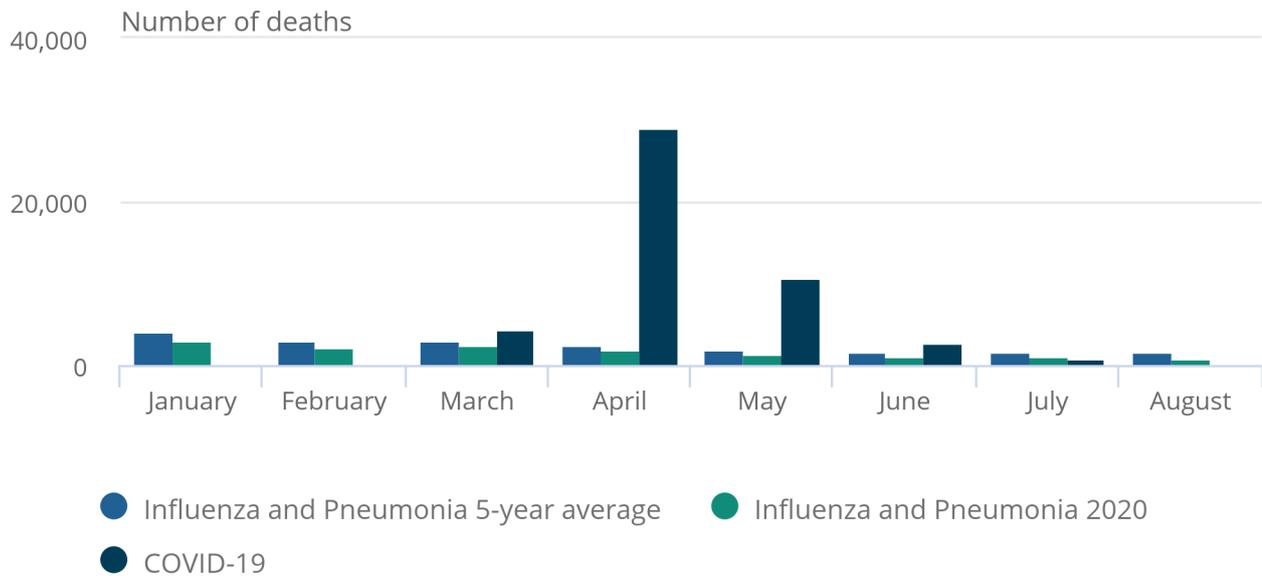
Comparing the number of deaths due to the coronavirus (COVID-19) with the time series of deaths due to influenza and pneumonia, deaths due to COVID-19 (48,168 deaths) are higher than every year since 2000 (56,623 deaths). This is when comparing COVID-19 with the number of deaths occurring across a calendar year, whereas the deaths due to COVID-19 are those occurring between 2 March 2020 and 31 August 2020. In comparison with the deaths due to influenza and pneumonia occurring in the year to 31 August, COVID-19 has been higher than every year for which monthly data is available (1959 to 2020).

**Figure 4: The number of deaths due to COVID-19 was higher than the number of deaths in 2020 and the five-year average for deaths due to influenza and pneumonia**

Number of deaths due to influenza and pneumonia or COVID-19 by month of occurrence, England and Wales, occurring between 1 January and 31 August 2020 and registered by 5 September 2020

Figure 4: The number of deaths due to COVID-19 was higher than the number of deaths in 2020 and the five-year average for deaths due to influenza and pneumonia

Number of deaths due to influenza and pneumonia or COVID-19 by month of occurrence, England and Wales, occurring between 1 January and 31 August 2020 and registered by 5 September 2020



Source: Office for National Statistics

Notes:

1. Figures include deaths of non-residents.
2. Based on date a death occurred, registered up to 5 September 2020.
3. All figures for 2020 are provisional.
4. The International Classification of Diseases, tenth edition (ICD-10) definitions are as follows: coronavirus (COVID-19) (U07.1 and U07.2), influenza and pneumonia (J09-J18).

The number of deaths per month due to COVID-19 between March and June 2020 was higher than the number of deaths due to influenza and pneumonia, and also higher than the five-year average for influenza and pneumonia (Figure 4). In July and August, the number of deaths due to COVID-19 was lower than deaths due to influenza and pneumonia.

The highest number of deaths due to COVID-19 occurred in April 2020 (29,128 deaths) and was over 10 times larger than deaths due to influenza and pneumonia in April 2020 and the five-year average (1,933 and 2,355 deaths respectively).



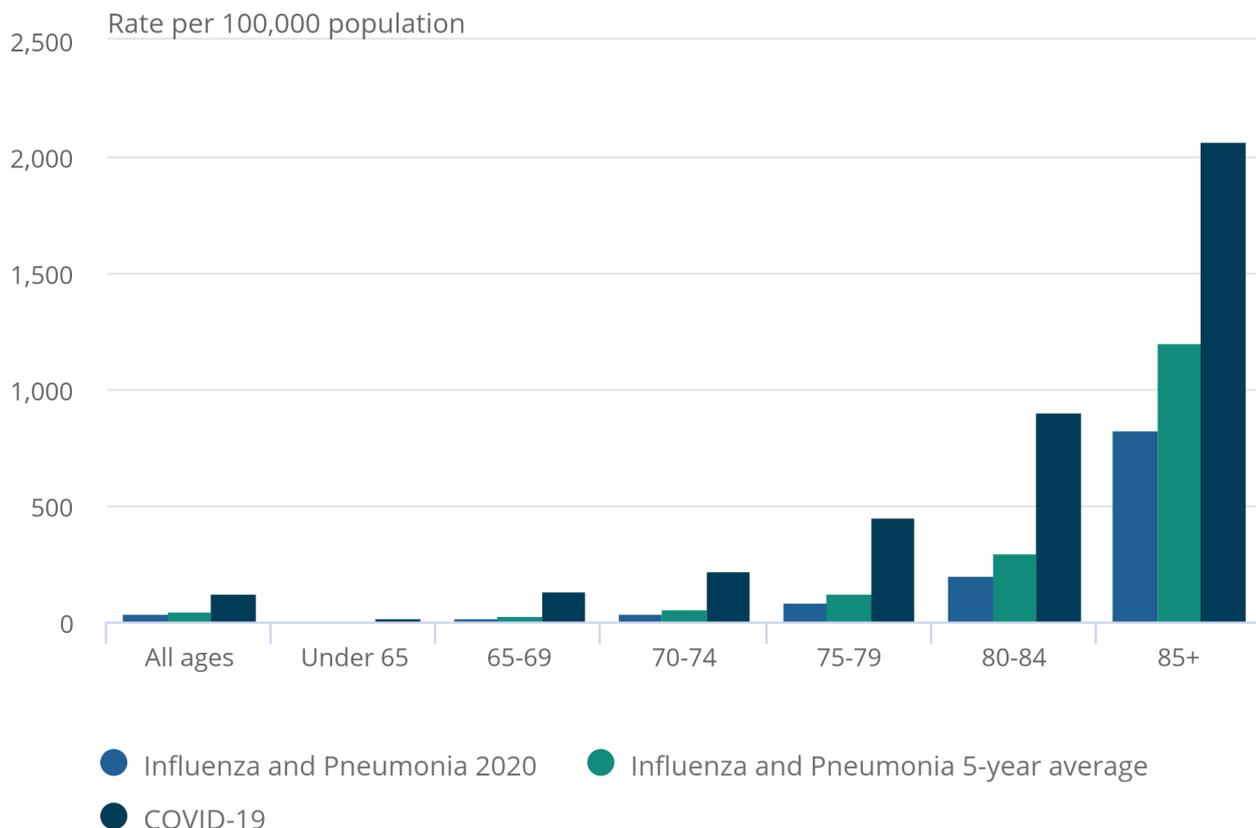
# 4 . Age-standardised and age-specific rates for deaths due to influenza and pneumonia and COVID-19

**Figure 5: COVID-19 mortality rates were higher than influenza and pneumonia rates for 2020 and the five-year average for all age groups in England**

Age-standardised and age-specific mortality rates for deaths due to influenza and pneumonia, and COVID-19, England, occurring between 1 January and 31 August 2020 and registered by 5 September 2020

Figure 5: COVID-19 mortality rates were higher than influenza and pneumonia rates for 2020 and the five-year average for all age groups in England

Age-standardised and age-specific mortality rates for deaths due to influenza and pneumonia, and COVID-19, England, occurring between 1 January and 31 August 2020 and registered by 5 September 2020



Source: Office for National Statistics

Notes:

1. Figures exclude deaths of non-residents.
2. Figures are based on boundaries as of May 2020.
3. Based on date a death occurred, registered up to 5 September 2020.
4. Figures for 2020 are based on provisional mortality data and projected populations.
5. The International Classification of Diseases, tenth edition (ICD-10) definitions are as follows: coronavirus (COVID-19) (U07.1 and U07.2), influenza and pneumonia (J09-J18).
6. Age-standardised mortality rates (ASMRs) per 100,000 population, standardised to the 2013 European Standard Population for all ages and under 65 years. For more information, see [Section 8: Measuring the data](#).

The following analysis of rates of death and place of occurrence will focus on England and Wales separately. This allows for any difference in trends between the two countries to be identified.

In 2020, age-standardised and age-specific mortality rates for deaths due to influenza and pneumonia were statistically significantly lower than the five-year average for all age groups in England. People aged 85 years and over had the highest age-specific mortality rates, with 824.4 and 1,205.8 deaths per 100,000 people for 2020 and the five-year average respectively. These rates were statistically significantly higher than all other age groups.

The largest absolute difference in influenza and pneumonia mortality rates between 2020 and the five-year average was for those aged 85 years and over, with a difference of 381.4 deaths per 100,000 people. However, the largest percentage change was found in those aged between 75 and 79 years, with rates in 2020 being 33.8% lower than the five-year average.

Age-standardised and age-specific mortality rates for deaths due to the coronavirus (COVID-19) were statistically significantly higher for all age groups compared with rates for deaths due to influenza and pneumonia for 2020 and the influenza and pneumonia five-year average.

Similar to deaths caused by influenza and pneumonia, people aged 85 years and over had the highest age-specific mortality rate from COVID-19, with 2,068.3 deaths per 100,000 people, which was statistically significantly higher than all other age groups.

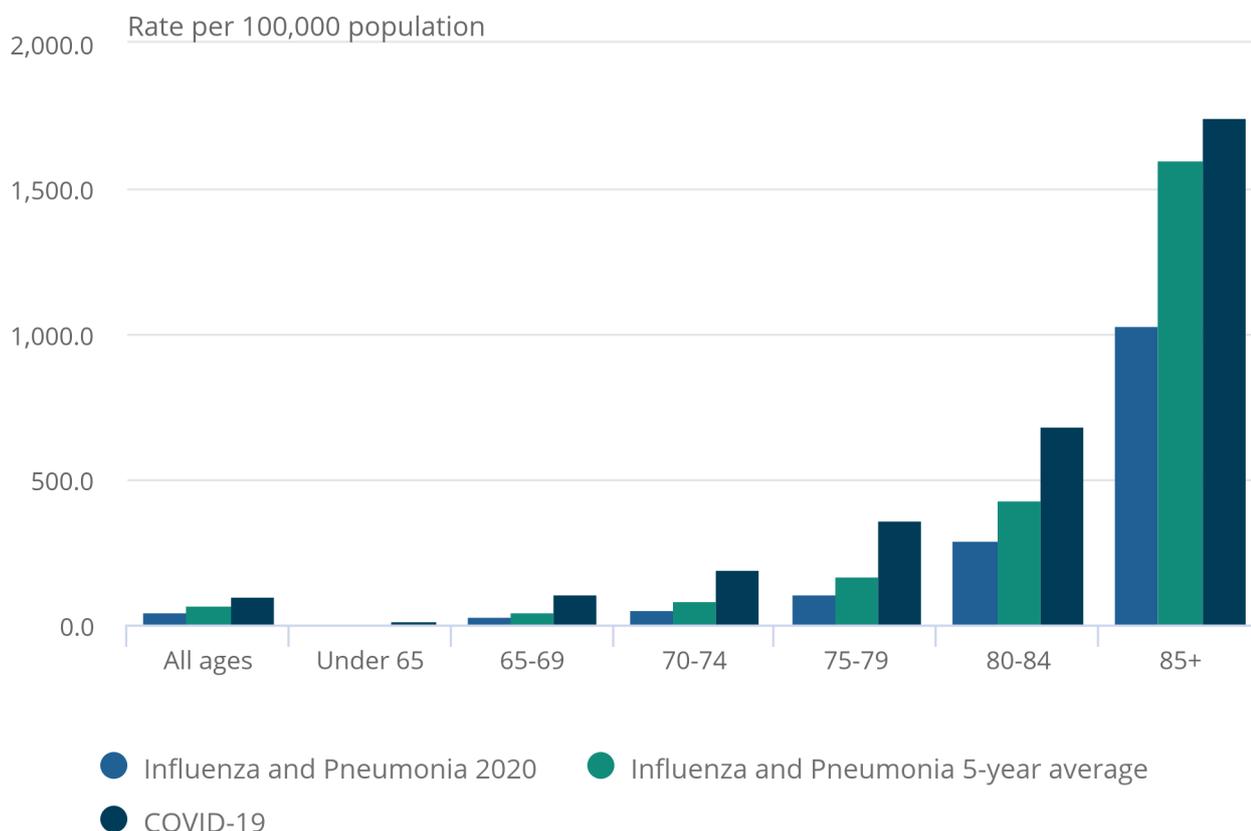
The largest absolute difference in rates between COVID-19 and influenza and pneumonia deaths was observed in those 85 years and over, where the COVID-19 mortality rate was 1,243.9 deaths per 100,000 people higher than the influenza and pneumonia rate in 2020, and 862.5 deaths per 100,000 people higher than the five-year average.

**Figure 6: People aged 85 years and over had statistically significantly higher rates than all other age groups for deaths due to influenza and pneumonia and COVID-19 in Wales**

Age-standardised and age-specific mortality rates for deaths due to influenza and pneumonia and COVID-19, Wales, occurring between 1 January and 31 August 2020 and registered by 5 September 2020

Figure 6: People aged 85 years and over had statistically significantly higher rates than all other age groups for deaths due to influenza and pneumonia and COVID-19 in Wales

Age-standardised and age-specific mortality rates for deaths due to influenza and pneumonia and COVID-19, Wales, occurring between 1 January and 31 August 2020 and registered by 5 September 2020



Source: Office for National Statistics

Notes:

1. Figures exclude deaths of non-residents.
2. Figures are based on boundaries as of May 2020.
3. Based on date a death occurred, registered up to 5 September 2020.
4. Figures for 2020 are based on provisional mortality data and projected populations.
5. The International Classification of Diseases, tenth edition (ICD-10) definitions are as follows: coronavirus (COVID-19) (U07.1 and U07.2), influenza and pneumonia (J09-J18).
6. Age-standardised mortality rates (ASMRs) per 100,000 population, standardised to the 2013 European Standard Population for all ages and under 65 years. For more information, see [Section 8: Measuring the data](#).

In 2020, age-standardised and age-specific mortality rates for deaths due to influenza and pneumonia were statistically significantly lower than the five-year average for all age groups in Wales. Those aged 85 years and over had the highest age-specific mortality rates, with 1,031.4 and 1,601.8 deaths per 100,000 people for 2020 and the five-year average respectively. These rates were statistically significantly higher than all other age groups.

The largest absolute difference in influenza and pneumonia mortality rates between 2020 and the five-year average was observed in those aged 85 years and over, with a difference of 570.4 deaths per 100,000 people. However, the largest percentage change was observed in those aged under 65 years, with mortality rates due to influenza and pneumonia in 2020 being 41.3% lower than the five-year average.

Age-standardised and age-specific mortality rates for deaths due to COVID-19 were statistically significantly higher for nearly all age groups compared with influenza and pneumonia deaths in 2020 or the five-year average. For those aged 85 years and over, COVID-19 mortality rates were higher than both 2020 and the five-year average but only statistically significantly higher than 2020. The highest age-specific mortality rate was observed in those aged 85 years and over, with 1,744.3 deaths per 100,000 people.

Comparing COVID-19 and 2020 influenza and pneumonia mortality rates, the largest absolute difference in rates was found in those aged 85 years and over, with a difference of 712.9 deaths per 100,000 people. In comparison, when comparing COVID-19 and the five-year average for influenza and pneumonia, the largest difference was found in those aged 80 to 84 years (257.8 deaths per 100,000 people).

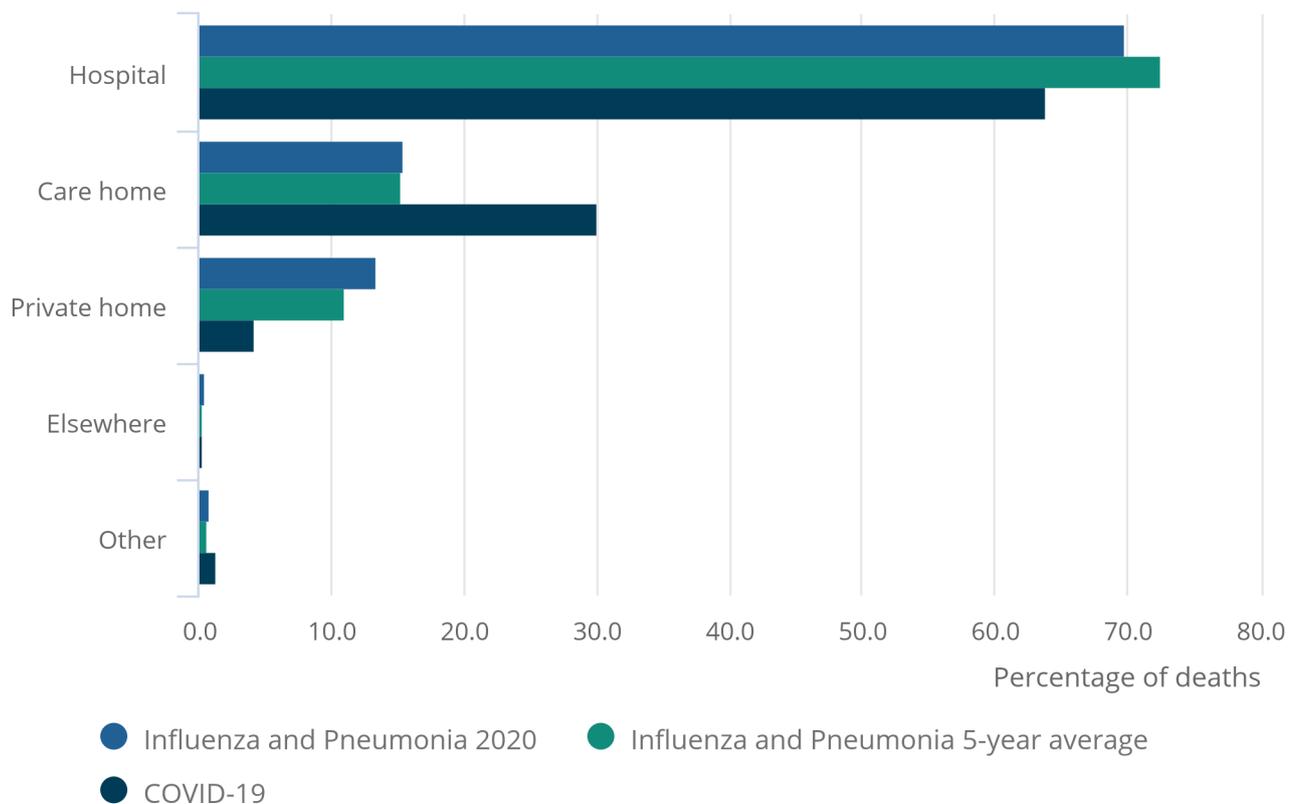
## 5 . Death occurrences by place of death

**Figure 7: In England a higher proportion of deaths due to COVID-19 occurred in care homes than deaths due to influenza and pneumonia**

Proportion of deaths due to influenza and pneumonia or COVID-19 by place of occurrence, England, occurring between 1 January and 31 August 2020 and registered by 5 September 2020

Figure 7: In England a higher proportion of deaths due to COVID-19 occurred in care homes than deaths due to influenza and pneumonia

Proportion of deaths due to influenza and pneumonia or COVID-19 by place of occurrence, England, occurring between 1 January and 31 August 2020 and registered by 5 September 2020



Source: Office for National Statistics

Notes:

1. Figures exclude deaths of non-residents.
2. Figures are based on boundaries as of May 2020.
3. Based on date a death occurred, registered up to 5 September 2020.
4. Figures for 2020 are based on provisional mortality data.
5. The International Classification of Diseases, tenth edition (ICD-10) definitions are as follows: coronavirus (COVID-19) (U07.1 and U07.2), influenza and pneumonia (J09-J18).

The highest number of deaths in England in 2020 due to both influenza and pneumonia (9,060 deaths), and the coronavirus (COVID-19) (29,284 deaths) occurred in hospitals. Deaths due to influenza and pneumonia were lower than the five-year average across all settings. The proportion of deaths due to influenza and pneumonia that occurred in hospitals was higher for the five-year average than in 2020 (72.5% for the five-year average, compared with 69.8% in 2020) while the proportion in care homes, private homes and other settings was higher in 2020 than the five-year average.

Around 15.4% of deaths in 2020 occurred in care homes, compared with 15.3% for the five-year average. In 2020, 13.5%, 0.5% and 0.9% of deaths due to influenza and pneumonia occurred in private homes, elsewhere and in other settings respectively. In comparison, 11.1%, 0.4% and 0.6% of deaths occurred in private homes, elsewhere and in other settings for the five-year average.

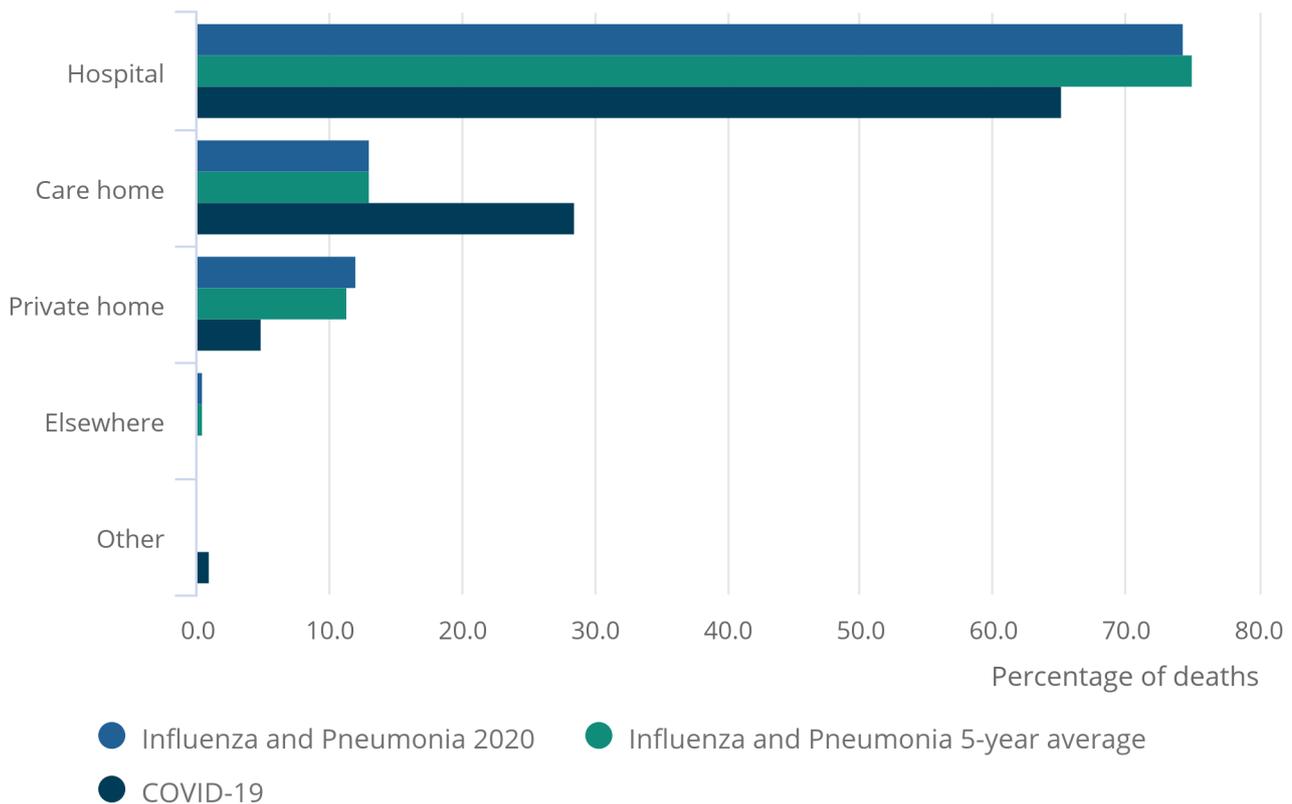
For deaths due to COVID-19 in England, a smaller proportion (63.9%) of deaths occurred in hospitals and private homes (4.3%) compared with 2020 deaths due to influenza and pneumonia and the five-year average. However, 30.0% of deaths due to COVID-19 occurred in care homes, around twice the proportion observed for 2020 and the five-year average for deaths due to influenza and pneumonia.

**Figure 8: A lower proportion of deaths due to COVID-19 occurred in hospital compared with deaths due to influenza and pneumonia in Wales**

Proportion of deaths due to influenza and pneumonia or COVID-19 by place of occurrence, Wales, occurring between 1 January and 31 August 2020 and registered by 5 September 2020

Figure 8: A lower proportion of deaths due to COVID-19 occurred in hospital compared with deaths due to influenza and pneumonia in Wales

Proportion of deaths due to influenza and pneumonia or COVID-19 by place of occurrence, Wales, occurring between 1 January and 31 August 2020 and registered by 5 September 2020



Source: Office for National Statistics

Notes:

1. Figures exclude deaths of non-residents.
2. Figures are based on boundaries as of May 2020.
3. Based on date a death occurred, registered up to 5 September 2020.
4. Figures for 2020 are based on provisional mortality data.
5. The International Classification of Diseases, tenth edition (ICD-10) definitions are as follows: coronavirus (COVID-19) (U07.1 and U07.2), influenza and pneumonia (J09-J18).

In 2020, hospitals had the highest number of deaths due to influenza and pneumonia (756 deaths) and deaths due to COVID-19 (1,501 deaths) in Wales. Deaths due to influenza and pneumonia in the year-to-date were lower than the five-year average across all settings.

The highest proportion of deaths due to influenza and pneumonia occurred in hospitals in 2020 (74.4%), followed by care homes (13.1%), private homes (12.0%) and elsewhere (0.5%). These proportions were similar to those observed for the five-year average.

For deaths due to COVID-19 in Wales, a smaller proportion (65.2%) of deaths occurred in hospitals and private homes (4.9%) compared with 2020 deaths due to influenza and pneumonia and the five-year average. However, 28.6% of COVID-19 deaths occurred in care homes, over twice as many as the proportion of deaths due to influenza and pneumonia in 2020 (13.1%) and the five-year average (13.0%) that occurred in care homes.

## 6 . Deaths data

Deaths due to the coronavirus (COVID-19) compared with deaths from influenza and pneumonia, England and Wales, deaths occurring between 1 January and 31 August 2020 Dataset | Released 8 October 2020  
Provisional counts and rates of deaths occurring in England and Wales due to COVID-19, influenza and pneumonia, by age, sex and place of death.

## 7 . 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 8: 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 [World Health Organisation \(WHO\)](#).

## 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 \(PDF, 4.0KB\)](#).

## 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](#).

## 8 . 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 a comparison between influenza and pneumonia, and the coronavirus (COVID-19) as an underlying cause of death. Data are also provided in the accompanying dataset for deaths where there was any mention of influenza, pneumonia or COVID-19 on a death certificate.

The analysis in this bulletin is based on deaths by the date on which they occurred. This allows for the analysis of the most current trends to be carried out using the data available at the time of extraction (deaths registered and processed by 5 September 2020). The data used in this bulletin are provisional and therefore there may be changes in the number of deaths that have occurred in 2020 as more deaths are registered, especially for the number of deaths occurring towards the end of August 2020. 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 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.

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](https://www.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](#).

## 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 monthly populations for January to August have been summed for data used in this bulletin. The output is used as the population denominator in calculations of age-standardised and age-specific mortality rates.

For example:

June 2020 population =

$$population_{2019}(i) + population_{2020} - (population_{2019}(i) = (m/M)) \times (N/M)$$

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.

## 9 . Strengths and limitations

### Provisional data

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](#), death occurrence data are always somewhat incomplete. This is especially true for deaths that occurred towards the end of the month.

Data for England and Wales combined include deaths of non-residents. Deaths for England and Wales separately covers deaths of usual residents of each country. In the period January to August 2020, there were 530 deaths of non-residents that occurred in England and Wales.

Further information can be found in the [Mortality statistics in England and Wales QMI](#) and the [User guide to mortality statistics](#)

## 10 . Related links

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

Bulletin | Released 6 October 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.

### [Monthly mortality analysis. England and Wales: August 2020](#)

Bulletin | Released 18 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.

### [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.