

Article

Deaths due to COVID-19, registered in England and Wales: 2021

Deaths registered in England and Wales due to coronavirus (COVID-19) by age, sex, region, indices of deprivation, place of death, and pre-existing condition.

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1 . Main points

- Of all deaths registered in 2021 in England and Wales, 67,350 (11.5%) were due to coronavirus (COVID-19); the age-standardised mortality rate (ASMR) was 113.8 deaths per 100,000 people.
- January had the highest number of deaths (27,488) and ASMR (550.9 deaths per 100,000 people) for deaths due to COVID-19 in England and Wales.
- London had the highest ASMR for deaths due to COVID-19 in 2021 (153.1 deaths per 100,000 people); the South West of England had the lowest (69.4 deaths per 100,000 people).
- In Wales, the ASMR for deaths due to COVID-19 in 2021 was 106.6 deaths per 100,000 people.
- The mortality rate was highest in the most deprived decile in England (185.0 deaths per 100,000 people) and most deprived quintile in Wales (146.1 deaths per 100,000 people) in 2021.
- In England and Wales, hospitals had the highest proportion of deaths due to COVID-19 in 2021 - 19.3% of all deaths that occurred in hospitals.
- Among deaths due to COVID-19 in England and Wales in 2021, diabetes was the most common pre-existing condition mentioned on death certificates (14,159 deaths).

2 . Overview

This article is an addition to our [annual death registrations release for 2021](#), providing an in-depth look at deaths due to and involving coronavirus (COVID-19) over the year.

In 2021, periods of high COVID-19 deaths were followed by overall deaths generally below what would be expected for that period, and over half of [excess mortality](#) in the latter half of 2021 was driven by non-COVID-19 deaths. Although this indicates that the coronavirus pandemic's impact on mortality goes beyond COVID-19 deaths, how these deaths impact mortality rates in England and Wales provide context to these trends.

There was a total of 586,334 deaths registered in England and Wales in 2021. Of these deaths, 77,727 involved COVID-19 (13.3% of all deaths), of which, 67,350 were due to COVID-19 (11.5% of all deaths).

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

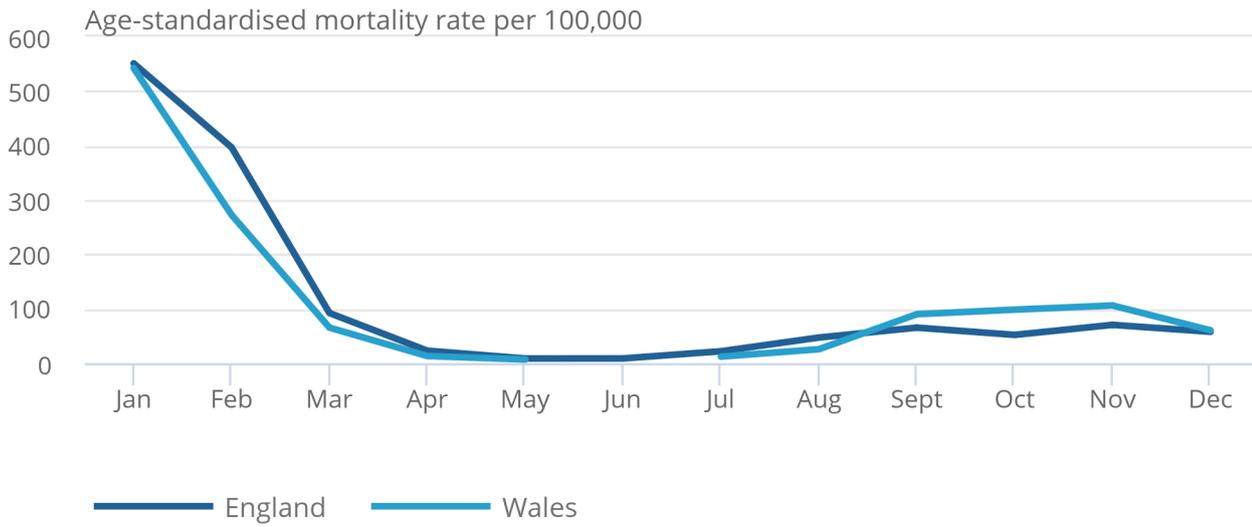
3 . Deaths due to COVID-19 by month

Figure 1: Mortality rates in 2021 were highest in January, for both England and Wales

Age-standardised mortality rates for deaths due to COVID-19, deaths registered 2021, England and Wales

Figure 1: Mortality rates in 2021 were highest in January, for both England and Wales

Age-standardised mortality rates for deaths due to COVID-19, deaths registered 2021, England and Wales



Source: Office for National Statistics- Deaths registered in England and Wales

Notes:

1. Figures are for deaths registered in a calendar year rather than occurred.
2. Figures are based on area of usual residence and exclude non-residents.
3. The International Classification of Diseases 10th Edition definitions are as follows: COVID-19 (U07.1, U07.2 and U10.9).
4. Due to small numbers, the rate for May 2021 in Wales is unreliable (19 deaths) so should be interpreted with caution, and the rate for June 2021 (3 deaths) has not been calculated and is denoted as [x] in the data download.

In England, in 2021, there were 73,299 deaths registered involving coronavirus (COVID-19), of which 63,555 were due to COVID-19. In Wales, 4,272 deaths involved COVID-19, with 3,650 due to COVID-19.

Age-standardised mortality rates (ASMRs) allow for comparisons over time and area because they account for the population size and age structure.

In 2021, the ASMR in England (114.0 deaths per 100,000 people) was [statistically significantly](#) higher than in Wales (106.6 deaths per 100,000 people). The mortality rate for deaths due to COVID-19 was significantly lower in 2021 than 2020 for both England (126.6 deaths per 100,000 people) and Wales (129.7 deaths per 100,000 people).

The highest mortality rate for deaths due to COVID-19 was in January 2021 in both England (550.8 deaths per 100,000 people; 25,889 deaths) and Wales (542.1 per 100,000 people; 1,569 deaths). However, these were not significantly different. Of all deaths registered due to COVID-19 in 2021, nearly half were registered in January (40.7% and 43.0% in England and Wales, respectively).

Following this, both countries generally reported significant decreases to their lowest ASMR in May for both England and Wales (8.5 and 6.6 deaths per 100,000 people respectively). Wales reported 19 deaths in May, therefore, the rate is unreliable, and was not calculated in June because of the [small numbers](#) (3 deaths).

Both countries subsequently saw an increase in mortality rates in the latter half of 2021, with England and Wales reaching 70.3 and 105.9 deaths per 100,000 people respectively in November. This was followed by significant decreases in December, to 57.6 deaths per 100,000 people in England and 60.3 deaths per 100,000 people in Wales.

Patterns of deaths due to COVID-19 by sex and age in 2021 were similar to 2020, as detailed in our [previous article](#). A full breakdown of mortality rates by sex, age and International Classification of Diseases 10th Edition code is available in the [accompanying dataset](#).

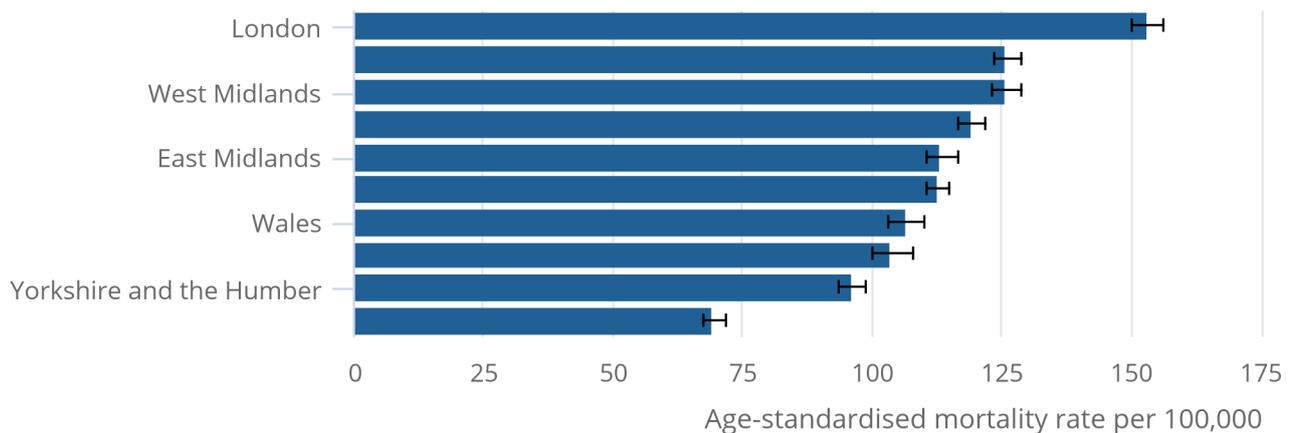
4 . Deaths due to COVID-19 in Wales and English regions

Figure 2: London had the highest mortality rate for COVID-19 deaths in 2021 of the English regions and Wales

Age-standardised mortality rates for deaths due to COVID-19, deaths registered 2021, Wales and English regions

Figure 2: London had the highest mortality rate for COVID-19 deaths in 2021 of the English regions and Wales

Age-standardised mortality rates for deaths due to COVID-19, deaths registered 2021, Wales and English regions



Source: Office for National Statistics – Deaths registered in England and Wales

Notes:

1. Figures are for deaths registered in a calendar year rather than occurred.
2. Figures are based on area of usual residence and exclude non-residents.
3. Geographical boundaries are based on the most up-to-date information available.
4. The International Classification of Diseases 10th Edition definitions are as follows: COVID-19 (U07.1, U07.2 and U10.9).
5. Error bars represent 95% confidence intervals with lower boundaries (LCI) and upper boundaries (UCI). For more information, [see the Glossary](#).

Age-standardised mortality rates (ASMRs) for deaths due to coronavirus (COVID-19) in 2021 were highest in London at 153.1 deaths per 100,000 people (9,526 deaths); this was [statistically significantly](#) higher than any other region.

The South West recorded the lowest ASMR for deaths due to COVID-19 in 2021 at 69.4 deaths per 100,000 people (4,692 deaths); this was significantly lower than any other region.

A full breakdown of mortality rates by region and month is available in the [accompanying dataset](#), alongside further geographical breakdowns, including local authority.

5 . Deaths due to COVID-19 by indices of deprivation

In this section, we look at deaths due to coronavirus (COVID-19) by relative deprivation, using Index of Multiple Deprivation (IMD) [deciles for England](#) and [quintiles for Wales](#).

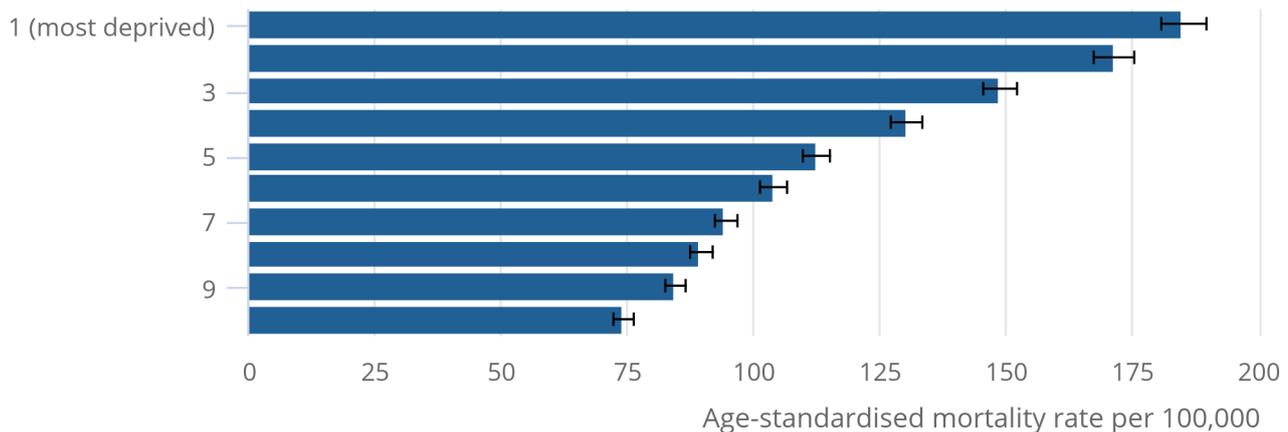
In 2021, the highest age-standardised mortality rate (ASMR) for deaths due to COVID-19 was in the most deprived areas of England (decile 1), at 185.0 deaths per 100,000 people (7,336 deaths). With each increase in decile, the ASMR decrease is [statistically significant](#), with the least deprived areas (decile 10) recording the lowest ASMR, at 74.0 deaths per 100,000 people (5,010 deaths).

Figure 3: Mortality rates for deaths due to COVID-19 were highest in the most deprived areas of England in 2021

Age-standardised mortality rates for deaths due to COVID-19 by IMD decile, deaths registered 2021, England

Figure 3: Mortality rates for deaths due to COVID-19 were highest in the most deprived areas of England in 2021

Age-standardised mortality rates for deaths due to COVID-19 by IMD decile, deaths registered 2021, England



Source: Office for National Statistics – Deaths registered in England and Wales

Notes:

1. Figures are for deaths registered in a calendar year rather than occurred.
2. Figures are based on area of usual residence and exclude non-residents.
3. Geographical boundaries are based on the most up-to-date information available.
4. The International Classification of Diseases 10th Edition definitions are as follows: COVID-19 (U07.1, U07.2 and U10.9).
5. Deprivation deciles are based on the [Index of Multiple Deprivation \(IMD\)](#).
6. Error bars represent 95% confidence intervals with lower boundaries (LCI) and upper boundaries (UCI). For more information, [see the Glossary](#).

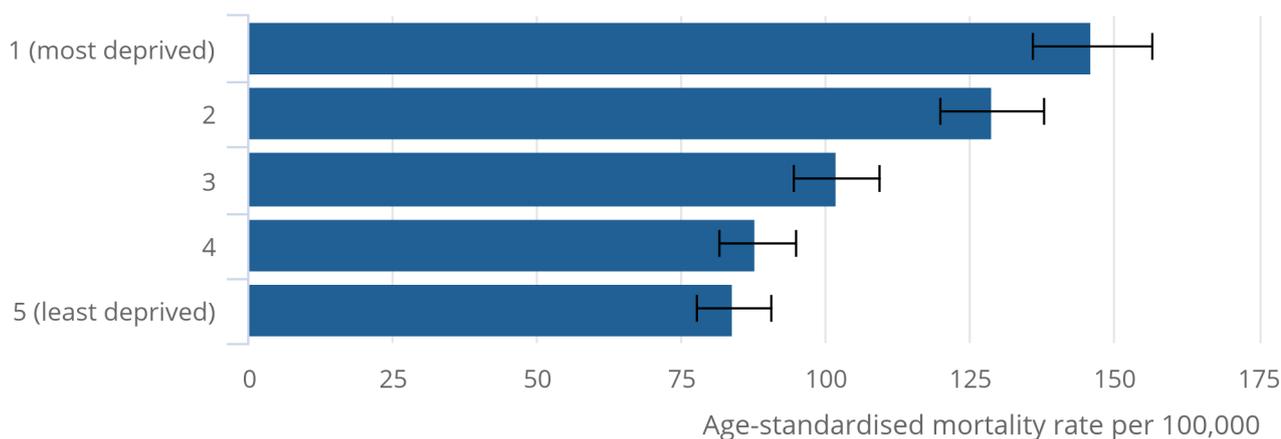
Similarly, in Wales the ASMR for deaths due to COVID-19 was highest in the most deprived areas (quintile 1), at 146.1 deaths per 100,000 people (751 deaths). The ASMRs gradually decrease with each increase in quintile, falling to 83.9 deaths per 100,000 people (660 deaths) in the least deprived areas (quintile 5). The ASMR in the least deprived areas was significantly lower than the ASMR in the most deprived areas.

Figure 4: Mortality rates for deaths due to COVID-19 were highest in the most deprived areas of Wales in 2021

Age-standardised mortality rates for deaths due to COVID-19, by IMD quintile, 2021, Wales

Figure 4: Mortality rates for deaths due to COVID-19 were highest in the most deprived areas of Wales in 2021

Age-standardised mortality rates for deaths due to COVID-19, by IMD quintile, 2021, Wales



Source: Office for National Statistics – Deaths registered in England and Wales

Notes:

1. Figures are for deaths registered in a calendar year rather than occurred.
2. Figures are based on area of usual residence and exclude non-residents.
3. Geographical boundaries are based on the most up-to-date information available.
4. The International Classification of Diseases 10th Edition definitions are as follows: COVID-19 (U07.1, U07.2 and U10.9).
5. Deprivation quintiles are based on the [Welsh Index of Multiple Deprivation \(IMD\)](#).
6. Error bars represent 95% confidence intervals with lower boundaries (LCI) and upper boundaries (UCI). For more information, [see the Glossary](#).

A full breakdown of mortality rates by IMD and month is available in the [accompanying dataset](#). There are complex factors to consider when trying to understand why COVID-19 deaths are higher in the most deprived areas compared with the least deprived areas. For more information on the indirect effects of the coronavirus pandemic, see [The Office for Health Improvement and Disparities' Wider Impacts of COVID-19 on Health monitoring tool](#).

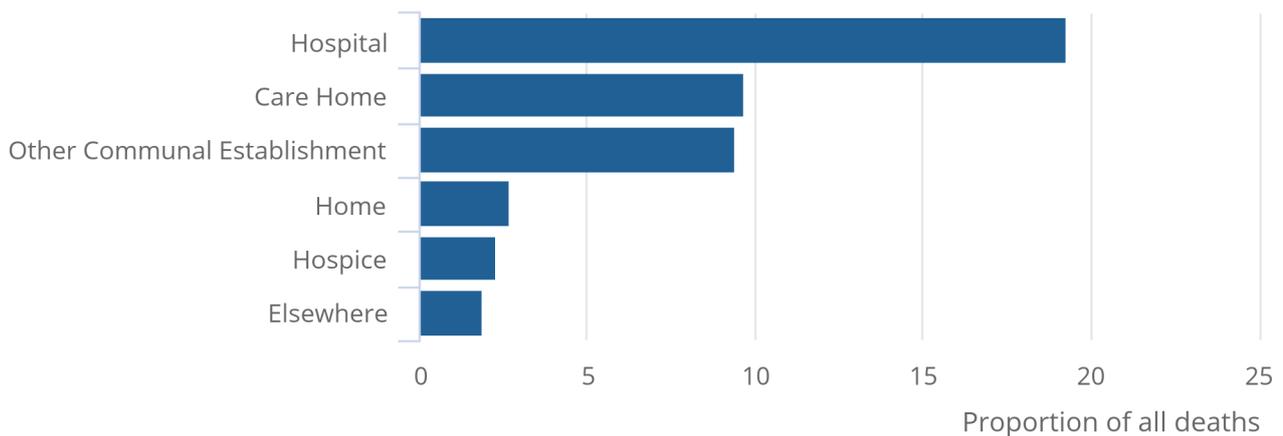
6 . Deaths due to COVID-19 by place of occurrence

Figure 5: Hospitals had the highest proportion of deaths due to COVID-19 in England and Wales in 2021

Proportion of deaths due to COVID-19 by place of occurrence, deaths registered 2021, England and Wales

Figure 5: Hospitals had the highest proportion of deaths due to COVID-19 in England and Wales in 2021

Proportion of deaths due to COVID-19 by place of occurrence, deaths registered 2021, England and Wales



Source: Office for National Statistics – Deaths registered in England and Wales

Notes:

1. Figures are for deaths registered in a calendar year rather than occurred.
2. Figures include deaths of non-residents.
3. More information on the place of death definitions used is available in the [accompanying dataset](#).
4. The International Classification of Diseases 10th Edition definitions are as follows: COVID-19 (U07.1, U07.2 and U10.9).

Hospitals had the highest proportion of deaths due to COVID-19, with 19.3% of all deaths occurring in hospital due to COVID-19; this pattern was true across all age groups (see the [accompanying dataset](#)). This was followed by care homes and other communal establishments, with 9.7% and 9.4% of all deaths occurring in that location respectively. Lower proportions of deaths due to COVID-19 occurred in private homes (2.7%), hospices (2.3%) and locations elsewhere (1.9%).

7 . Pre-existing conditions of people whose death was due to COVID-19

This section looks at pre-existing conditions of deaths due to coronavirus (COVID-19), based on our [leading causes of death](#) groupings. Some codes not included in this list have been included if there were a high number of deaths with this pre-existing condition mentioned on the death certificate.

We define a pre-existing condition here as the last health condition mentioned on the first part of the death certificate (the direct sequence of events leading to death) when it is recorded on a lower line to, and therefore clearly preceding, COVID-19. However, having a pre-existing condition does not mean that the person was at imminent risk of dying from that condition or were considered to have a reduced life expectancy. For more information, see the [accompanying dataset](#).

Table 1: Number of deaths due to COVID-19 by pre-existing condition, deaths registered 2021, England and Wales

Pre-existing condition	ICD-10 Code	Number of deaths due to COVID-19 with this pre-existing condition	Proportion of all deaths due to COVID-19
Diabetes	E10 to E14	14,159	21.0
Hypertensive diseases	I10 to I15	12,911	19.2
Dementia and Alzheimer's disease	F01, F03, G30	11,623	17.3
Chronic lower respiratory diseases	J40 to J47	11,387	16.9
Symptoms signs and ill-defined conditions	R00 to R99	11,020	16.4
Ischaemic heart diseases	I20 to I25	9,358	13.9
Diseases of the urinary system	N00 to N39	9,252	13.7
Heart failure and complications and ill-defined heart disease	I50 to I51	5,919	8.8
Cardiac arrhythmias	I47 to I49	5,631	8.4
Cerebrovascular diseases	I60 to I69	4,125	6.1

Source: Office for National Statistics – Deaths registered in England and Wales

Notes

1. Figures are for deaths registered in a calendar year rather than occurred.
2. Figures include non-residents.
3. The International Classification of Diseases 10th Edition (ICD-10) definitions are as follows: COVID-19 (U07.1, U07.2 and U10.9).
4. Some deaths will be counted twice if there was more than one pre-existing condition, therefore the total number of deaths will be greater than the total number of deaths due to COVID-19.

Of the 67,350 deaths due to COVID-19 in England and Wales in 2021, diabetes was the most common pre-existing condition mentioned on death certificates (14,159 deaths); this replaced dementia and Alzheimer's disease as the most common in 2020. Of these, the majority were people aged 65 years and over (82.1%; 11,631 deaths). Of deaths due to COVID-19 with diabetes mentioned as a pre-existing condition, the majority occurred in hospitals (86.7%).

The second most common pre-existing condition of deaths due to COVID-19 was hypertensive diseases (12,911 deaths); of these, 85.0% of deaths were people aged 65 years and over (10,973 deaths).

Similarly, in England, diabetes, and hypertensive diseases were the most common pre-existing conditions mentioned on death certificates where the underlying cause was COVID-19 (13,450 and 12,447 deaths respectively). In Wales, the most common pre-existing condition was also diabetes (665 deaths), and the second was chronic lower respiratory diseases (649 deaths).

Of the 67,350 deaths due to COVID-19 in England and Wales in 2021, 14.2% had no pre-existing conditions mentioned on the death certificate; it was most common for there to be either one or two pre-existing conditions (53.9% of COVID-19 deaths).

8 . Deaths due to COVID-19, registered in England and Wales, 2021 data

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

Dataset | Released 1 July 2021

The number of deaths registered in England and Wales due to and involving coronavirus (COVID-19). Breakdowns include age, sex, region, local authority, Middle-layer Super Output Area (MSOA), indices of deprivation and place of death. Includes age-specific and age-standardised mortality rates.

[Pre-existing conditions of people who died due to COVID-19, England and Wales](#)

Dataset | Released 1 July 2021

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

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.

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. Further information about [COVID-19 disease is available from the World Health Organisation \(WHO\)](#).

The following International Classification of Diseases, 10th Edition (ICD-10) codes and definitions are used to define deaths due to COVID-19 and involving COVID-19:

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

ICD-10 codes U09.9 (Post-COVID condition, where the acute COVID had ended before the condition immediately causing death occurred) and U10.9 (Multisystem inflammatory syndrome associated with COVID-19 (also called Kawasaki-like syndrome), a specific, uncommon effect of COVID-19 in children) were issued by the World Health Organization (WHO) in early 2021 and implemented in the [February 2021 monthly mortality bulletin](#) and the [Week 8 of 2021 weekly deaths bulletin](#).

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](#).

We use the term "due to COVID-19" when referring only to deaths with an underlying cause of death of COVID-19. When considering all the deaths that had COVID-19 mentioned anywhere on the death certificate, whether as an underlying cause or not, we use the term "involving COVID-19". Age-standardised rates for deaths due to COVID-19 and involving COVID-19 are available in the [accompanying dataset](#).

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

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

ICD-10 code U08.9 is used to record an earlier episode of COVID-19 when the person no longer suffers from COVID-19. ICD-10 codes U11.9 and U12.9 relate to COVID-19 vaccines rather than COVID-19 itself.

U11.9 is an optional code that may be used when a person encounters health services for the specific purposes of receiving a COVID-19 vaccine, and U12.9 covers deaths caused by an adverse effect of the COVID-19 vaccine.

Pre-existing condition

A pre-existing condition is defined as any condition that either preceded the disease of interest (for example, COVID-19) in the sequence of events leading to death or was a contributory factor in the death but was not part of the causal sequence. More information on the pre-existing conditions methodology is available in the [accompanying dataset](#).

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. More information is available in our [Impact of registration delays on mortality statistics in England and Wales article](#).

Statistical significance

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

95% confidence intervals

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

10 . Data sources and quality

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](#).

Socioeconomic deprivation

Socioeconomic deprivation is measured using [England's Index of Multiple Deprivation](#) and the [Welsh Index of Multiple Deprivation](#), which provides an overall relative measure of deprivation for each Lower layer Super Output Area (LSOA).

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. In England and Wales, deaths should be registered within five days of the death occurring, but there are some situations that result in the registration of the death being delayed. For example, when a death needs to be investigated by a coroner. More information on this issue can be found in our [Impact of registration delays on mortality statistics in England and Wales: 2020 article](#).

Populations

Finalised [population estimates](#) for the year are typically used in this release to calculate mortality rates; these are usually published in the summer of the following data year. However, population estimates for 2021 will not be published until the autumn of 2022; this is typical of data years which a census falls in, as is the case with 2021. As a result, the most up-to-date sub-national [population projections](#) have been used to calculate mortality rates. This is so that the Office for National Statistics can provide timely and transparent annual statistics to the public. Population projections are based on 2018 population estimates and therefore do not account for population changes because of the coronavirus (COVID-19) pandemic, Brexit or other events. Rates should therefore be interpreted with caution, until they can be revised with finalised population estimates.

11 . Related links

[Death registration summary statistics, England and Wales: 2021](#)

Article | Released 9 June 2022

Number of deaths registered by year, sex, area of usual residence and selected underlying cause of death.

[Deaths registered in England and Wales: 2021](#)

Bulletin | Released 6 July 2022

Registered deaths by age, sex, selected underlying causes of death and the leading causes of death.

Contains death rates and death registrations by area of residence and single year of age.

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

Bulletin | Weekly

Provisional counts of the numbers 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](#)

Bulletin | Monthly

Provisional death registration data for England and Wales, broken down by sex, age and country. Includes analysis of deaths due to COVID-19 compared with the leading causes of death. Datasets include deaths due to COVID-19 by local area and socioeconomic deprivation.

[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.