

Statistical bulletin

Winter mortality in England and Wales: 2021 to 2022 (provisional) and 2020 to 2021 (final)

Winter mortality compares the number of deaths that occurred in the winter period (December to March) with the average of the non-winter periods (the preceding August to November and following April to July). We present data by sex, age, cause of death, region and place of death.



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1 . Main points

- An estimated 13,400 more deaths occurred in the winter period (December 2021 to March 2022) compared with the average of the non-winter periods; this was the second-lowest figure since 1950 to 1951 and was affected by the larger number of deaths in the non-winter months (August 2021 to November 2021 and April 2022 to July 2022).
- The winter mortality (WM) index in England (7.3%) was significantly lower than every winter since the series began in 1991 to 1992, except in 2019 to 2020.
- In Wales, the WM index (7.1%) was significantly lower than all winters in the time series.
- Coronavirus (COVID-19) was the leading cause of winter mortality in England, with 25.9% more deaths occurring in the winter period than the non-winter period.
- In Wales, the leading cause of winter mortality was dementia and Alzheimer's disease (15.2%).

The terminology used in this bulletin has changed to provide clearer explanation of what the analysis represents. This bulletin will now be called winter mortality (previously excess winter mortality). The measures have been renamed to winter deaths compared to non-winter deaths (previously excess winter deaths) and winter mortality index (previously excess winter mortality index). There have been no methodology changes.

2 . Overview of winter mortality

The purpose of the winter mortality measure is to compare the number of deaths that occurred in the winter period (December to March) with the average of the non-winter periods (August to November and April to July). Winter mortality is not solely a reflection of temperature, but of other factors as well. These include respiratory diseases and pressure on services, which have been more intense than usual during and following the height of the pandemic.

All figures in this bulletin include coronavirus (COVID-19) deaths. Data excluding COVID-19 deaths are available in the [accompanying dataset](#).

Figure 1: 13,400 more deaths occurred in the 2021 to 2022 winter period compared with the average of the non-winter periods

Number of deaths, England and Wales, occurring between August 2021 to July 2022

Notes:

1. Figures include deaths of non-residents.
2. Figures are based on deaths occurring in each period (August to July).
3. Numbers of deaths from January to July 2022 are provisional and adjusted for late registrations.

Download the data

[.xlsx](#)

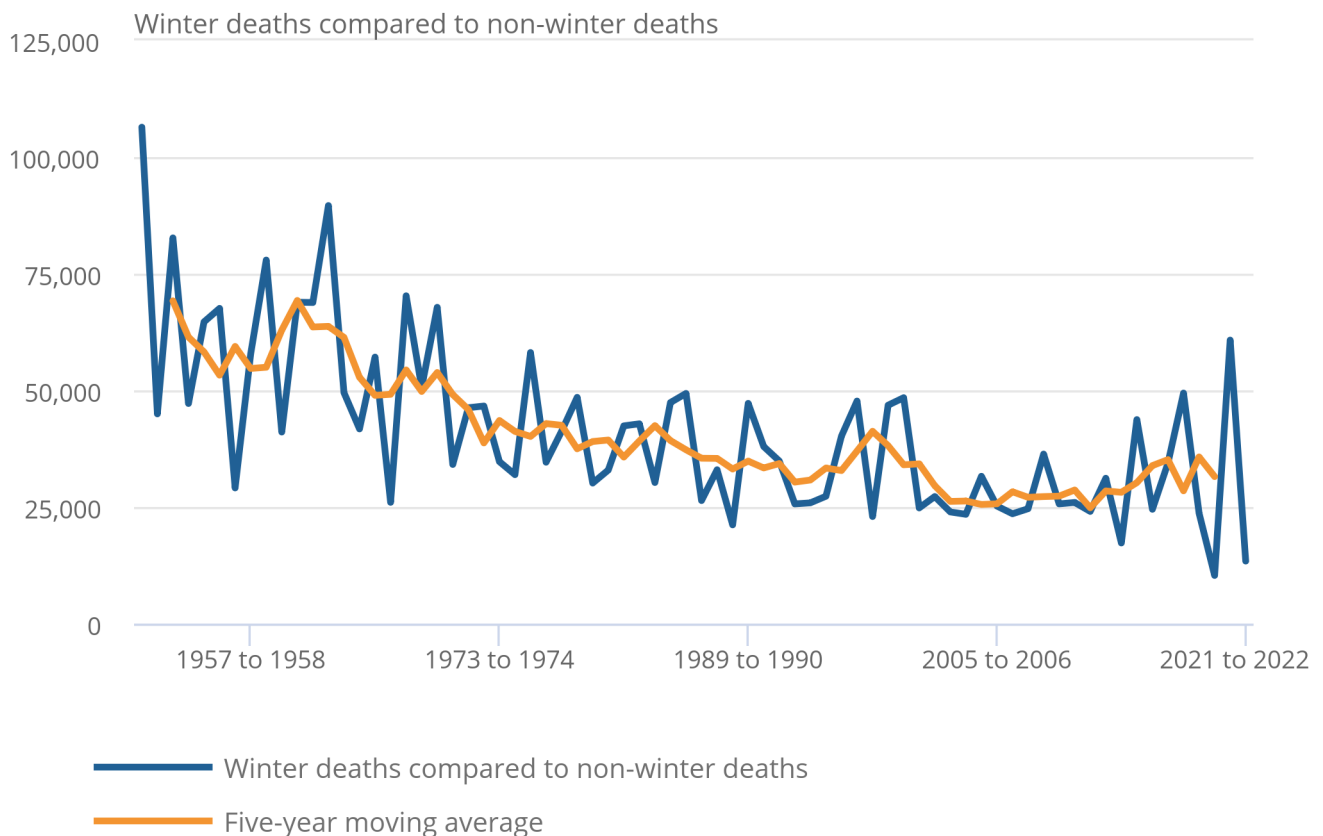
In the 2021 to 2022 winter period, 13,400 more deaths occurred in England and Wales compared with the average of the non-winter periods (Figure 1). This was the second-lowest number across the whole time series; the lowest occurred in 2019 to 2020 (Figure 2).

Figure 2: 2021 to 2022 had the second-lowest number of winter deaths compared to non-winter deaths since 1950 to 1951

Winter deaths compared to non-winter deaths and five-year central moving averages, England and Wales, occurring between 1950 to 1951 and 2021 to 2022

Figure 2: 2021 to 2022 had the second-lowest number of winter deaths compared to non-winter deaths since 1950 to 1951

Winter deaths compared to non-winter deaths and five-year central moving averages, England and Wales, occurring between 1950 to 1951 and 2021 to 2022



Source: Office of National Statistics - Winter Mortality in England and Wales

Notes:

1. Central moving averages were calculated using the winter period of interest and the two winter periods before and after.
2. See Figure 1 for other relevant notes.

The decrease in our winter deaths measure is affected by the larger number of deaths observed during the non-winter period, particularly between August to November 2021. Previous analysis has shown that since April 2020, [deaths in the non-winter months have increased](#).

The winter mortality index in 2021 to 2022 showed that 7.3% and 7.1% more deaths occurred in the winter period compared to the non-winter period in England and Wales, respectively (Figure 3). This was significantly lower than all periods since the time series began in 1991 to 1992 for Wales, and significantly lower than all periods except 2019 to 2020 for England.

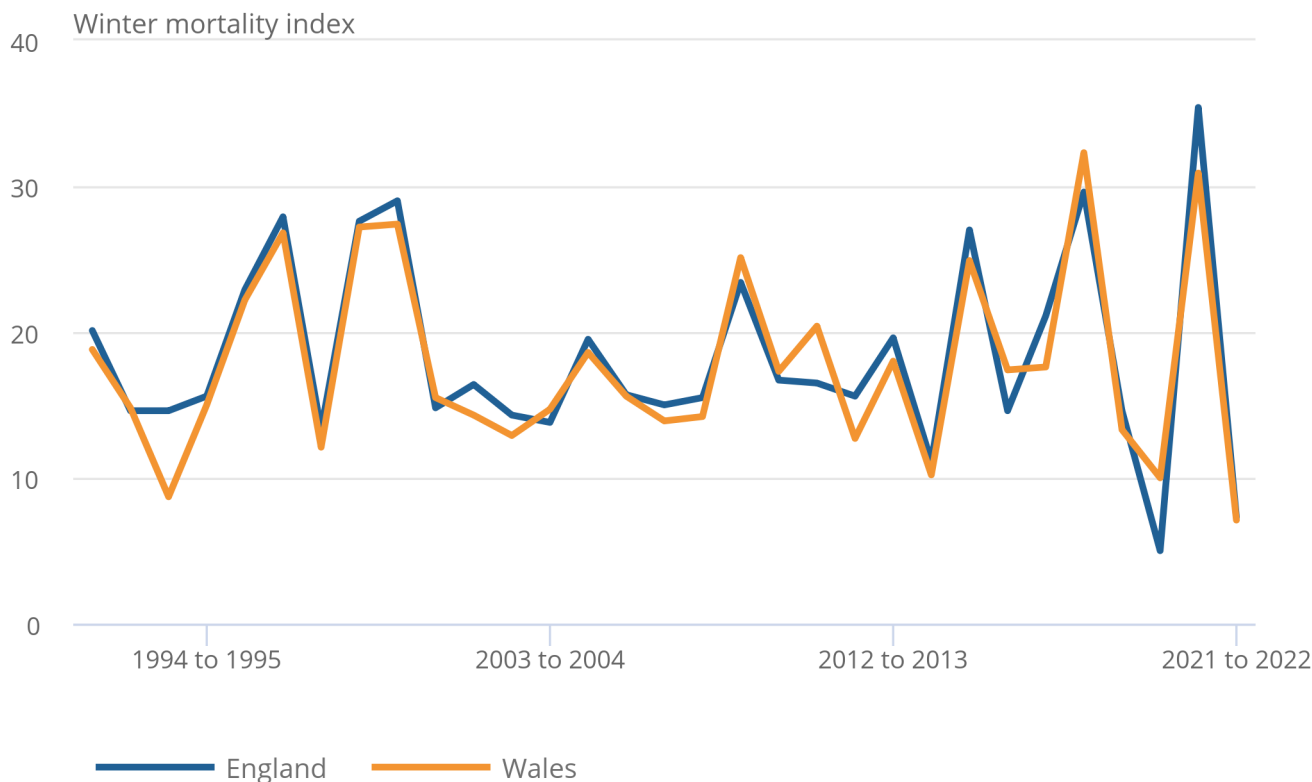
A low winter mortality index can be because of either a large number of deaths in the non-winter months (such as 2021 to 2022), or fewer deaths in the winter months.

Figure 3: The winter mortality index in 2021 to 2022 was the lowest since the time series began in Wales and the second lowest in England

Winter mortality index by country, England and Wales, occurring between 1991 to 1992 and 2021 to 2022

Figure 3: The winter mortality index in 2021 to 2022 was the lowest since the time series began in Wales and the second lowest in England

Winter mortality index by country, England and Wales, occurring between 1991 to 1992 and 2021 to 2022



Source: Office for National Statistics - Winter Mortality in England and Wales

Notes:

1. Figures exclude deaths of non-residents.
2. Figures are based on deaths occurring in each period (August to July).
3. Numbers of deaths from January to July 2022 are provisional and adjusted for late registrations.

[Northern Ireland](#) and [Scotland's](#) winter mortality measures observed similar patterns where their 2021 to 2022 provisional index was, respectively, the lowest and second lowest on record because of an increase in non-winter deaths.

3 . Daily deaths

Figure 4: Daily deaths in England and Wales were below the five-year average for the majority of the winter period

Number of daily deaths and five-year average daily deaths by country, England and Wales, occurring between August 2021 to July 2022.

Notes:

1. Five-year averages for 2021 are calculated using 2015 to 2019; five-year averages for 2022 are calculated using 2016 to 2019 and 2021.
2. See Figure 3 for other relevant notes.

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In England and Wales, the number of daily deaths during the 2021 to 2022 winter were below the five-year average for much of the period (67 and 74 out of 121 days, respectively) (Figure 4). In contrast, the majority of daily deaths in the non-winter months were above the five-year average. This was particularly noticeable between August to November, where all daily deaths in England were above the average, and 100 out of 122 days above the average in Wales.

Previously, the peak in daily deaths was observed during the winter months. However, in 2021 to 2022, the highest number of daily deaths was recorded during the non-winter period, 19 July. This coincided with a Met Office "Red Extreme" heat weather warning and a UK Health Security Agency (UKHSA) Level 4 heat health alert. More information is available in our [Excess mortality during heat-periods: 1 June to 31 August 2022 article](#).

4 . Winter mortality by sex and age

Figure 5: The winter mortality index was highest for those aged 90 years and over

Winter mortality index by age group, sex and country, England and Wales, occurring between 2021 to 2022

Notes:

1. For instances where non-winter deaths were higher than winter deaths, the winter mortality index will be a negative value.
2. See Figure 3 for other relevant notes.

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It is interesting to note that there were more death occurrences during the non-winter periods compared to the winter period for females aged 80 to 84 years in Wales. These findings contrasted with data from other age groups (Figure 5).

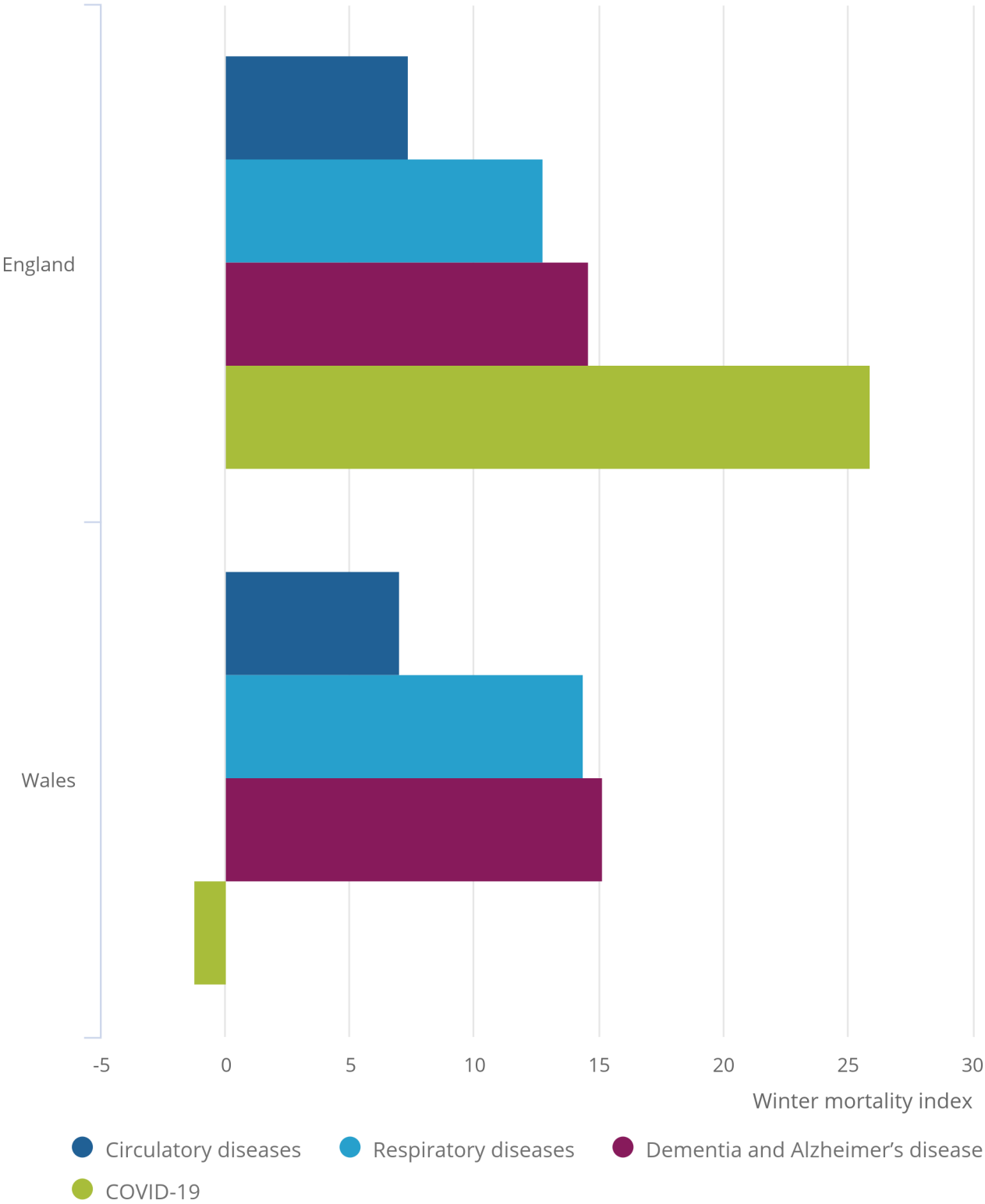
5 . Winter mortality by cause of death

Figure 6: The leading cause of winter mortality in England was coronavirus (COVID-19); for Wales it was dementia and Alzheimers disease

Winter mortality index by underlying cause of death and country, England and Wales, occurring between 2021 to 2022

Figure 6: The leading cause of winter mortality in England was coronavirus (COVID-19); for Wales it was dementia and Alzheimer’s disease

Winter mortality index by underlying cause of death and country, England and Wales, occurring between 2021 to 2022



Notes:

1. The International Classification of Diseases, 10th edition (ICD-10) definitions are: circulatory diseases (I00 to I99), respiratory diseases (J00-J99), dementia and Alzheimer's disease (F01, F03 and G30), and COVID-19 (U07.1, U07.2 and U10.9).
2. For instances where non-winter deaths were higher than winter deaths, the winter mortality index will be a negative value.
3. See Figure 3 for other relevant notes.

In England, coronavirus (COVID-19) was the leading cause of winter mortality during 2021 to 2022, with 25.9% more deaths occurring in the winter than the non-winter (Figure 6). [This was significantly lower than 2020 to 2021 \(567.2%\).](#)

In Wales, dementia and Alzheimer's disease had the highest winter mortality index in 2021 to 2022 (15.2%). Interestingly, for COVID-19, more deaths occurred in the non-winter periods compared to the winter period, resulting in a negative mortality index (-1.2%). This is a large contrast compared with 2020 to 2021 (460.5%).

6 . Winter mortality across regions of England and in Wales

Figure 7: London had the highest winter mortality index in 2021 to 2022

Winter mortality index for regions of England and in Wales, occurring between 2021 to 2022

Notes:

1. Figures are based on August 2022 boundaries.
2. See Figure 3 for other relevant notes.

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In 2021 to 2022, the highest winter mortality index was in London (9.6%) which was significantly higher than all other English regions, Wales (7.1%) and the England average (7.3%).

7 . Winter mortality by place of death

Figure 8: The winter mortality index was highest in private homes in 2021 to 2022, however it remained significantly lower than the five-year average

Winter mortality index and five-year averages by place of death and country, England and Wales, 2021 to 2022

Notes:

1. Five-year averages for 2021 are calculated using 2015 to 2019; five-year averages for 2022 are calculated using 2016 to 2019 and 2021.
2. The "Other" category encompasses elsewhere, other communal establishments and hospices.
3. See Figure 3 for other relevant notes.

Download the data

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In 2021 to 2022, the highest winter mortality (WM) index in England and Wales was observed in private homes (9.1% and 7.8%, respectively) (Figure 8).

Compared with the five-year average, the WM index in 2021 to 2022 was significantly lower across all places of death in England and Wales, except for "Other" in Wales.

8 . Winter mortality data

[Winter mortality in England and Wales: 2021 to 2022 \(provisional\) and 2020 to 2021 \(final\)](#) Dataset | Released 19 January 2023 Annual figures of winter mortality in England and Wales by sex, age, cause of death, region, place of death and lower geographical areas.

9 . Glossary

Winter deaths compared to non-winter deaths

This is a measure of the difference in mortality during winter months (December to March) compared with non-winter months (the preceding August to November and following April to July).

Winter mortality index

This shows the percentage of additional deaths that occurred in the winter and is calculated so that comparisons can be made between sexes, age groups and geographical areas.

Coronavirus (COVID-19) deaths

Coronavirus (COVID-19) deaths are those deaths registered in England and Wales where COVID-19 was mentioned on the death certificate. A doctor can certify the involvement of COVID-19 based on symptoms and clinical findings - a positive test result is not required.

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 figures indicate the difference is unlikely to have arisen from random fluctuation.

10 . Measuring the data

This statistical bulletin presents provisional figures for the period 2021 to 2022 and final figures for the period 2020 to 2021 in England and Wales. Historical trends are provided for comparison.

Figures for England and Wales are calculated using death occurrence data held by the Office for National Statistics (ONS). Mortality statistics are compiled from information supplied when deaths are certified and registered as part of civil registration. See more information in our [Winter mortality in England and Wales QMI](#).

Our [User guide to mortality statistics](#) provides further information on the collection, production and quality of mortality data.

Calculating winter deaths compared to non-winter deaths

Our method compares the number of death occurrences in the winter period (December to March) with the average number of death occurrences in the preceding August to November and the following April to July. The calculation used is:

$$\text{Winter deaths compared to non winter deaths} = \text{winter deaths} - \text{average non winter deaths}$$

Provisional figures are produced for the most recent winter using estimation methods to adjust for late registrations and are rounded to the nearest 100 deaths. Final figures are rounded to the nearest 10 deaths.

Calculating winter mortality (WM) index

This measure is expressed as a percentage and is calculated so that comparisons can be made between groups. The calculation used is:

$$\text{WM Index} = \frac{\text{Winter deaths compared to non winter deaths}}{\text{Average non winter deaths}} \times 100$$

The WM index is presented with 95% confidence intervals, which are calculated as:

$$95\% \text{ CI} = \text{WM Index} \pm 1.96 \times \left[\frac{\text{WM Index}}{\sqrt{\text{Winter deaths compared to non winter deaths}}} \right]$$

The WM index and confidence intervals are reported to one decimal place.

Early access for quality assurance purposes

We provide early access for quality assurance purposes to a small number of analysts within the UK Health Security Agency (UKHSA), Public Health Wales, and the Welsh Government. The analysts are not permitted to share the findings or the bulletin wider in their organisations. The bulletin is provided for technical epidemiological comment. However, the ONS independently produces these statistics, including determining the focus and content of the bulletin.

11 . Strengths and limitations

The strengths of the winter mortality bulletin are the fact that mortality data give complete population coverage, which ensure the estimates are of high precision, and representative of the underlying population at risk.

However, its limitations are that provisional death occurrences data are used to generate the data, which means data are always somewhat incomplete because of registration delays.

12 . Related links

[Deaths registered in England and Wales: 2021](#) Bulletin | Released 1 July 2022 Registered deaths by age, sex, selected underlying causes of death and the leading causes of death.

[Deaths registered weekly in England and Wales, provisional](#) Bulletin | Updated every Tuesday Provisional counts of the number of deaths registered in England and Wales, including deaths involving coronavirus (COVID-19), in the latest weeks for which data are available.

[Monthly mortality analysis, England and Wales](#) Bulletin | Released every month Provisional death registration data for England and Wales, broken down by sex, age and country.

[Winter mortality in Northern Ireland 2021/22](#) Bulletin | Released 15 December 2022 Figures for winter mortality in Northern Ireland for winter 2021 to 2022 and earlier years.

[Winter mortality in Scotland 2021/2022](#) Bulletin | Released 27 October 2022 Figures for winter mortality in Scotland for winter 2021 to 2022 and earlier years.

13 . Cite this statistical bulletin

Office for National Statistics (ONS), released 19 January 2023, ONS website, statistical bulletin, [Winter mortality in England and Wales: 2021 to 2022 \(provisional\) and 2020 to 2021 \(final\)](#)