

Statistical bulletin

Excess winter mortality in England and Wales: 2020 to 2021 (provisional) and 2019 to 2020 (final)

More people die in the winter than the summer. We present data by sex, age, region, cause of death and place of death.



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1 . Main points

- An estimated 63,000 excess winter deaths occurred in England and Wales in winter 2020 to 2021, 6.1 times higher than winter 2019 to 2020; the growth was mostly driven by the large number of coronavirus (COVID-19) deaths in the non-winter months of 2020 (April to July) and the winter months of 2021 (December to March)."
- The excess winter mortality index (EWMI) in England was significantly higher than all winters since the series began in 1991 to 1992.
- In Wales the EWMI was significantly higher than every winter since 1991 to 1992 except 2017 to 2018.
- COVID-19 was the leading cause of excess winter mortality in 2020 to 2021, accounting for 84.0% (England) and 82.9% (Wales) of all excess winter deaths.

Figures in this bulletin include COVID-19 deaths. Figures excluding and including deaths involving COVID-19 for the 2019 to 2020 winter period are provided in the [accompanying dataset](#).

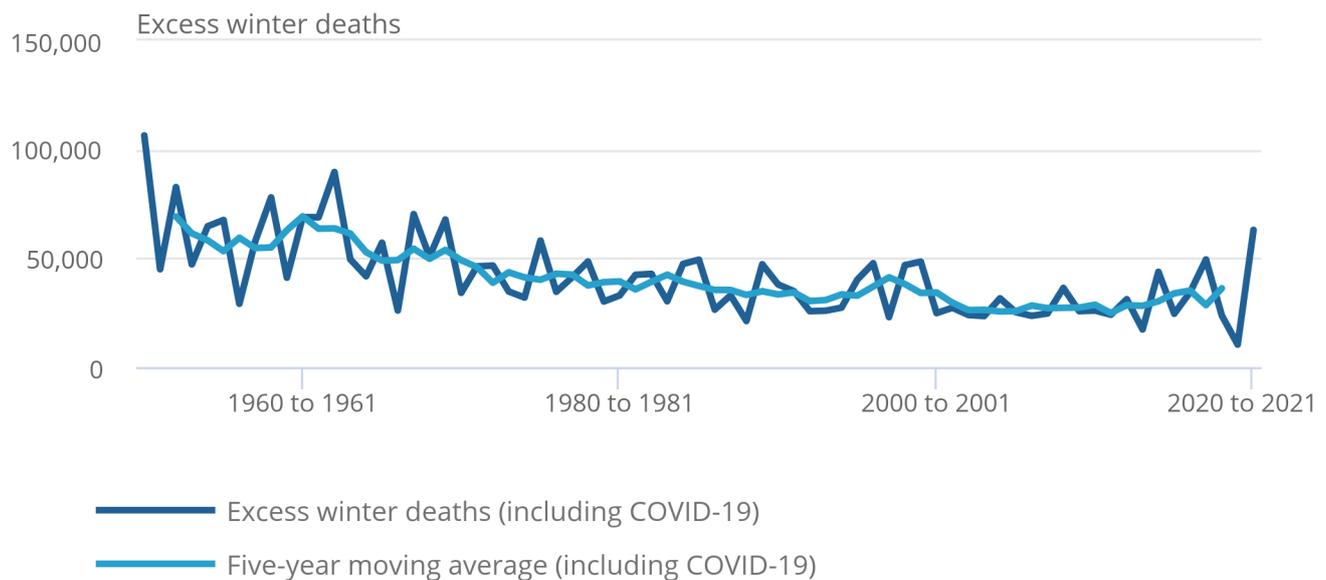
2 . Overview of excess winter mortality in England and Wales

Figure 1: Excess winter deaths in 2020 to 2021 were the highest since 1969 to 1970

Excess winter deaths and five-year central moving average, England and Wales, occurring between 1950 to 1951 and 2020 to 2021

Figure 1: Excess winter deaths in 2020 to 2021 were the highest since 1969 to 1970

Excess winter deaths and five-year central moving average, England and Wales, occurring between 1950 to 1951 and 2020 to 2021



Source: Office for National Statistics

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July).
2. Numbers of deaths from January to July 2021 are provisional and adjusted for late registrations.
3. Figures include deaths of non-residents.
4. Central moving averages were calculated using the winter period of interest and the two winter periods before and after.

The purpose of the excess winter mortality (EWM) 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); further details of its calculation can be found in the [Excess winter mortality in England and Wales QMI](#).

In the 2020 to 2021 winter period (December 2020 to March 2021), 63,000 excess winter deaths (EWD) occurred in England and Wales (Figure 1). This was 6.1 times higher than the 10,320 EWD observed in 2019 to 2020, the lowest in the data time series.

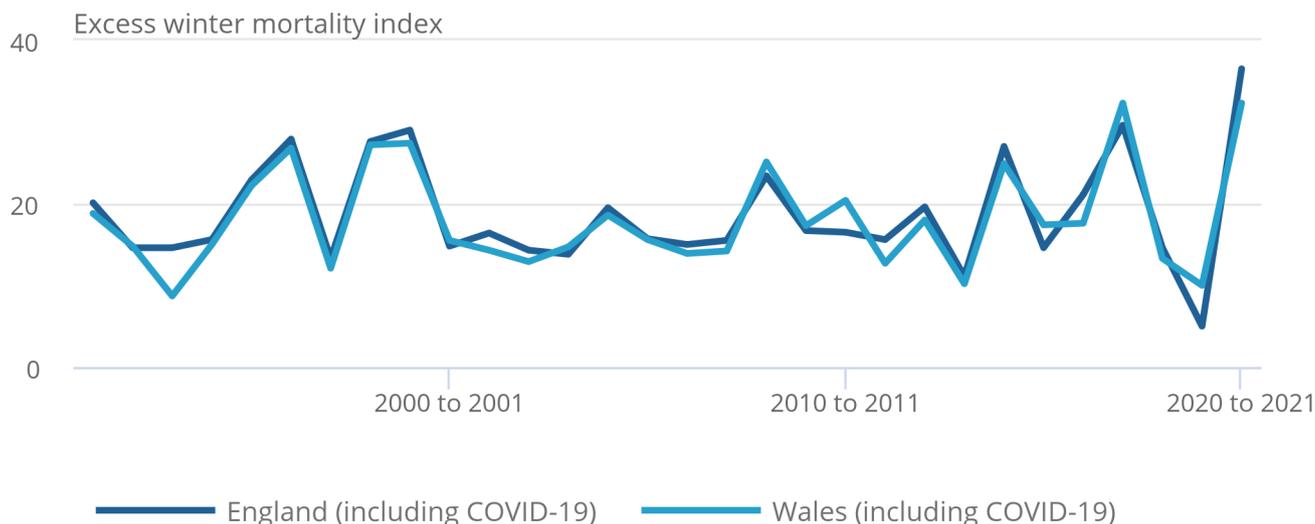
This increase was driven by the large number of deaths involving coronavirus (COVID-19) in the non-winter months of 2020 and the winter months of 2021. For comparison, there were 29,290 EWD excluding COVID-19 in 2019 to 2020.

Figure 2: The excess winter mortality index in 2020 to 2021 was the highest since the data time series began in England

Excess winter mortality index by country, England and Wales, occurring between 1991 to 1992 and 2020 to 2021

Figure 2: The excess winter mortality index in 2020 to 2021 was the highest since the data time series began in England

Excess winter mortality index by country, England and Wales, occurring between 1991 to 1992 and 2020 to 2021



Source: Office for National Statistics

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July).
2. Numbers of deaths from January to July 2021 are provisional and adjusted for late registrations.
3. Figures exclude deaths of non-residents.
4. Figures by country are not available before 1981 and have been provided back to 1991 to 1992 to allow 30 years of comparison.

The excess winter mortality index (EWMI) in 2020 to 2021 showed that 36.5% and 32.3% more deaths occurred in the winter months compared with the non-winter months in England and Wales respectively (Figure 2). The EWMI for England was significantly higher than all periods since 1991. For Wales, the latest EWMI is also significantly higher than every period since 1991 to 1992 except 2017 to 2018.

3 . Daily and weekly deaths

Figure 3a: Daily winter deaths in England were higher than the five-year average until the end of February

Number of daily deaths, five-year average daily deaths, and weekly deaths with coronavirus (COVID-19) as underlying cause of death, England, occurring between August 2020 and July 2021

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July).
2. Numbers of deaths from January to July 2021 are provisional and adjusted for late registrations.
3. Figures exclude deaths of non-residents.
4. Five-year averages are calculated using 2015 to 2019 data.
5. Weeks run from Monday to Sunday.
6. The International Classification of Diseases, 10th edition (ICD-10) definitions are; COVID-19 (U07.1, U07.2, and U10.9).

[Download the data](#)

Figure 3b: Daily winter deaths in Wales were higher than the five-year average in December, January and most of February

Number of daily deaths, five-year average daily deaths, and weekly deaths with coronavirus (COVID-19) as underlying cause of death, Wales, occurring between August 2020 and July 2021

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July).
2. Numbers of deaths from January to July 2021 are provisional and adjusted for late registrations.
3. Figures exclude deaths of non-residents.
4. Five-year averages are calculated using 2015 to 2019 data.
5. Weeks run from Monday to Sunday.
6. The International Classification of Diseases, 10th edition (ICD-10) definitions are; COVID-19 (U07.1, U07.2, and U10.9).

[Download the data](#)

For the 2020 to 2021 winter period in England, daily deaths peaked on 19 January 2021 (Figure 3a); this is slightly later than in previous winters. The five-year average shows an increase in deaths normally occurs towards the beginning of January. In Wales, daily deaths peaked on 11 January 2021 (Figure 3b).

The number of daily deaths during the 2020 to 2021 winter was above the five-year average for much of the period in England and Wales (87 and 86 out of 121 days respectively). This was driven by December to February where the majority were above the average.

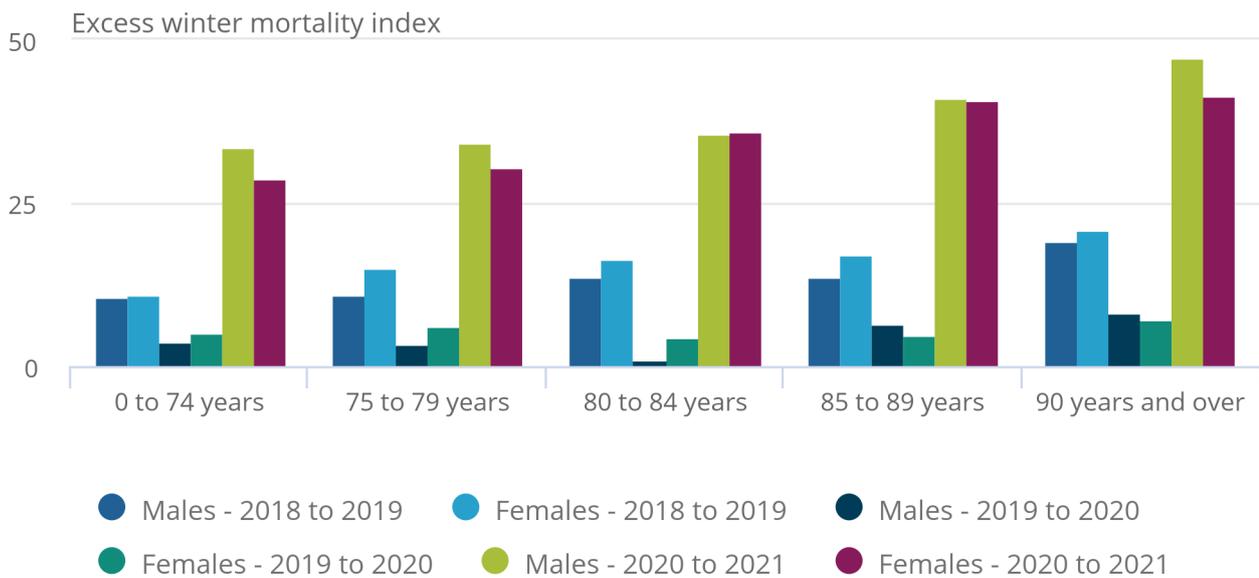
4 . Excess winter mortality by sex and age

Figure 4a: The excess winter mortality index in England during 2020 to 2021 was significantly higher than the previous two years

Excess winter mortality index by age group and sex, England, occurring between 2018 to 2019 and 2020 to 2021

Figure 4a: The excess winter mortality index in England during 2020 to 2021 was significantly higher than the previous two years

Excess winter mortality index by age group and sex, England, occurring between 2018 to 2019 and 2020 to 2021



Source: Office for National Statistics

Notes:

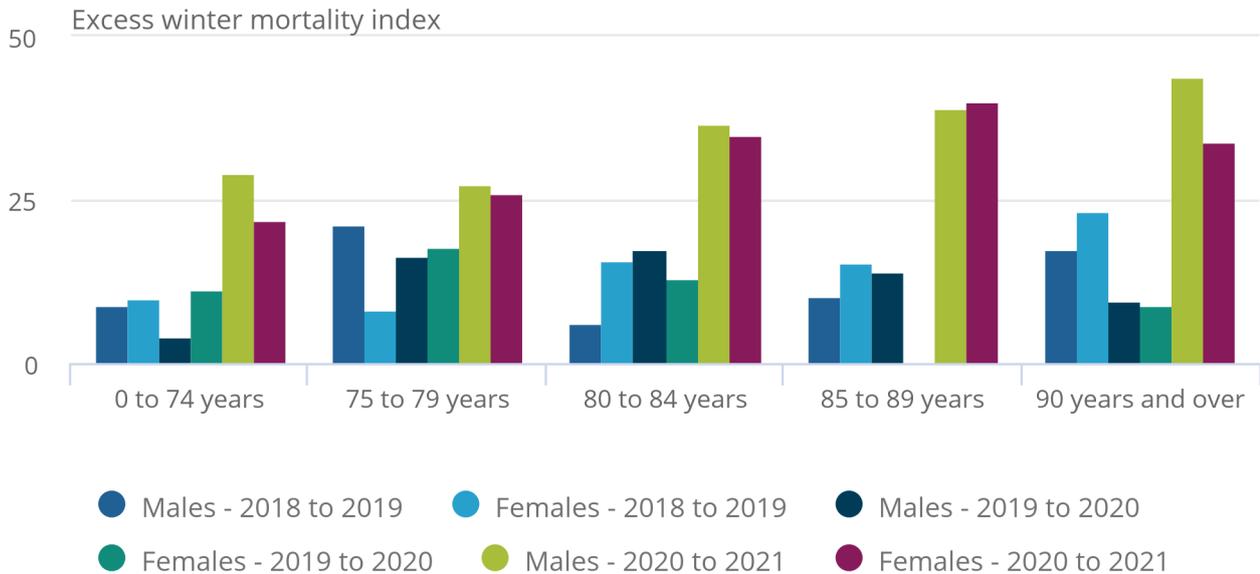
1. Figures are based on deaths occurring in each period (August through to the following July).
2. Numbers of deaths from January to July 2021 are provisional and adjusted for late registrations.
3. Figures exclude deaths of non-residents.

Figure 4b: The excess winter mortality index in Wales during 2020 to 2021 was significantly higher than the previous two years except for in males aged 75 to 79 years

Excess winter mortality index by age group and sex, Wales, occurring between 2018 to 2019 and 2020 to 2021

Figure 4b: The excess winter mortality index in Wales during 2020 to 2021 was significantly higher than the previous two years except for in males aged 75 to 79 years

Excess winter mortality index by age group and sex, Wales, occurring between 2018 to 2019 and 2020 to 2021



Source: Office for National Statistics

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July).
2. Numbers of deaths from January to July 2021 are provisional and adjusted for late registrations.
3. Figures exclude deaths of non-residents.

In comparison with the two previous winter periods, the excess winter mortality index in England and Wales significantly increased across all age groups for both sexes in 2020 to 2021, except for males aged 75 to 79 years in Wales where the increase was not significant between 2018 to 2019 and 2020 to 2021 (Figures 4a and 4b).

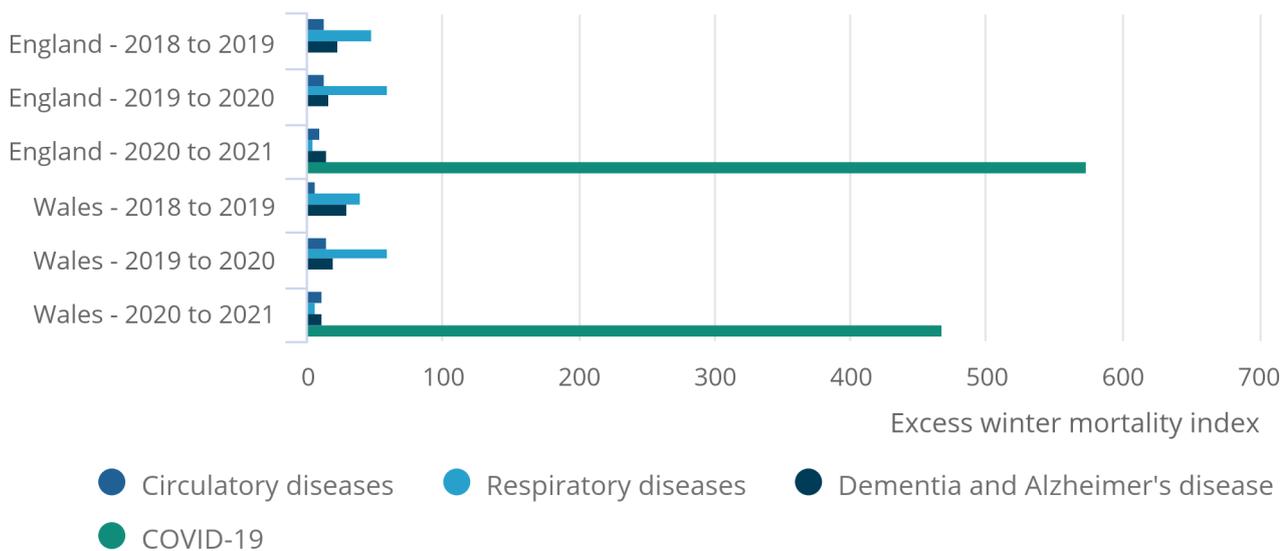
5 . Excess winter mortality by cause of death

Figure 5: Excess winter mortality index for COVID-19 was significantly higher than other causes

Excess winter mortality index by underlying cause of death and country, England and Wales, occurring between 2018 to 2019 and 2020 to 2021

Figure 5: Excess winter mortality index for COVID-19 was significantly higher than other causes

Excess winter mortality index by underlying cause of death and country, England and Wales, occurring between 2018 to 2019 and 2020 to 2021



Source: Office for National Statistics

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July).
2. Numbers of deaths from January to July 2021 are provisional and adjusted for late registrations.
3. Figures exclude deaths of non-residents.
4. 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).
5. For instances where the excess winter deaths are negative or zero, an excess winter mortality index is not presented.

Coronavirus (COVID-19) was the leading cause of excess winter mortality (EWM) during 2020 to 2021 (Figure 5), accounting for 84.0% (England) and 82.9% (Wales) of all excess winter deaths. There were 574.1% (49,200) and 467.5% (2,900) more deaths in the winter period than the non-winter period in England and Wales respectively.

After COVID-19, Dementia and Alzheimer's disease had the highest EWM index in 2020 to 2021, with 15.7% (2,700) and 12.3% (100) more deaths occurring in the winter months than the non-winter months in England and Wales respectively.

Comparative figures for circulatory and respiratory diseases were 10.5% (4,100) and 5.0% (800) in England and 12.1% (300) and 7.4% (100) in Wales, respectively.

6 . Excess winter mortality across regions of England and in Wales

Figure 6: London had the highest excess winter mortality index in 2020 to 2021

Excess winter mortality index for regions of England and in Wales, occurring between 2020 and 2021

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July).
2. Numbers of deaths from January to July 2021 are provisional and adjusted for late registrations.
3. Figures exclude deaths of non-residents.
4. Figures are based on boundaries as of August 2021.

[Download the data](#)

In 2020 to 2021, the highest excess winter mortality index (EWMI) was in London (62.6%), followed by the East (49.2%) and South East (47.9%) (Figure 6). The EWMI for these areas was significantly higher than England (36.5%).

7 . Excess winter mortality by place of death

Figure 7: The excess winter mortality index was highest for hospitals in England and Wales and significantly higher than other places of death in England

Excess winter mortality index and five-year averages by place of death, England and Wales, 2020 to 2021

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July).
2. Numbers of deaths from January to July 2021 are provisional and adjusted for late registrations.
3. Figures exclude deaths of non-residents.
4. Five-year averages are calculated using 2015 to 2019 data.
5. The "other" category encompasses elsewhere, other communal establishments and hospices.
6. For instances where the excess winter deaths are negative or zero, an excess winter mortality index is not presented.

[Download the data](#)

In the winter of 2020 to 2021, most excess winter deaths were in hospitals in England (36,500) and Wales (2,100), with 54.7% and 39.1% more deaths occurring in the winter than the non-winter months in England and Wales respectively (Figure 7).

In England, the excess winter mortality index (EWMI) for hospitals was significantly higher than other places of death, whereas in Wales there was no significant difference between hospitals and care homes.

The EWMI for all places of death except "other" in Wales was significantly higher than the five-year average.

The [accompanying dataset](#) provides details on weekly deaths, influenza-like illness consultation rates, and temperature.

8 . Excess winter mortality data

[Excess winter mortality in England and Wales: 2020 to 2021 \(provisional\) and 2019 to 2020 \(final\)](#)

Dataset | Released 26 November 2021

Annual figures of excess winter mortality in England and Wales by sex, age group, cause, region, place of death and lower geographical areas.

9 . Glossary

Excess winter deaths (EWD)

The number of excess winter deaths (EWD) is a statistical measure of the increase in mortality during winter months (December to March) compared with non-winter months (the preceding August to November and following April to July).

Excess winter mortality index (EWMI)

The excess winter mortality index (EWMI) is calculated so that comparisons can be made between sexes, age groups and geographical areas. It is calculated as the number of excess winter deaths (EWD) divided by the average non-winter deaths, expressed as a percentage.

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 excess winter deaths (EWD) and the excess winter mortality index (EWMI) in England and Wales for the winter period 2020 to 2021 and final figures for the winter period 2019 to 2020. Historical trends are provided for comparison. Figures are presented by sex, age, cause of death, region, and place of death.

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 the [Excess winter mortality in England and Wales QMI](#).

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

Method for calculating excess winter deaths

In line with [previous research](#), our standard method defines the winter period as December to March and compares the number of deaths that occurred in this winter period with the average number of deaths occurring in the preceding August to November and the following April to July. The calculation used is:

$$\text{EWD} = \text{winter deaths} - \text{average non winter deaths}$$

This produces the number of EWD. Provisional EWD figures are produced for the most recent winter using special estimation methods to adjust for late registrations (see the Excess winter mortality in England and Wales QMI), and are rounded to the nearest 100 deaths. Final EWD figures are rounded to the nearest 10 deaths.

Method for calculating excess winter mortality index

The EWMI is calculated so that comparisons can be made between groups and is calculated as the number of EWD divided by the average non-winter deaths:

$$\text{EWM index} = \frac{\text{EWD}}{\text{average non winter deaths}} \times 100$$

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

$$\text{CI for EWM index} = \text{EWM index} \pm 1.96 \times \left(\frac{\text{EWM index}}{\sqrt{\text{EWD}}} \right)$$

The EWMI shows the percentage of extra deaths that occurred in the winter and is reported to one decimal place.

Because of the coronavirus (COVID-19) pandemic, we have calculated excess winter mortality (EWM) figures including and excluding COVID-19 for the 2019 to 2020 winter period in the [accompanying dataset](#). This is because in 2020 the coronavirus pandemic led to a large increase in deaths, mostly in the non-winter months of April to July, which had an impact on our measure of EWM and disturbed the data time series.

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, Public Health Wales, and the Welsh Government. The analysts are not permitted to share the findings or the report wider in their organisations. The report is provided for the analysts to provide technical epidemiological comment on our findings around mortality, influenza, and weather. However, the ONS independently produces these statistics, including determining the focus and content of the bulletin.

11 . Strengths and limitations

The strengths of the excess winter mortality (EWM) bulletin include the following:

- mortality data give complete population coverage and ensure the estimates are of high precision, and representative of the underlying population at risk

The limitations of the EWM bulletin include the following:

- 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: 2020](#)

Bulletin | Released 6 July 2021

Registered deaths by age, sex, selected underlying causes of death and 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: October 2021](#)

Bulletin | Released 23 November 2021

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

[Excess winter mortality in Northern Ireland 2019 to 2020](#)

Bulletin | Released 18 November 2020

Figures for excess winter mortality in Northern Ireland for winter 2019 to 2020 and earlier years.

[Winter mortality in Scotland 2020 to 2021](#)

Bulletin | Released 12 October 2021

Figures for the seasonal increase in mortality in Scotland for winter 2020 to 2021 and earlier years.