Office for National Statistics

Statistical bulletin

Excess winter mortality in England and Wales: 2019 to 2020 (provisional) and 2018 to 2019 (final)

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

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1 . Main points

- We estimate excess winter mortality by comparing the winter months of December to March with the average of the four-month periods before and after; for winter 2019 to 2020 we have excluded deaths where the coronavirus (COVID-19) was mentioned on the death certificate – which is a new disease – from the main figures reported, improving the comparability of this winter's measure with previous years.
- An estimated 28,300 excess winter deaths occurred in England and Wales in winter 2019 to 2020, which was 19.6% higher than winter 2018 to 2019.
- The excess winter mortality index (which is used to compare between sexes, age groups and geographical areas) in England was statistically significantly higher than for winter 2018 to 2019, but statistically significantly lower than the 2016 to 2017 and 2017 to 2018 winters.
- The excess winter mortality index in Wales was also statistically significantly higher than for winter 2018 to 2019, but statistically significantly lower than the 2017 to 2018 winter.
- Overall, the excess winter mortality index in 2019 to 2020 was higher for males than females, which was the first time since 1994 to 1995 for England and 2015 to 2016 for Wales; those aged 90 years and over continued to have the highest index in England while males aged 80 to 84 years and females aged 75 to 79 years had the highest index in Wales.
- Respiratory diseases continued to be the leading cause of excess winter deaths that occurred in 2019 to 2020.

2 . Overview of excess winter mortality in England and Wales

The mortality data in this bulletin are based on death occurrences (the date on which a death occurred) rather than death registrations (the date on which a death was registered). Provisional excess winter deaths (EWD) data are produced for the most recent winter using special estimation methods to adjust for late registrations.

The purpose of the excess winter mortality (EWM) measure is to compare the number of deaths that occurred in the winter period with the non-winter periods. This enables us to quantify what impact diseases, such as influenza and pneumonia, and weather patterns may have had during the winter season.

In 2020, the coronavirus (COVID-19) pandemic led to a large increase of deaths mostly in the non-winter months of April to July. This has impacted our measure of EWM because we rely on using the difference between deaths occurring in the winter and the average of non-winter months; specifically, the scale of COVID-19 deaths during non-winter months has fundamentally disturbed the data time series.

To account for this and provide a comparative measure of impact, we have calculated EWD and the EWM index using deaths including and excluding COVID-19 separately in this section of the bulletin; the remainder of the analysis within the bulletin is then based on deaths excluding COVID-19 to allow us to compare the excess deaths in 2020 with previous years, when COVID-19 did not exist.

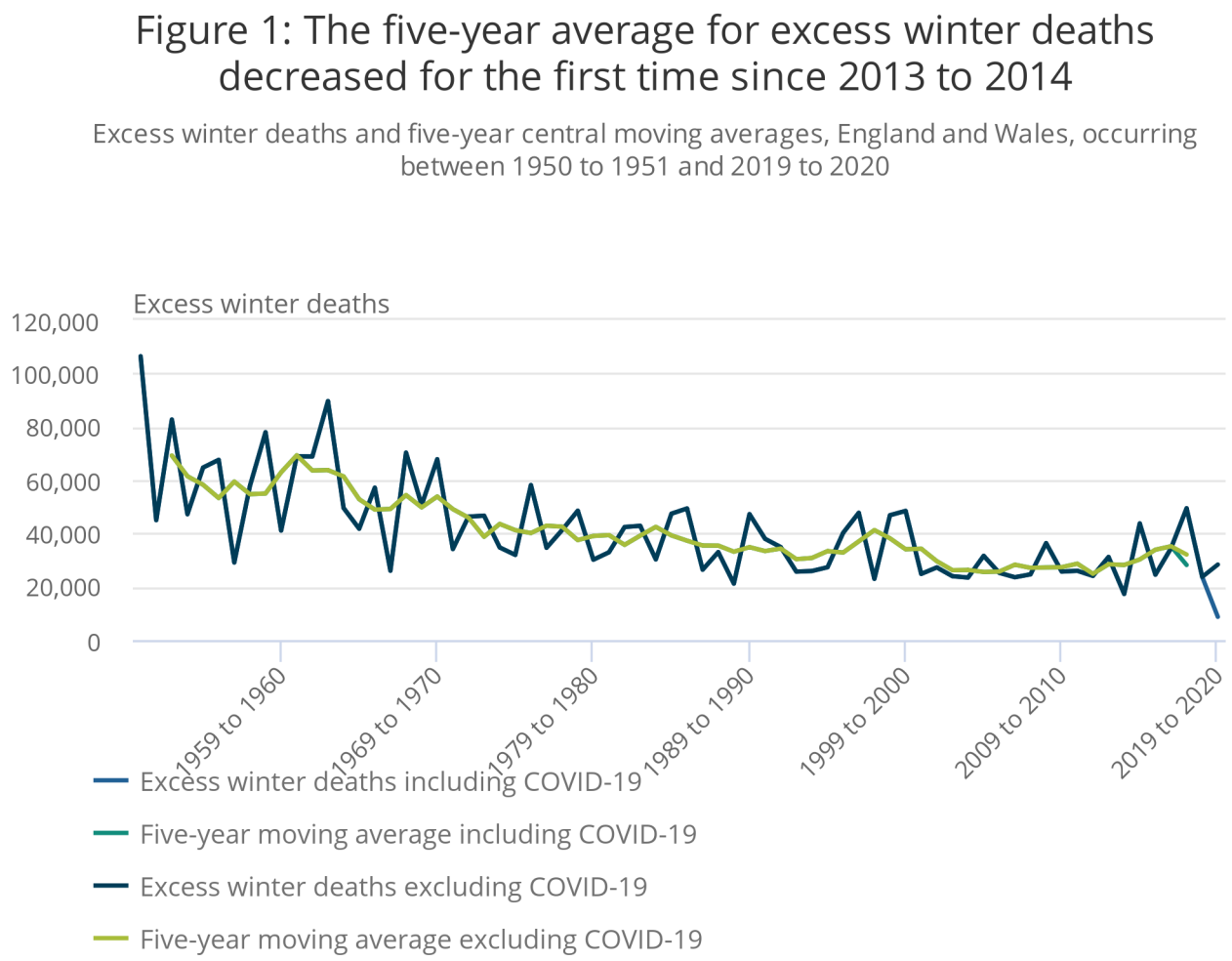
In this bulletin, we use the term "including COVID-19" when referring to all cause deaths including deaths that had COVID-19 mentioned anywhere on the death certificate, whether as an underlying cause of death or not. We use the term "excluding COVID-19" to refer to all cause deaths that did not have COVID-19 mentioned on the death certificate.

When using deaths data excluding COVID-19, in the 2019 to 2020 winter period (December 2019 to March 2020), there were an estimated 28,300 EWD in England and Wales (Figure 1). This was 19.6% higher than the 23,670 observed in the 2018 to 2019 winter period but lower than the 2016 to 2017 and 2017 to 2018 winters.

In contrast, when using deaths data including COVID-19 there were an estimated 8,700 EWD during the 2019 to 2020 winter. This is the lowest number recorded since the data time series began in 1950 to 1951. However, the low estimate is explained by the comparison with the large number of COVID-19 deaths that occurred mainly in the non-winter months April to July, rather than an exceptionally low number of winter deaths.

Figure 1: The five-year average for excess winter deaths decreased for the first time since 2013 to 2014

Excess winter deaths and five-year central moving averages, England and Wales, occurring between 1950 to 1951 and 2019 to 2020



Source: Office for National Statistics - Excess winter mortality

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July). Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.

2. Excess winter deaths (EWD) are calculated as winter deaths minus the average non-winter deaths.

3. Provisional figures for the latest winter are rounded to the nearest 100, figures for all other winters are final and are rounded to the nearest 10.

4. Central moving averages were calculated using the winter period of interest, along with the two winter periods before and two periods after.

5. Figures for England and Wales combined include deaths of non-residents.

6. Figures for excess winter deaths (excluding COVID-19) and five-year moving average (excluding COVID-19) have been calculated using all cause deaths that did not have COVID-19 mentioned on the death certificate. Alternatively, figures for excess winter deaths (including COVID-19) and five-year moving average (including COVID-19) have been calculated using deaths from all causes including those that had COVID-19 mentioned on the death certificate.

7. The International Classification of Diseases, 10th edition (ICD-10) definitions are as follows: coronavirus (COVID-19) (U07.1 and U07.2).

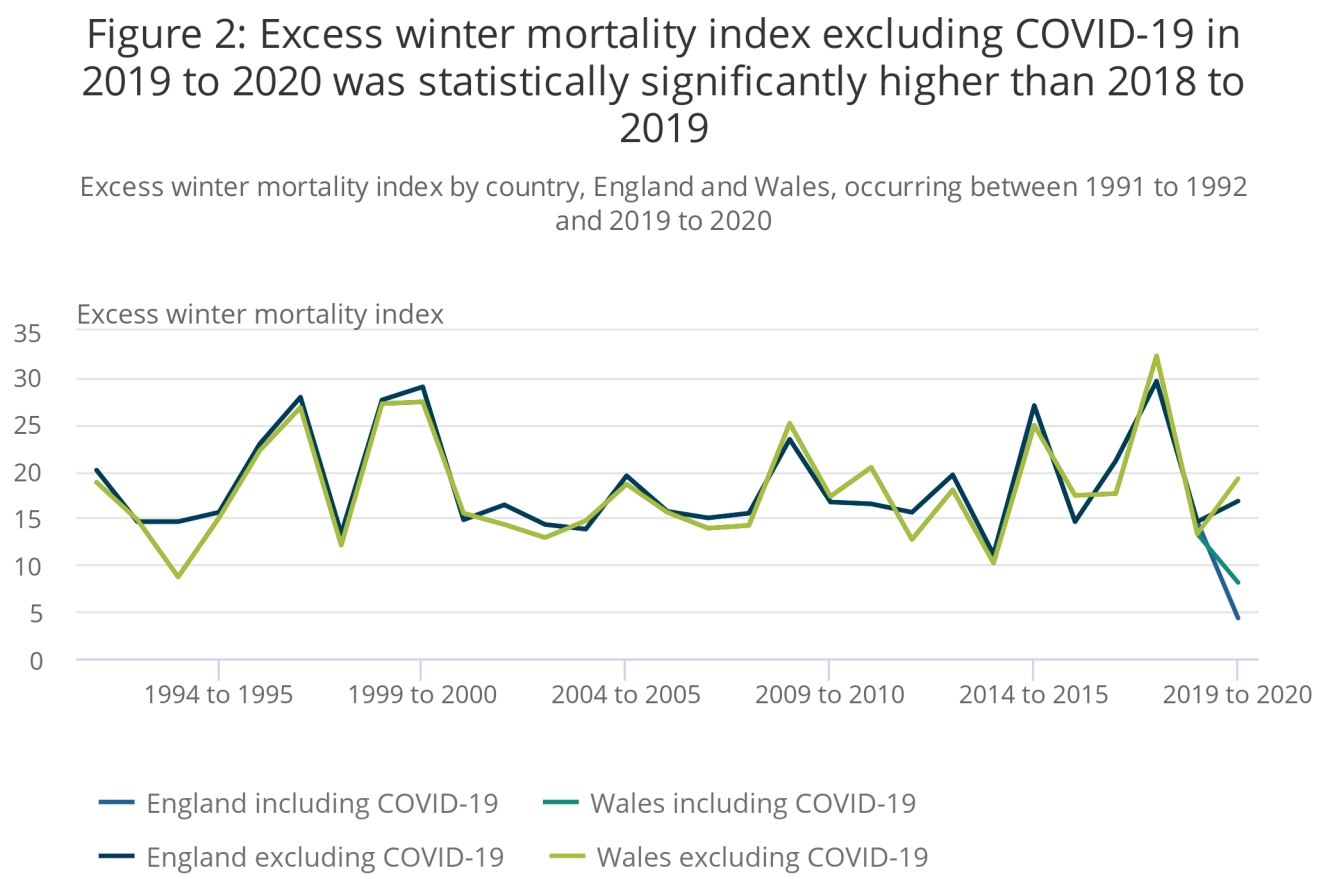
Large fluctuations in EWD between years are common, so a five-year moving average is included in Figure 1 to smooth out short-term fluctuations and make the trend over time clearer. Generally, historical trends in EWD in England and Wales show that the steady decreases since the 1950 to 1951 winter period have levelled off, with the most recent decrease being the first since the 2013 to 2014 winter.

The EWM index in 2019 to 2020 for deaths excluding COVID-19 showed that 16.8% more deaths occurred in the winter months in England compared with the non-winter months, while 19.2% more deaths occurred in the winter months in Wales compared with the non-winter months (Figure 2). The most recent EWM indexes for England and Wales were statistically significantly higher than for winter 2018 to 2019 but statistically significantly lower than the 2016 to 2017 and 2017 to 2018 winters for England, and statistically significantly lower than the 2017 to 2018 winter for Wales.

In contrast, the EWM index in 2019 to 2020 for deaths including COVID-19 showed 4.3% and 8.1% more deaths occurring in the winter months than the non-winter months in England and Wales respectively. For England, this index was statistically significantly lower than all years since the data time series began in 1991 to 1992 and for Wales it was statistically significantly lower than all winter periods except 1993 to 1994.

Figure 2: Excess winter mortality index excluding COVID-19 in 2019 to 2020 was statistically significantly higher than 2018 to 2019

Excess winter mortality index by country, England and Wales, occurring between 1991 to 1992 and 2019 to 2020



Source: Office for National Statistics - Excess winter mortality

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July). Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.

2. The excess winter mortality (EWM) index is calculated as excess winter deaths (EWD) divided by the average non-winter deaths, expressed as a percentage.

3. Figures for England and Wales exclude deaths of non-residents.

4. Figures for EWM index (excluding COVID-19) have been calculated using all cause deaths that did not have COVID-19 mentioned on the death certificate. Alternatively, figures for EWM index (including COVID-19) have been calculated using deaths from all causes including those that had COVID-19 mentioned on the death certificate.

5. The International Classification of Diseases, 10th edition (ICD-10) definitions are as follows: coronavirus (COVID-19) (U07.1 and U07.2).

Deaths including COVID-19 produce lower EWD and EWM indexes because most of these deaths occurred in the non-winter months. However, this does not provide an accurate picture of the effect winter has on the number of deaths. Because of this, the rest of the analysis will focus on deaths excluding COVID-19.

3 . Daily deaths

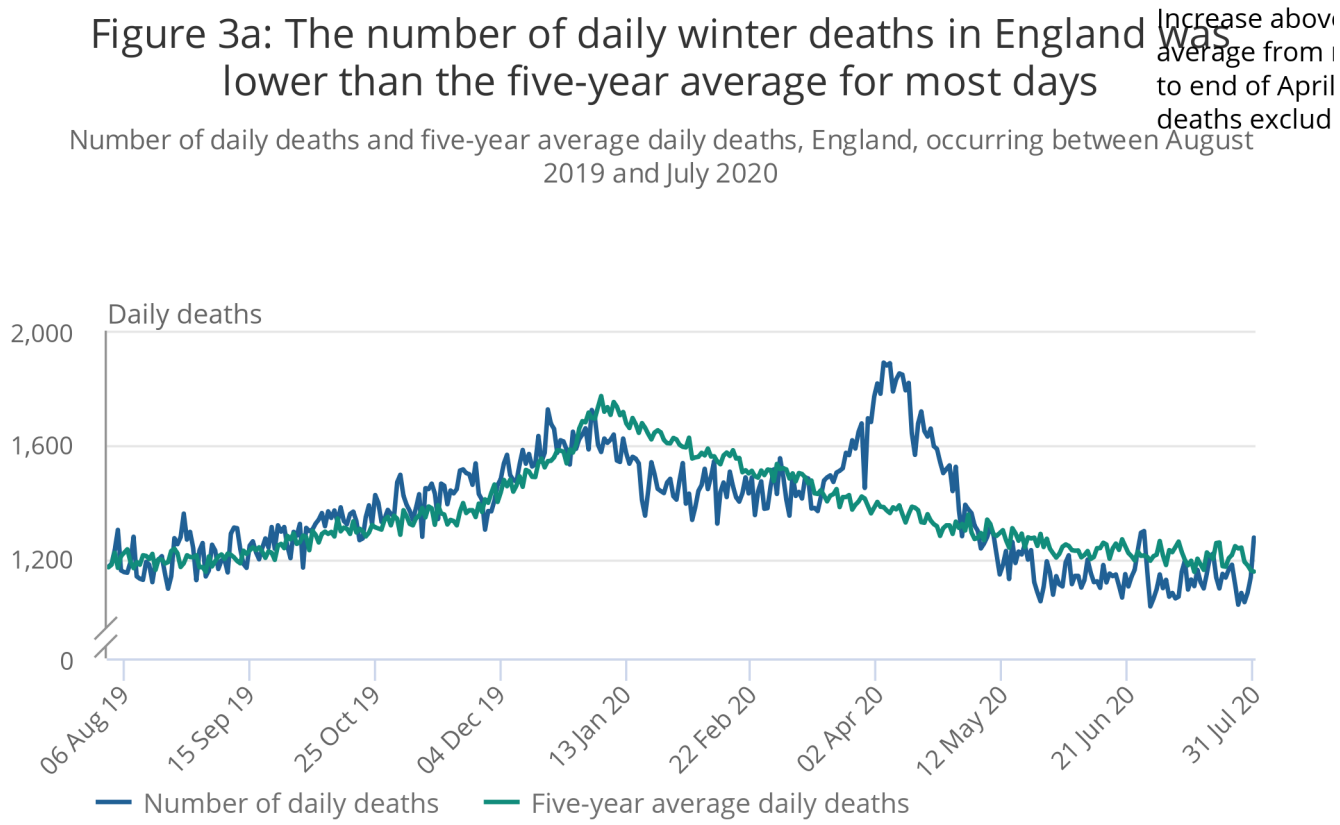
England

For the 2019 to 2020 winter period in England, the highest peak in daily deaths occurred on 19 December 2019 (Figure 3a). This peak is slightly earlier than in previous winters where an increase in deaths normally occurs towards the beginning of January, as observed by the five-year average.

The number of daily deaths during the 2019 to 2020 winter was below the five-year average for much of the period (78 out of 122 days). This was driven by January and February where 57 of the 60 days were below the average. The number of deaths during the non-winter months of August to November was above the five-year average for most of the period (86 out of 122 days), while the number of deaths during the non-winter months of April to July was below the five-year average for the majority of the period (83 out of 122 days). There is a noticeable large peak in deaths above the five-year average from mid-March to end of April. It is important to note that these figures exclude coronavirus (COVID-19) deaths. This observed increase is because of “excess non-COVID-19 deaths” that occurred during the first wave of the pandemic, which has been explored in Analysis of death registrations not involving coronavirus (COVID-19), England and Wales.

Figure 3a: The number of daily winter deaths in England was lower than the five-year average for most days

Number of daily deaths and five-year average daily deaths, England, occurring between August 2019 and July 2020



Source: Office for National Statistics - Excess winter mortality

Notes:

1. Figures are based on deaths occurring each day. Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.
2. Five-year averages for each day are calculated using data from the previous five years excluding the current year.
3. Figures for England exclude deaths of non-residents.
4. Figures are based on deaths from all causes excluding those that had COVID-19 mentioned on the death certificate.

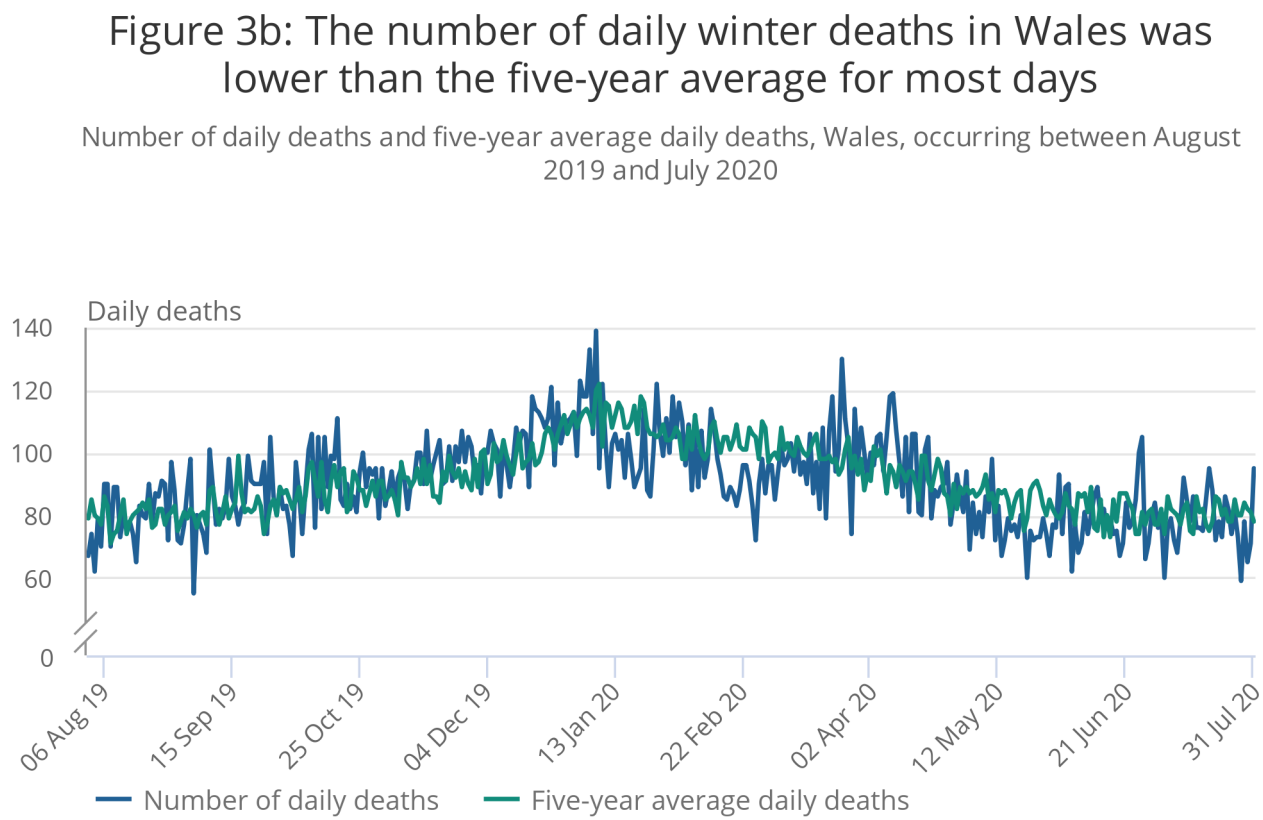
Wales

In Wales, the highest peak in daily deaths during the 2019 to 2020 winter period was on 7 January 2020 (Figure 3b). The number of daily deaths during the 2019 to 2020 winter was below the five-year average throughout most of the period (75 out of 122 days).

Like England, the number of deaths in the non-winter months of August to November in Wales was above the five-year average for more of the period (65 out of 122 days), while the number of deaths during the non-winter months of April to July was below the five-year average for the majority of days (80 out of 122 days).

Figure 3b: The number of daily winter deaths in Wales was lower than the five-year average for most days

Number of daily deaths and five-year average daily deaths, Wales, occurring between August 2019 and July 2020



Source: Office for National Statistics - Excess winter mortality

Notes:

1. Figures are based on deaths occurring each day. Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.

2. Five-year averages for each day are calculated using data from the previous five years excluding the current year.

3. Figures for Wales exclude deaths of non-residents.

4. Figures are based on deaths from all causes excluding those that had COVID-19 mentioned on the death certificate.

The decrease in daily deaths across England and Wales during the winter of 2019 to 2020 coincided with above-average winter temperatures and low to medium levels of influenza activity in England and Wales (PDF, 2.22MB).

4 . Excess winter mortality by sex and age

As detailed in Section 2, the data in this section exclude deaths where the coronavirus (COVID-19) was mentioned on the death certificate.

England

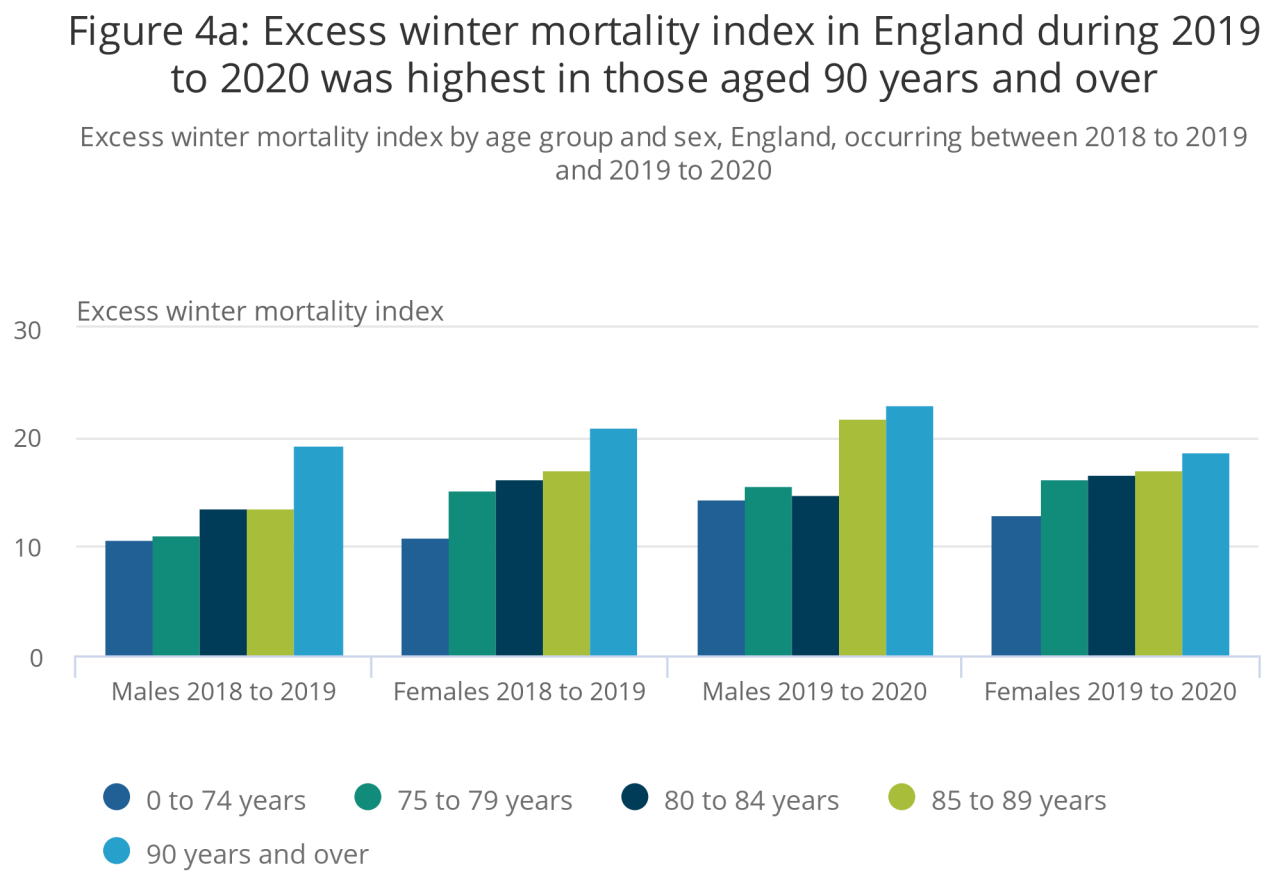
In England, there were an estimated 26,500 excess winter deaths (EWD) in 2019 to 2020, with 50.2% among males (13,300) and 49.4% among females (13,100).

In comparison with the previous winter period, the excess winter mortality (EWM) index in England increased for males across all age groups, with the rise being statistically significant for all ages except those aged 80 to 84 years. For females, the EWM index increased for most age groups, but only statistically significantly for those aged 0 to 74 years. In contrast, the index for females aged 90 years and over had a statistically significant decrease, from 20.9% in 2018 to 2019, to 18.8% in 2019 to 2020.

The highest EWM index during 2019 to 2020 was for males and females aged 90 years and over (23.0% and 18.8% respectively), which was statistically significantly higher than all other ages except for males aged 85 to 89 years.

Figure 4a: Excess winter mortality index in England during 2019 to 2020 was highest in those aged 90 years and over

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



Source: Office for National Statistics - Excess winter mortality

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July). Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.

2. The excess winter mortality (EWM) index is calculated as excess winter deaths (EWD) divided by the average non-winter deaths, expressed as a percentage.

3. Figures for England exclude deaths of non-residents.

4. Figures are based on deaths from all causes excluding those that had COVID-19 mentioned on the death certificate.

Wales

In Wales, there were an estimated 2,000 EWD in 2019 to 2020, which was split evenly between males and females (1,000 each).

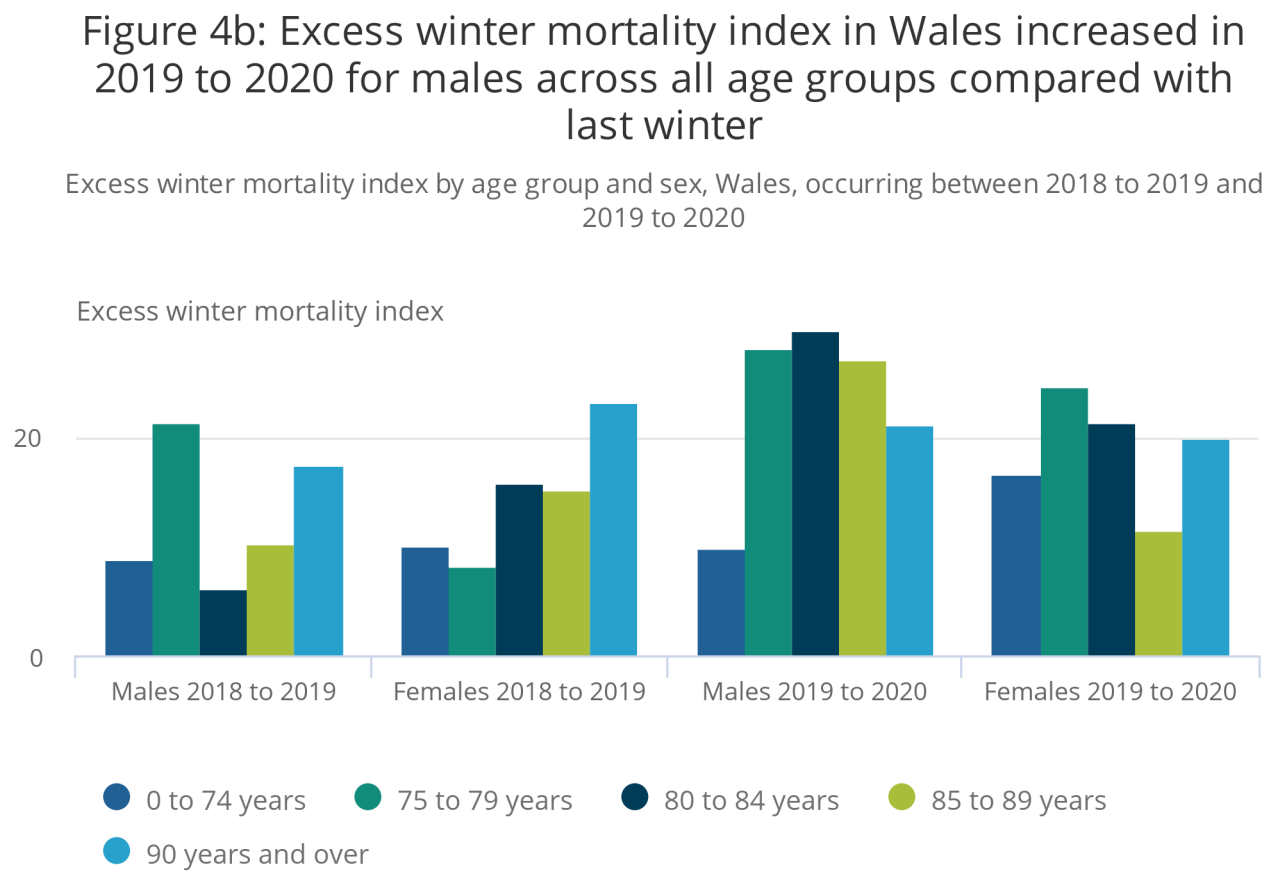
In comparison with the previous winter period, the EWM index in Wales increased across all age groups for males, however, this was only statistically significant for those aged 80 to 84 years and 85 to 89 years. The highest EWM index for males was for those aged 80 to 84 years (29.7%) and was statistically significantly higher than those aged 0 to 74 years and 90 years and over.

For females, the EWM index increased for those aged 0 to 74 years, 75 to 79 years and 80 to 84 years; however, this was only statistically significant for those aged 0 to 74 years and 75 to 79 years. The highest EWM index was for those aged 75 to 79 years (24.7%) and was statistically significantly higher than those aged 0 to 74 years and 85 to 89 years.

It is important to note that there are far fewer deaths in Wales than in England, therefore the EWM index tends to show more fluctuation between winter periods for Wales.

Figure 4b: Excess winter mortality index in Wales increased in 2019 to 2020 for males across all age groups compared with last winter

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



Source: Office for National Statistics - Excess winter mortality

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July). Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.

2. The excess winter mortality (EWM) index is calculated as excess winter deaths (EWD) divided by the average non-winter deaths, expressed as a percentage.

3. Figures for Wales exclude deaths of non-residents.

4. Figures are based on deaths from all causes excluding those that had COVID-19 mentioned on the death certificate.

5 . Excess winter mortality by cause of death

As detailed in Section 2, the data in this section exclude deaths where the coronavirus (COVID-19) was mentioned on the death certificate.

Figure 5 presents the excess winter mortality (EWM) index by the three leading causes of death: circulatory diseases (defined as International Classification of Diseases, 10th Revision (ICD-10) codes I00 to I99), respiratory diseases (defined as ICD-10 codes J00 to J99) and dementia and Alzheimer's disease (defined as ICD-10 codes F01, F03 and G30).

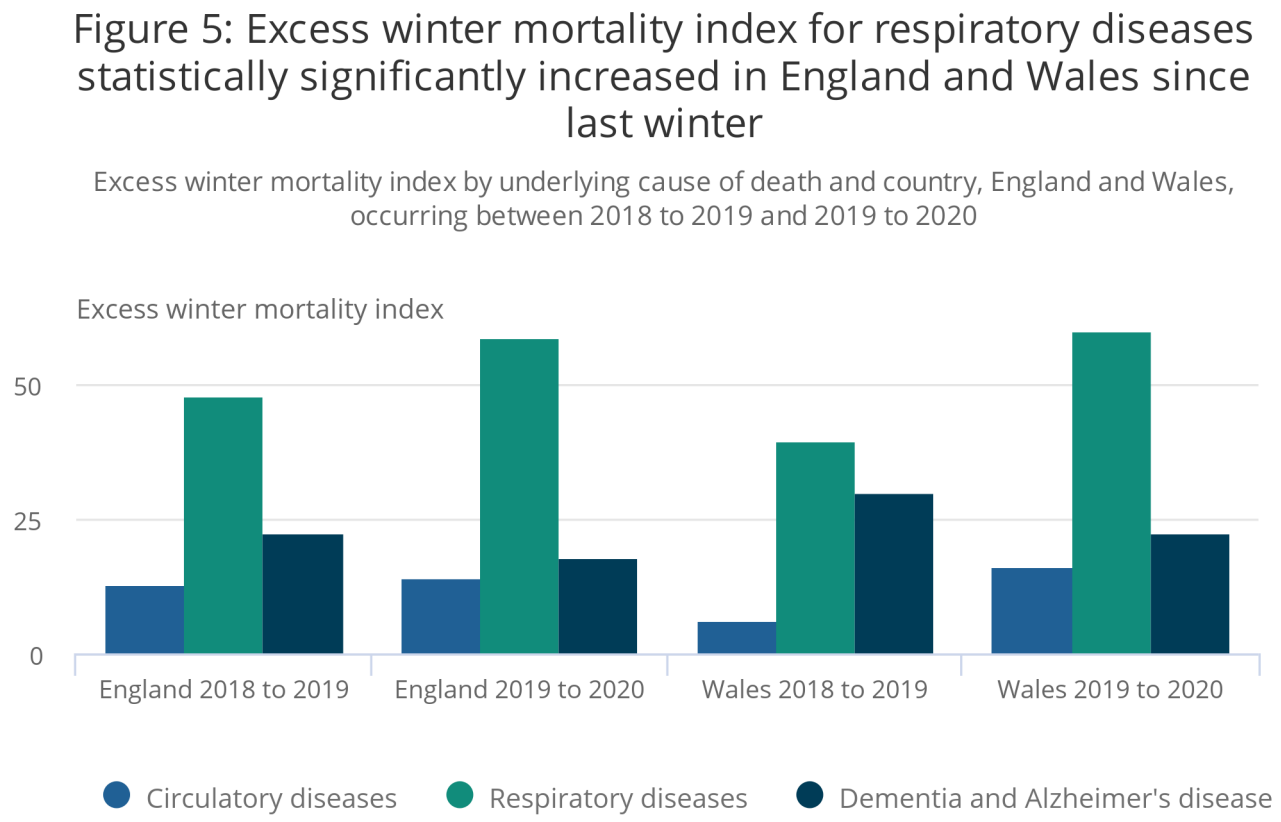
Respiratory diseases

Respiratory diseases remained the leading cause of EWM during 2019 to 2020, accounting for 39.6% (England) and 40.0% (Wales) of all excess winter deaths (EWD), with 59.1% (10,500) and 60.2% (800) more deaths in the winter period than the non-winter period in England and Wales respectively. The EWM index for respiratory diseases was statistically significantly higher than 2018 to 2019, but statistically significantly lower than 2017 to 2018 in both countries.

Of these excess respiratory deaths, chronic lower respiratory diseases (defined as ICD-10 codes J40 to J47) and pneumonia (defined as ICD-10 codes J12 to J18) accounted for the largest proportions. During 2019 to 2020, chronic lower respiratory diseases had 53.5% (4,300) and 56.9% (300) more deaths in the winter period than the non-winter period in England and Wales respectively. Pneumonia accounted for 67.3% (3,900) and 69.1% (300) more deaths in the winter period than the non-winter period in England and Wales respectively.

Figure 5: Excess winter mortality index for respiratory diseases statistically significantly increased in England and Wales since last winter

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



Source: Office for National Statistics - Excess winter mortality

Notes:

1. The International Classification of Diseases, 10th edition (ICD-10) definitions are as follows; circulatory diseases (I00 to I99), respiratory diseases (J00 to J99) and dementia and Alzheimer's disease (F01, F03 and G30).

2. Figures are based on deaths occurring in each period (August through to the following July). Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.

3. The excess winter mortality (EWM) index is calculated as excess winter deaths (EWD) divided by the average non-winter deaths, expressed as a percentage.

4. Figures for England and Wales exclude deaths of non-residents.

5. Figures are based on deaths excluding those that had COVID-19 mentioned on the death certificate.

Dementia and Alzheimer's disease

Dementia and Alzheimer's disease accounted for 14.7% and 15.0% of all EWD in the winter of 2019 to 2020, with 18.1% (3,900) and 22.4% (300) more deaths occurring in the winter months than the non-winter months in England and Wales respectively. For England, the EWM index was statistically significantly lower than all periods since 1998 to 1999, while the EWM index for Wales was statistically significantly lower than the previous three periods.

Circulatory diseases

Circulatory diseases accounted for 21.1% and 20.0% of all EWD in England and Wales respectively, with 14.4% (5,600) and 16.1% (400) more deaths occurring in the winter months than the non-winter months. The EWM index was statistically significantly higher than the 2018 to 2019 winter, but statistically significantly lower than the 2017 to 2018 winter in both countries.

6 . Weekly deaths and influenza activity

Influenza is a respiratory disease caused by a viral infection that affects the lungs and airways (World Health Organization, 2008). Influenza infections can become potentially life-threatening when complications such as bacterial pneumonia occur. Those at most risk of developing complications are persons with other underlying health conditions and the elderly and such complications may result in hospitalization or death.

The data in this section excludes deaths where the coronavirus (COVID-19) was mentioned on the death certificate; however, we have published analysis comparing deaths due to COVID-19 with deaths from influenza and pneumonia.

England

Figure 6a plots the weekly number of deaths and weekly influenza-like illness (ILI) consultation rates in primary care in England from Week 31 of 2004 to Week 30 of 2020 (where Week 1 is the first week of the year).

In the 2019 to 2020 winter period, the ILI consultation rate peaked in Week 51 of 2019 (week ending 22 December) with 24.4 consultations per 100,000 population, occurring earlier than the 2018 to 2019 winter period, which peaked in Week 6 of 2019 (week ending 10 February) at a slightly higher rate with 25.4 consultations per 100,000 population. The peak number of deaths in the 2019 to 2020 winter period occurred in Week 1 of 2020 (week ending 5 January) with 11,502 deaths. This was earlier than the 2018 to 2019 winter period where the peak occurred in Week 6 of 2019 with 11,066 deaths.

Figure 6a: The highest number of weekly winter deaths in England occurred in Week 1 of 2020

Weekly deaths and influenza-like illness (ILI) consultation rates per 100,000 population, England, occurring between Week 31 of 2004 and Week 30 of 2020

Download the data

Notes:

1. Figures are based on deaths occurring each week. Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.

2. Influenza-like illness (ILI) consultation rates for England are presented from 2004 onwards as data back to this time point are deemed most reliable because of changes in coding in primary care increasing consistency.

3. Figures for England exclude deaths of non-residents.

4. Weeks run from Monday to Sunday; this is different to the weeks used in Deaths registered weekly in England and Wales which run from Saturday to Friday.

5. Figures are based on deaths from all causes excluding those that had COVID-19 mentioned on the death certificate.

Wales

Figure 6b plots the weekly number of deaths and weekly influenza-like illness (ILI) consultation rates in primary care in Wales from Week 31 of 1999 to Week 30 of 2020.

In the 2019 to 2020 winter period, the ILI consultation rate peaked in Week 52 of 2019 (week ending 29 December) with 37.1 consultations per 100,000 population, which was earlier than the 2018 to 2019 winter period, which peaked in Week 3 of 2019 (week ending 20 January) with 25.1 consultations per 100,000 population. The highest number of weekly deaths in the 2019 to 2020 winter period occurred in Week 1 of 2020 (week ending 5 January) with 810 deaths, two weeks later than the peak of weekly deaths in the 2018 to 2019 winter period, which occurred in Week 51 of 2018 (week ending 23 December) with 732 deaths.

Figure 6b: The highest number of weekly winter deaths in Wales occurred in Week 1 of 2020

Weekly deaths and influenza-like illness (ILI) consultation rates per 100,000 population, Wales, occurring between Week 31 of 1999 and Week 30 of 2020

Download the data

Notes:

1. Figures are based on deaths occurring each week. Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.

2. The surveillance system used to calculate influenza-like illness (ILI) consultation rates in Wales changed between 2009 to 2010 and 2010 to 2011 so caution is advised when comparing rates before and after these periods.

3. Figures for Wales exclude deaths of non-residents.

4. Weeks run from Monday to Sunday; this is different to the weeks used in Deaths registered weekly in England and Wales which run from Saturday to Friday.

5. Figures are based on deaths from all causes excluding those that had COVID-19 mentioned on the death certificate.

Impact of influenza

According to Public Health England's UK Surveillance report (PDF, 2.22MB), the 2019 to 2020 winter saw low levels of influenza activity in the community, with circulation of influenza A(H3N2) dominating the season; while in general practice, low levels of influenza activity were seen in England and medium levels in Wales. This is similar to last winter (2018 to 2019), where moderate to low levels of influenza were observed.

The influenza vaccination uptake was slightly higher in the winter of 2019 to 2020 compared with 2018 to 2019 for those aged 65 years and over, in England and Wales (72.4% and 69.4% respectively) and frontline heath care workers (74.3% and 58.7% respectively). In terms of vaccine effectiveness in the UK, vaccinations were most effective in those aged 18 to 64 years with 48.6% effectiveness and those aged 2 to 17 years with 45.4% effectiveness. In contrast, vaccine effectiveness for those aged 65 years and over decreased from 49.9% in 2018 to 2019 to 22.7% effectiveness in 2019 to 2020. This decrease in effectiveness in older ages may have contributed to the increase in excess winter deaths.

7 . Mortality and temperature

Research has shown that as the temperature gets colder mortality increases, but temperature is only able to explain a part of the variance in excess winter mortality (EWM)(PDF, 293KB).

As detailed in Section 2, the data in this section exclude deaths where the coronavirus (COVID-19) was mentioned on the death certificate.

During the winter period (December to March) in England, January and February had a lower count of mean daily deaths when compared with the five-year average, while December and March had a higher count of mean daily deaths compared with the average (Figure 7a). Wales saw a similar pattern, with a lower count of mean daily deaths in January and February, but a slightly higher count of mean daily deaths in December (3 additional deaths) while March remained the same as the average (Figure 7b).

The highest mean daily winter deaths in England (1,561 deaths) was in December and the highest mean daily winter deaths in Wales (106 deaths) was in January. In England, a majority of non-winter months had higher mean daily deaths than the five-year average, particularly in April, while in Wales, four out of the eight non-winter months had slightly higher mean daily deaths than the five-year average.

Above average temperatures were observed in 7 out of 12 months in England and Wales, particularly during the winter months where January and February were higher than the five-year average in England and January to March were higher than the average in Wales. The most recent EWM figures suggest that increased EWM is not always coupled with colder winter temperatures and conversely winters with decreased EWM is not always coupled with milder winters, indicating that factors other than temperature, such as influenza, are also relevant in explaining trends in EWM.

Figure 7a: During the winter months, December had the highest mean daily deaths in England

Mean number of daily deaths each month and mean monthly temperatures, England, occurring between August 2019 and July 2020

Download the data

Notes:

1. Mean daily deaths data are based on deaths occurring in each month. Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.

2. Five-year averages for each month are calculated using data from the previous five years excluding the current year.

3. Figures for England exclude deaths of non-residents.

4. Figures are based on deaths from all causes excluding those that had COVID-19 mentioned on the death certificate.

Figure 7b: During the winter months, January had the highest mean daily deaths in Wales

Mean number of daily deaths each month and mean monthly temperatures, Wales, occurring between August 2019 and July 2020

Download the data

Notes:

1. Mean daily deaths data are based on deaths occurring in each month. Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.

2. Five-year averages for each month are calculated using data from the previous five years excluding the current year.

3. Figures for Wales exclude deaths of non-residents.

4. Figures are based on deaths from all causes excluding those that had COVID-19 mentioned on the death certificate.

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

As detailed in Section 2, the data in this section exclude deaths where the coronavirus (COVID-19) was mentioned on the death certificate.

In 2019 to 2020, the highest excess winter mortality (EWM) index was in Wales with 19.2%, followed by the North West with 19.0% and London with 18.6%. The EWM index for these areas was statistically significantly higher than the England average (16.8%). In comparison, Yorkshire and The Humber (15.7%), the East of England (15.6%), the South West (15.2%) and the North East (13.8%) were statistically significantly lower.

Overall, the regional EWM index fluctuates year-on-year with no consistent patterns over time. For example, Wales had the highest EWM index in 2019 to 2020 but the second-lowest in 2018 to 2019. The EWM index in 2019 to 2020 for four English regions and Wales was statistically significantly higher than the 2018 to 2019 winter period, while the EWM index for the North East, and Yorkshire and The Humber was statistically significantly lower.

Figure 8: Wales had the highest excess winter mortality index in 2019 to 2020

Excess winter mortality index for regions of England and in Wales, occurring between 2019 and 2020

Download the data

Notes:

1. Figures are based on deaths occurring in each period (August through to the following July). Numbers of deaths from January to July 2020 are provisional and have been adjusted to take account of late registrations.
2. The excess winter mortality (EWM) index is calculated as excess winter deaths (EWD) divided by the average non-winter deaths, expressed as a percentage.
3. Figures for England, English regions and Wales exclude deaths of non-residents.
4. Figures are based on boundaries as of August 2020.
5. Figures are based on deaths from all causes excluding those that had COVID-19 mentioned on the death certificate.

9 . Excess winter mortality data

Excess winter mortality in England and Wales: 2019 to 2020 (provisional) and 2018 to 2019 (final)
Dataset | Released 27 November 2020
Annual figures of excess winter mortality in England and Wales by sex, age group, cause, region and lower geographical areas.

10 . Glossary

Excess winter deaths (EWD)

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

Excess winter mortality (EWM) index

The EWM index is calculated so that comparisons can be made between sexes, age groups and geographical areas and 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.

11 . Measuring the data

In common with other countries, more people die in the winter than in the summer in England and Wales. This statistical bulletin presents provisional figures for excess winter deaths (EWD) and the excess winter mortality (EWM) index in England and Wales for the winter period 2019 to 2020 and final figures for the winter period 2018 to 2019. Historical trends from the winter of 1950 to 1951 onwards are also provided for comparison. Figures are presented by sex, age, cause of death and region. Information on temperature and influenza incidence is also given to add context to the mortality figures.

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.

More quality and methodology information on strengths, limitations, appropriate uses, and how the data were created is available in the Excess winter mortality Quality and Methodology Information (QMI) report. The User guide to mortality statistics provides further information on the collection, production and quality of the underlying mortality data.

Method for calculating excess winter deaths (EWD)

Johnson and Griffiths (2003) investigated seasonal mortality and reported that historically, above average mortality is typically seen between December and March in England and Wales (PDF, 98KB). Therefore, 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:

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

This produces the number of EWD. Provisional EWD figures are produced for the most recent winter using special estimation methods (see the Quality and Methodology Information report), and so are rounded to the nearest 100 deaths. Final EWD figures for the previous winter are rounded to the nearest 10 deaths.

Method for calculating excess winter mortality (EWM) index

The EWM index is calculated so that comparisons can be made between sexes, age groups and regions and is calculated as the number of EWD divided by the average non-winter deaths:

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

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

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

The EWM index shows the percentage of extra deaths that occurred in the winter and is reported to 1 decimal place.

Because of the coronavirus (COVID-19) pandemic, there are instances where we have calculated EWD and EWM index including and excluding COVID-19. We will be reviewing our method for calculating EWM for next year's bulletin (2020 to 2021 (provisional) and 2019 to 2020 (final)).

Early access for quality assurance purposes

We provide early access for quality assurance purposes to a small number of analysts within Public Health England (PHE), Public Health Wales (PHW) and 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 influenza and weather. However, the ONS itself independently produces these statistics, including determining the focus, content, commentary, illustration and interpretation of these measures presented in bulletins.

12 . Strengths and limitations

The strengths of the excess winter mortality bulletin include the following:

- provisional data are used to enable timely analysis to be completed to monitor excess winter mortality trends
- 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 excess winter mortality 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
- because of rounding of excess winter deaths, there can be differences between totals and their breakdowns

13 . Related links

Analysis of death registrations not involving coronavirus (COVID-19), England and Wales
Article | Released 2 September 2020
Exploration of trends in non-COVID-19 deaths since 2 May 2020, how they compare with the five-year average, and how the nature of deaths from 2 May to 10 July may have changed from previous years when total numbers of non-COVID-19 deaths have returned to more expected levels.

Deaths registered in England and Wales: 2019
Bulletin | Released 1 July 2020
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 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: October 2020
Bulletin | Released 19 November 2020
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 2019 to 2020
Bulletin | Released 13 October 2020
Figures for the seasonal increase in mortality in Scotland for winter 2019 to 2020 and earlier years.