

# Winter Mortality in Scotland 2020/21



Published on 12 October 2021

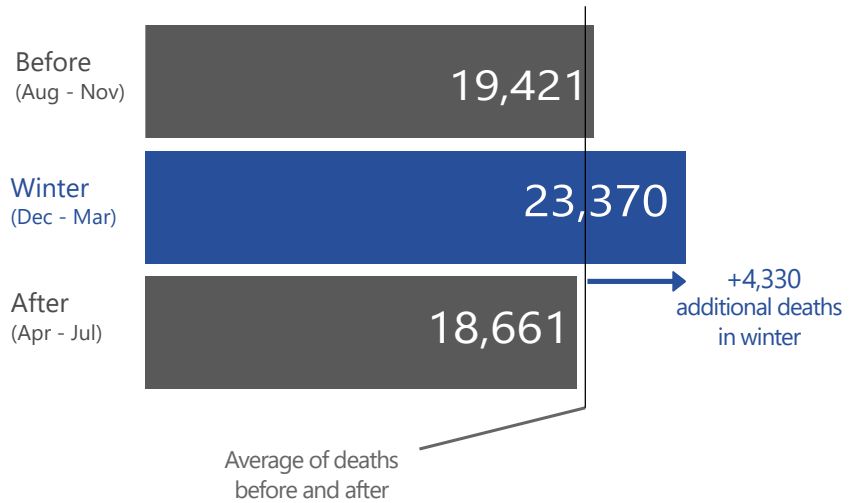
Statistics on the seasonal increase in mortality in winter in Scotland, broken down by age-group, sex, cause of death, Scottish Index of Multiple Deprivation quintile, NHS Board and Local Authority area.

## High seasonal increase in winter 2020/21

Winter months see more deaths than other times of the year. We measure the size of this effect by looking at the difference between deaths registered over winter and the average number of deaths in the adjacent periods (before and after).

The 23,370 winter deaths in 2020/21 is the second highest number of winter deaths in the last 30 years.

Deaths before, during and after winter 2020/21



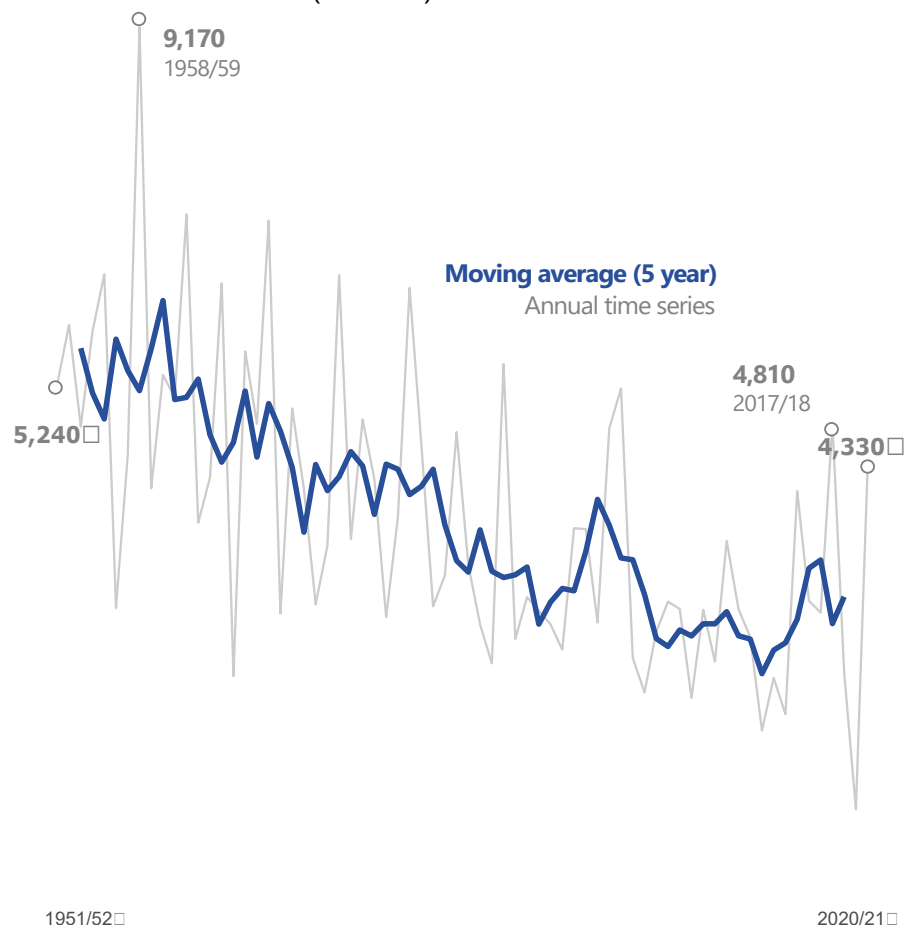
## Second highest seasonal increase in more than 20 years

The seasonal increase in mortality of 4,330 for winter 2020/21 was the second highest in more than 20 years. Only winter 2017/18 had a larger seasonal increase (4,810)

Over the long term there has been a clear downward trend in winter mortality. In the 1950s and 1960s there was an average seasonal increase of over 5,200 deaths, whereas over the most recent decade it has averaged around 2,600.

Figures for the most recent years suggest a departure from the long-term downward trend. It is not clear whether this will continue as there have been similar increasing periods in the past which were followed by a return to the longer term decreasing trend.

Additional deaths in winter (Dec-Mar)



## Contents

Main Points.....	4
1. Introduction.....	5
2. Winter mortality in Scotland.....	5
3. The seasonal increase in mortality in the winter by age-group.....	7
4. The seasonal increase in mortality in the winter by sex.....	8
5. The seasonal increase in mortality in the winter by deprivation.....	9
6. The seasonal increase in mortality in the winter across areas in Scotland.....	10
7. The seasonal increase in mortality in the winter by cause of death.....	13
8. Comparisons with the rest of UK and other countries.....	14
9. Links to related statistics.....	15
10. Notes on statistical publications.....	15

### Further information is available here:

#### Additional analyses on winter mortality including:

- relationship with mean winter temperature
- relationship with weekly rate for GP consultations
- impact of COVID -19 on winter 2019/20

Annexes – providing further methodological information.

#### Tables and Figures

For additional information on, for example, some of the medical causes of increased mortality in winter and the factors that influence it, as well as comparisons with some European countries' figures, see the following background note

## Main Points

- There were 23,370 deaths registered in Scotland in the four months of winter 2020/21 (December 2020 to March 2021) – the second highest total in the last 30 years.
- The seasonal increase in mortality of 4,330 for winter 2020/21 was the second highest in more than 20 years. Only winter 2017/18 has had a larger seasonal increase (4,810) since winter 1999/2000.
- The seasonal increase in mortality can change substantially from winter to winter, but the long-term trend has clearly been downward. In the 1950s and 60s, there was an average seasonal increase of over 5,200 deaths in winter, whereas over the most recent decade it has averaged around 2,600. Figures for the most recent years suggest a departure from the long-term downward trend. It is not clear whether this will continue as there have been similar increasing periods in the past which were followed by a return to the longer term decreasing trend.
- Coronavirus (COVID-19) was the underlying cause of nearly two-thirds (2,850) of the 4,330 'additional' deaths in winter 2020/21.
- The other causes of death with the largest seasonal increases in winter 2020/21 were dementia and Alzheimer's disease (210 'additional' deaths) and coronary (ischaemic) heart disease (also 210). Very few deaths are directly due to cold weather (e.g. hypothermia).
- Older age groups are consistently affected most by the seasonal increase in mortality in winter. In winter 2020/21, for people aged 85 and over there were 13 'additional' deaths per 1,000 population, compared to fewer than 1 per 1,000 for those aged under 65. There have been similar substantial differences between these age groups over the last 30 years.
- The seasonal increase in mortality in winter is generally lower in Scotland than in England, Wales and Northern Ireland.

## 1. Introduction

This publication provides statistics on mortality in Scotland during winter 2020/21. This includes trends since 1951, as well as breakdowns by age, sex, cause of death, areas of Scotland and other factors.

Winter months generally see more deaths than other times of the year. The size of this effect is measured by looking at the difference between deaths registered over winter (December to March) and the average number of deaths in the adjacent periods (before and after) – the seasonal increase in mortality in winter. This definition is also used by other organisations like the Office for National Statistics (ONS) and the World Health Organisation (WHO) to measure winter mortality. For more information on this definition, see the box below.

The seasonal increase in mortality is calculated using data from death registration records. The latest year's figures are provisional until the 2021 mortality data are finalised in summer 2022, but any revisions are usually very small.

## 2. Winter mortality in Scotland

There were 23,370 deaths registered in Scotland in the four months of winter 2020/21 (December 2020 to March 2021) – the second highest total since winter 1989/90 (25,497 deaths), and the largest number since winter 1999/2000 (23,379 deaths).

It is generally expected that more deaths will be registered in Scotland in the four 'winter' months (December to March), than in either the four months before (August to November) or the four months after (April to July). There has been only one exception in 70 years: because of the coronavirus (COVID-19) pandemic, more deaths were registered from April 2020 to July 2020 than were registered in winter 2019/20 (December 2019 to March 2020).

### What is 'Winter Mortality'?

The seasonal increase in mortality in the winter is defined as the difference between the number of deaths in the 4-month 'winter' period (December to March, inclusive) and the average number of deaths in the two 4-month periods which precede winter (August to November, inclusive) and follow winter (April to July, inclusive).

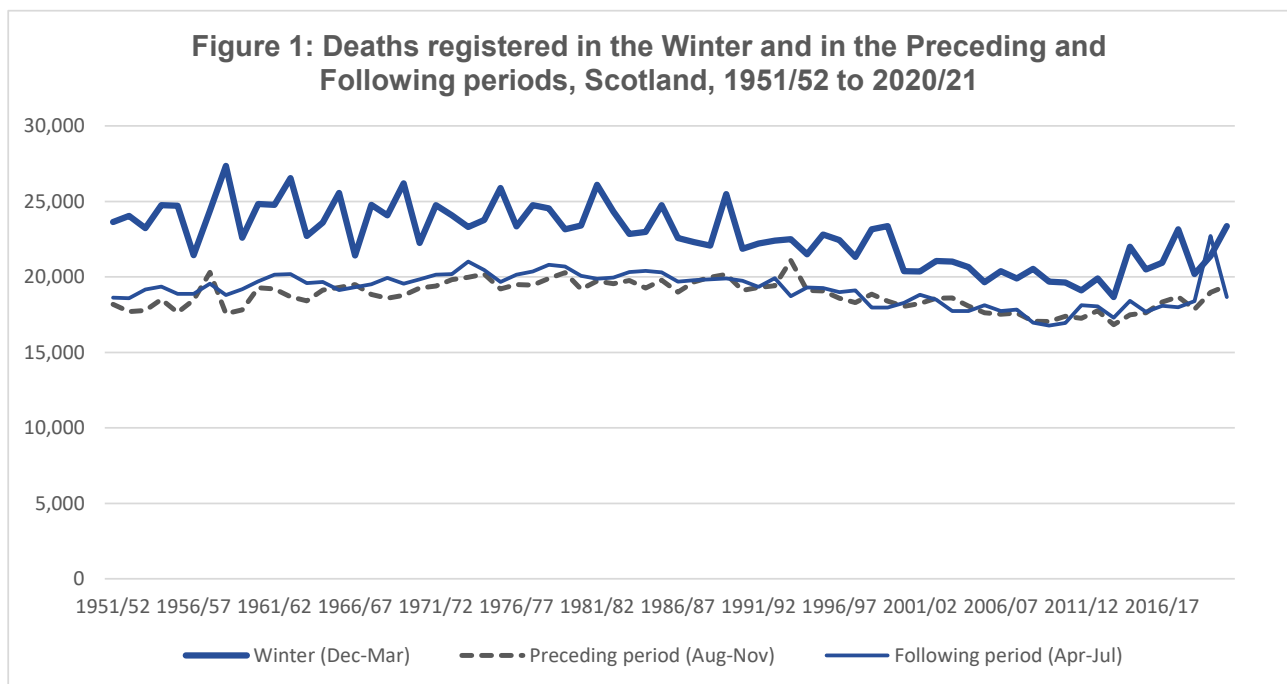
The seasonal increase represents the number of 'additional' deaths in winter. It is also referred to as 'excess winter deaths' or 'excess winter mortality'.

To account for differences in population size, seasonal increases for different areas of Scotland are better compared using the Increased Winter Mortality Index (IWMI). This is defined as the number of 'additional' winter deaths divided by the average number of deaths in a four month 'non-winter' period, expressed as a percentage. For the IWMI data for NHS board and Local Authority areas, please see Tables HB2 and LA2, which are available here.

The seasonal increase in mortality (number of deaths registered in winter compared with the average for the two adjacent 4-month periods) of 4,330 for winter 2020/21 was the second highest in more than 20 years. Only winter 2017/18 has had a larger seasonal increase (4,810) since winter 1999/2000 (5,190).

The seasonal increase of 4,330 in winter 2020/21 was much higher than the corresponding figure of 550 for the previous winter (2019/20). This was due to two consequences of the COVID-19 pandemic:

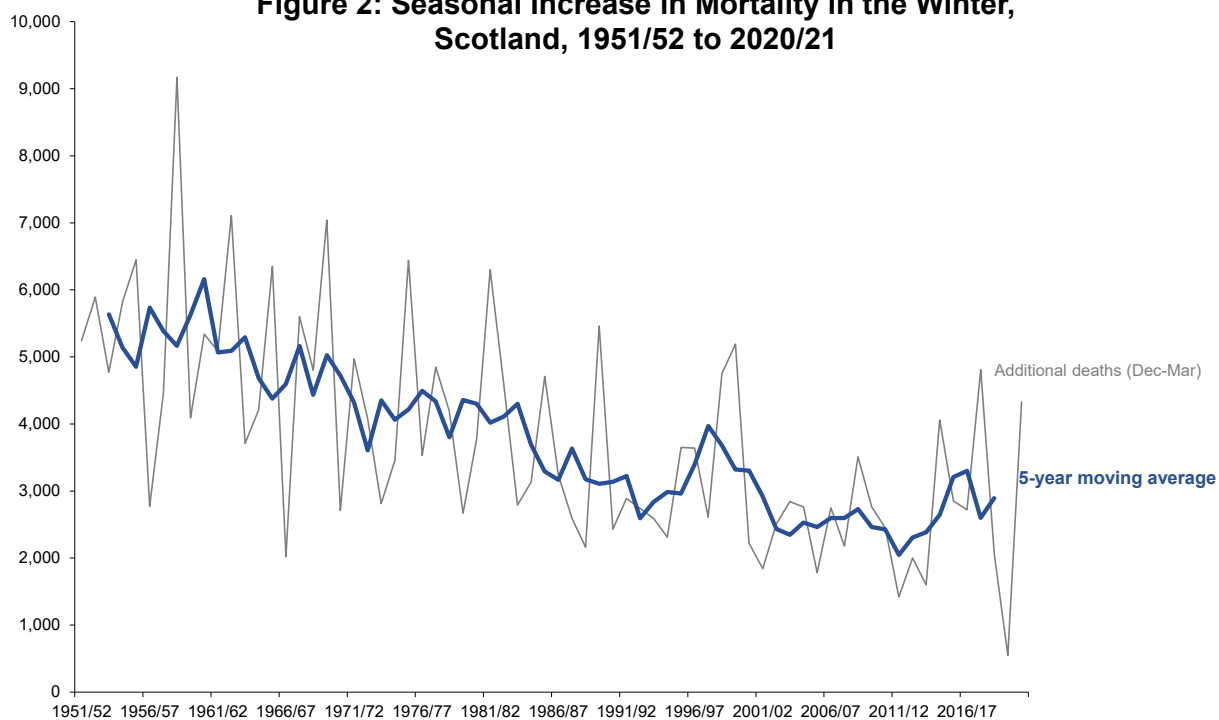
1. there was a higher number of deaths from April to July in 2020 than in winter 2019/20, leading to winter 2019/20 having an unusually small seasonal increase.
2. there was a high number of deaths in winter 2020/21, resulting in an unusually large seasonal increase. COVID-19 was the cause of about two-thirds of the 'additional' deaths in winter 2020/21.



The number of 'additional' winter deaths can change substantially from winter to winter, but over the past 70 years the long-term trend has clearly been downward. In the 1950s and 60s, there was an average seasonal increase in winter of over 5,200 deaths, whereas over the most recent ten winters it has averaged around 2,600.

Using a 5-year moving average is a better indication of the overall trend, as it 'smooths out' most of the effect of year-to-year fluctuations. This moving average has tended to decline since the 1950s, albeit with occasional short-term rises (e.g. mid-1990s), and reached its lowest value (2,046) in the early 2010s. Figures for the most recent years suggest a departure from the long-term downward trend. It is not clear whether this will continue as there have been similar increasing periods in the past which were followed by a return to the long term decreasing trend.

**Figure 2: Seasonal Increase in Mortality in the Winter, Scotland, 1951/52 to 2020/21**



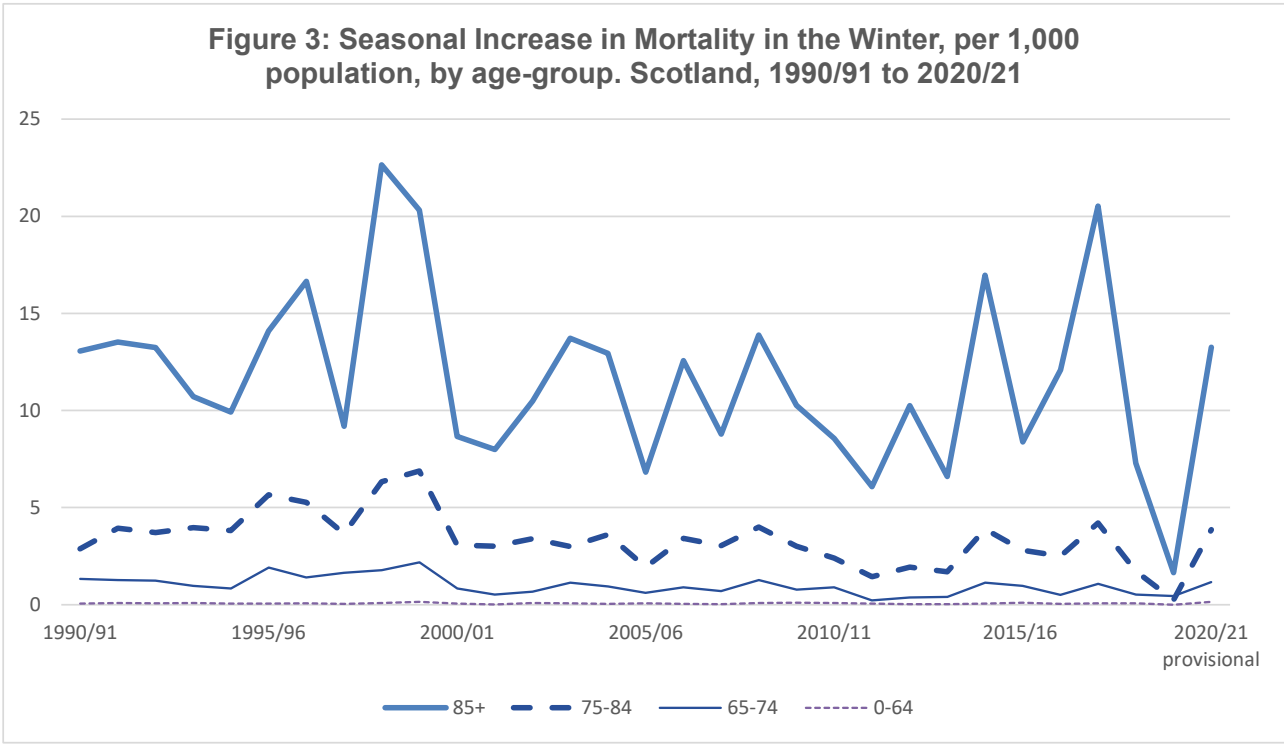
### 3. The seasonal increase in mortality in the winter by age-group

Older age groups are affected most by the seasonal increase in mortality in winter.

In winter 2020/21, for people aged 85 and over there were 13 'additional' deaths per 1,000 population, compared to only 0.15 per 1,000 for those aged under 65.

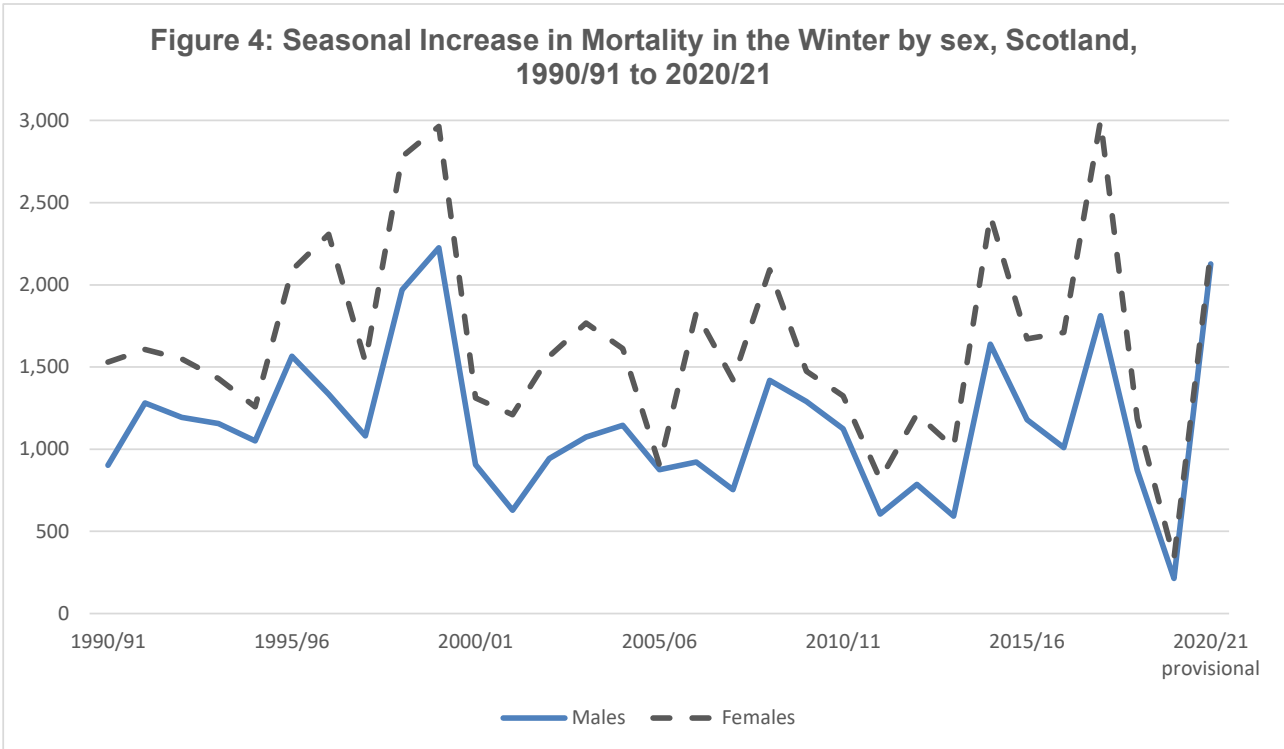
Over the last 30 years, the number of 'additional' deaths per 1,000 population has usually been:

- 10 or more per 1,000 for those aged 85 and over
- between 2 and 5 per 1,000 for those aged 75 to 84
- around 1 per 1,000 for those aged 65 to 74
- below 1 in 10,000 for aged less than 65.



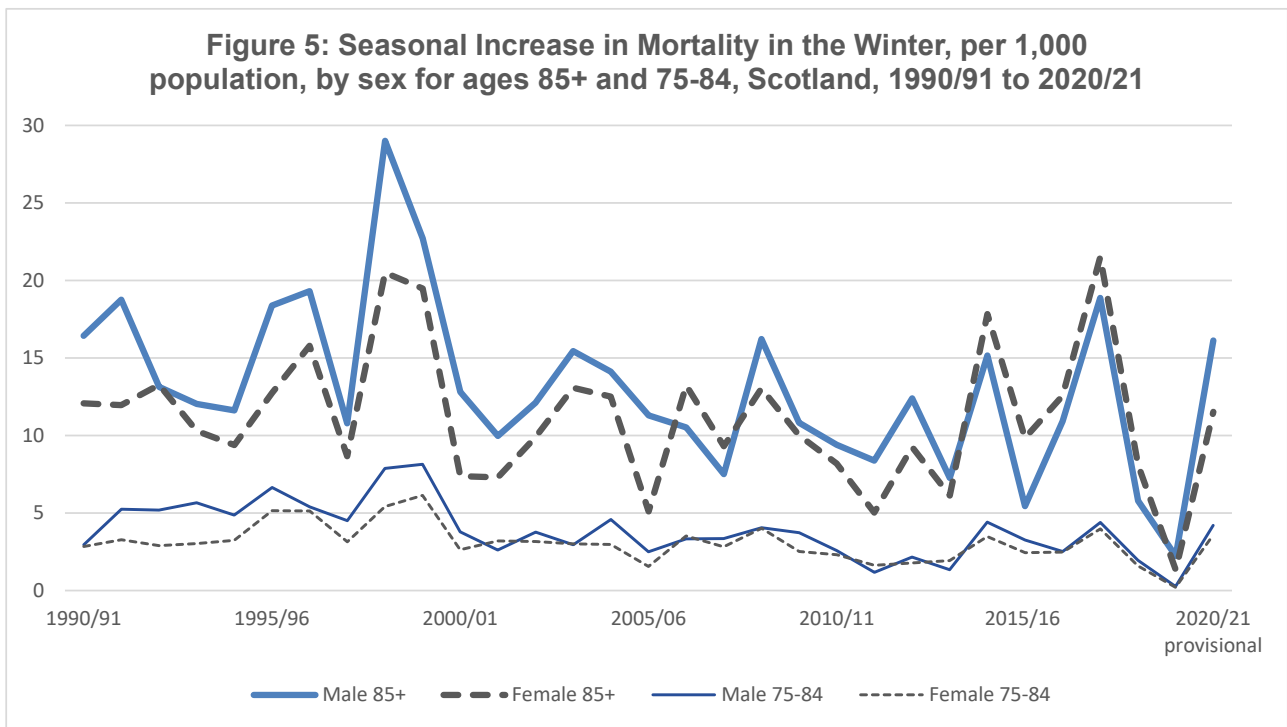
**4. The seasonal increase in mortality in the winter by sex**

Over the past 30 years, the number of ‘additional’ deaths in winter has been greater for females than for males. This is largely explained by the fact that females live longer than males, and therefore account for a larger proportion of the population in older age groups.



In winter 2020/21, males had the higher ‘additional’ death rates per 1,000 population, for both 75-84 and 85+ year olds. That has been the case for most of the past 30 years.



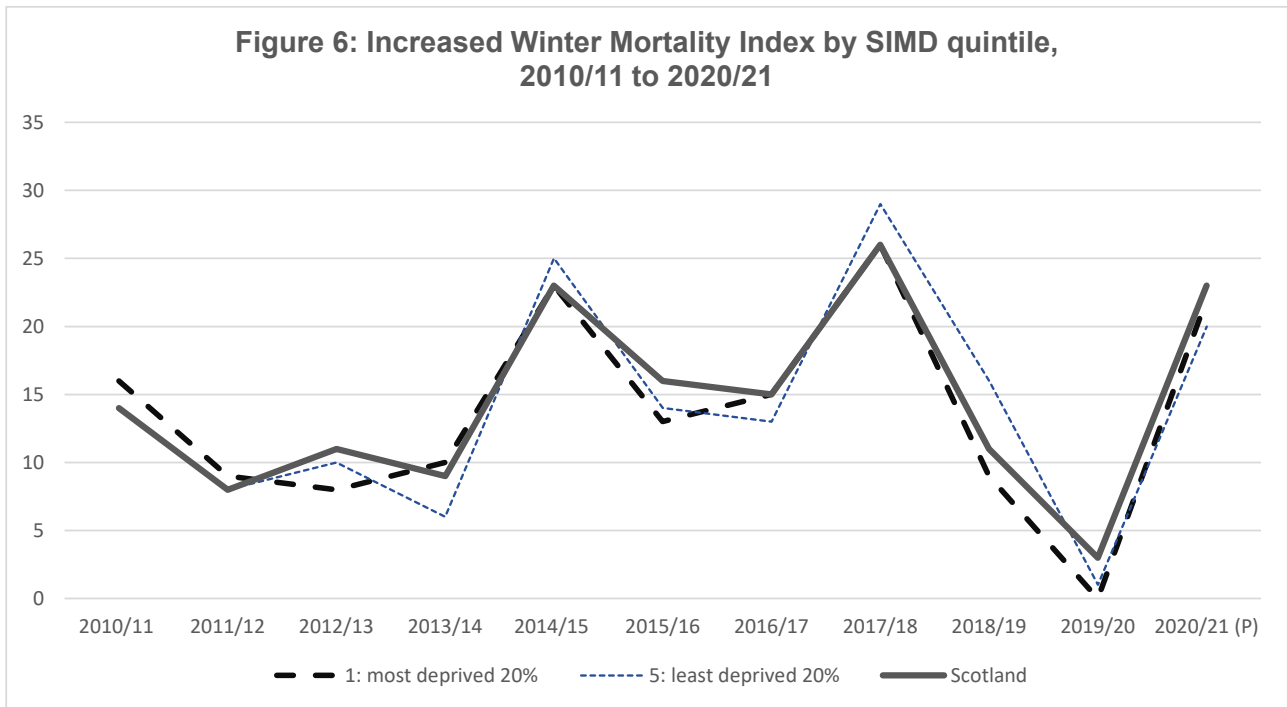


### 5. The seasonal increase in mortality in the winter by deprivation

There is no clear evidence of any consistent difference in the seasonal increase in mortality in winter between the most deprived and least deprived parts of Scotland.

The seasonal increase for each of the 5 deprivation quintiles tends to rise and fall with the overall Scottish figure and, over the last decade, has generally been within three percentage points of this value. Sometimes, the most deprived quintile has experienced the highest seasonal increase in mortality; at other times, the least deprived quintile.

**Deprivation quintiles** are based on the [Scottish Index of Multiple Deprivation \(SIMD\)](#). This is an area based measure of deprivation. Quintiles are allocated according to the deceased's usual place of residence.



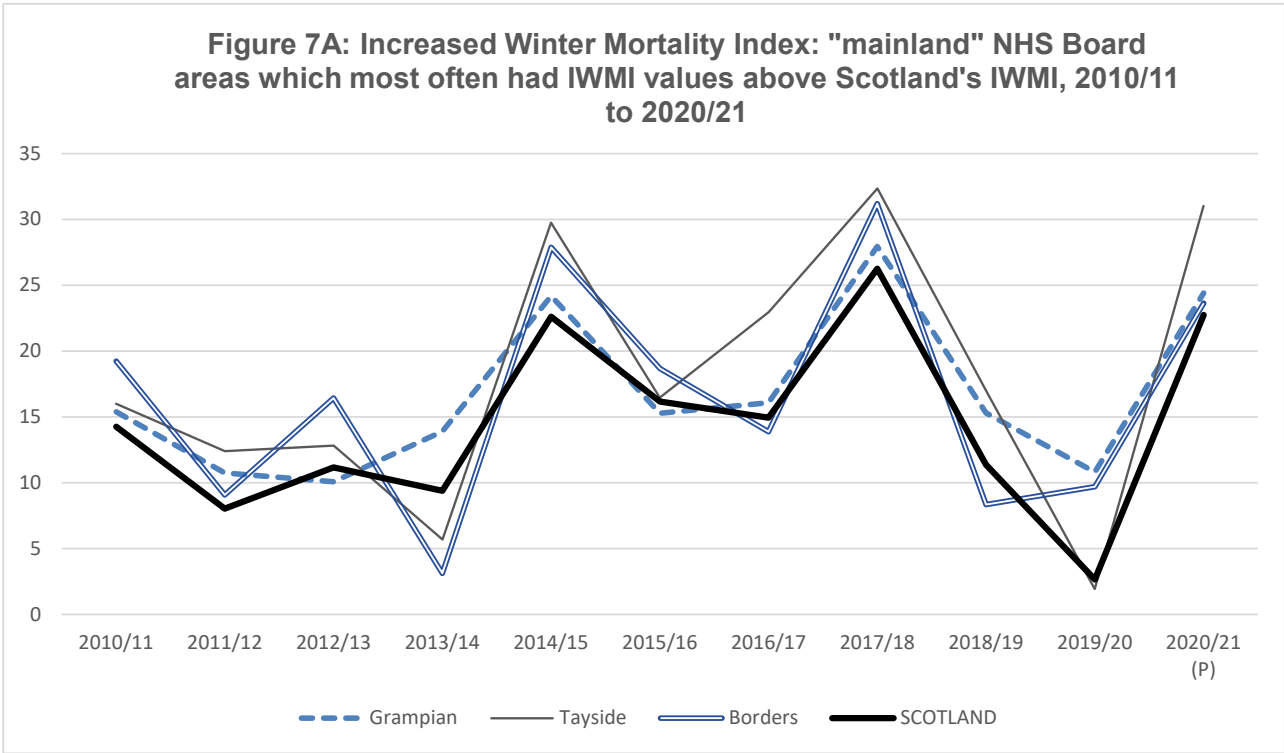
## 6. The seasonal increase in mortality in the winter across areas in Scotland

There is no clear evidence of any consistent difference in the seasonal increase in mortality in winter across areas of Scotland.

However, over the last eleven winters (2010/11 to 2020/21), the following NHS Board areas have tended to have the highest seasonal increases in mortality in winter when compared with the Scottish average:

- Grampian (above the Scottish average in 9 of the 11 winters)
- Tayside (also 9 of 11 winters)
- Borders (8 of 11 winters).

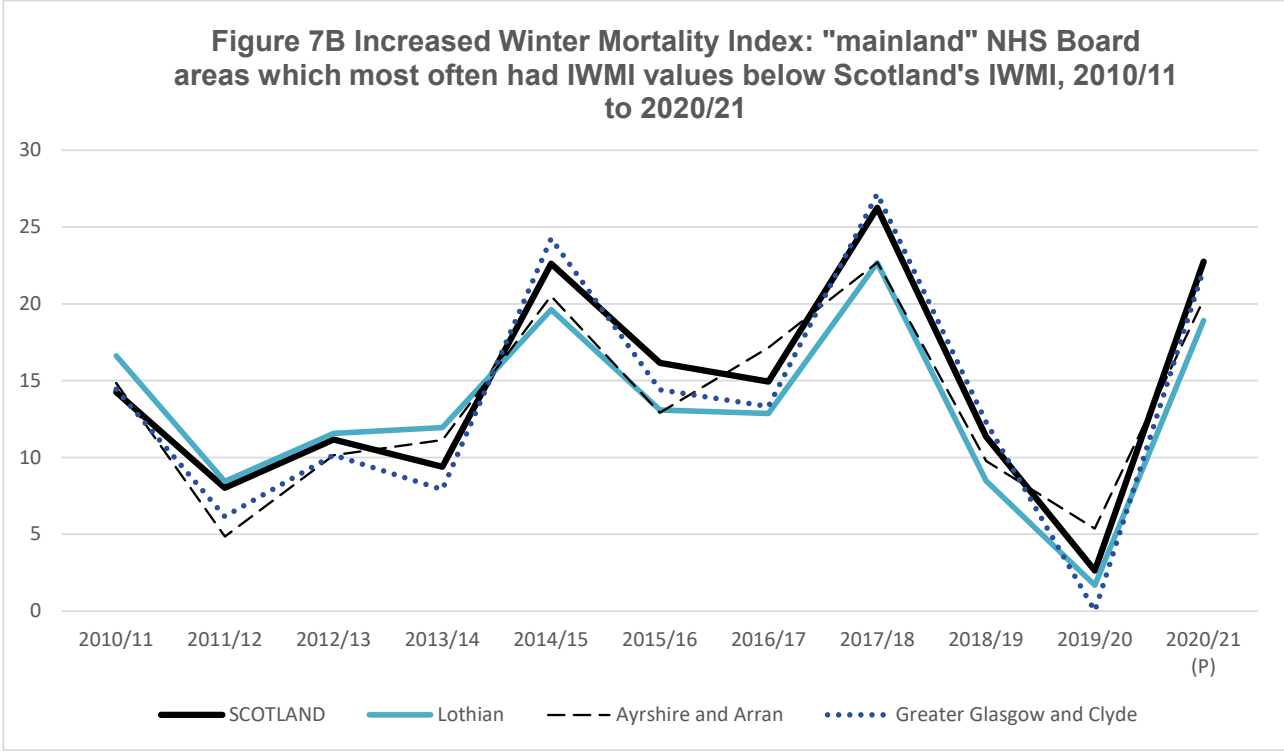
All three were higher than the Scottish average in the latest winter 2020/21. However, it is worth noting there are some large year-to-year fluctuations in these areas' figures.



Over the last eleven winters, the following NHS Board areas have tended to have the lowest seasonal increases in mortality in winter when compared with the Scottish average:

- Ayrshire and Arran (below the Scottish average in 7 of the 11 winters)
- Greater Glasgow and Clyde (also 7 of 11 winters)
- Lothian (also 7 of 11 winters).

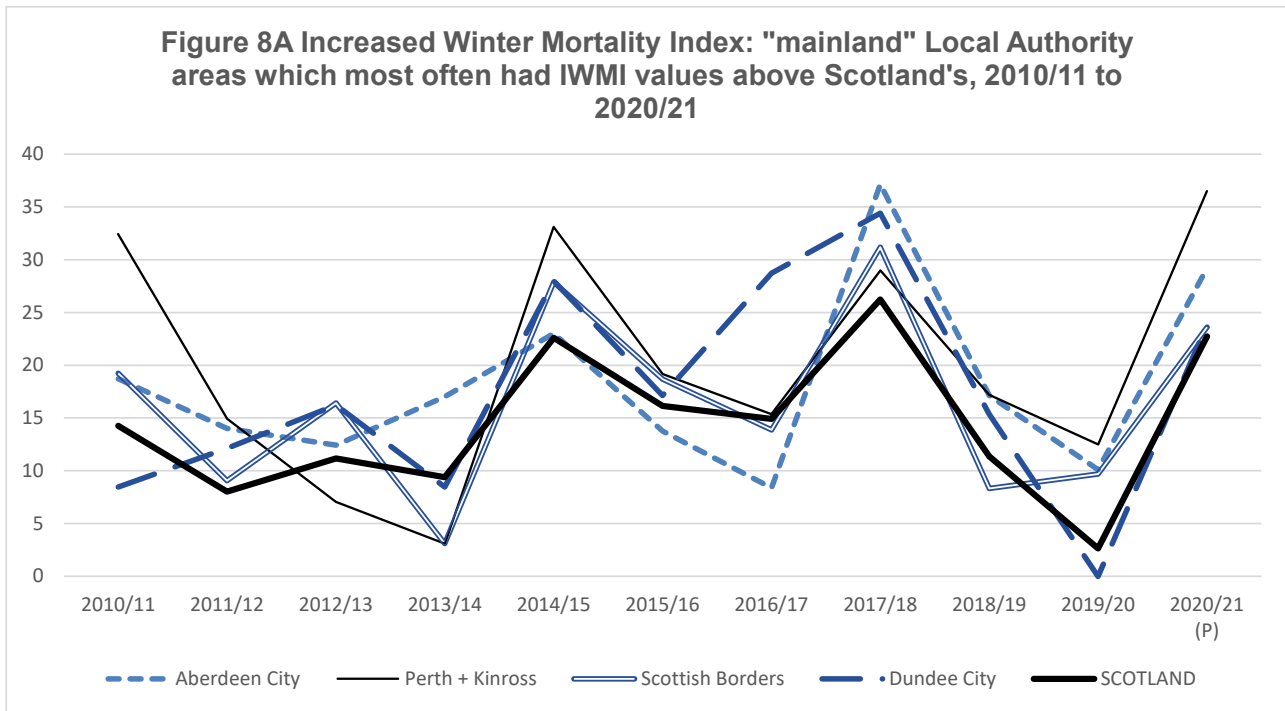
All three were below the Scottish average in the latest winter 2020/21.



Over the last eleven winters, the following local authority areas have tended to have the highest seasonal increases in mortality in winter when compared with the Scottish average:

- Aberdeen City (above the Scottish average in 9 of the 11 winters)
- Perth and Kinross (also 9 of 11 winters)
- Dundee City (8 of 11 winters)
- Scottish Borders (8 of 11 winters).

All four were above the Scottish average in the latest winter 2020/21.

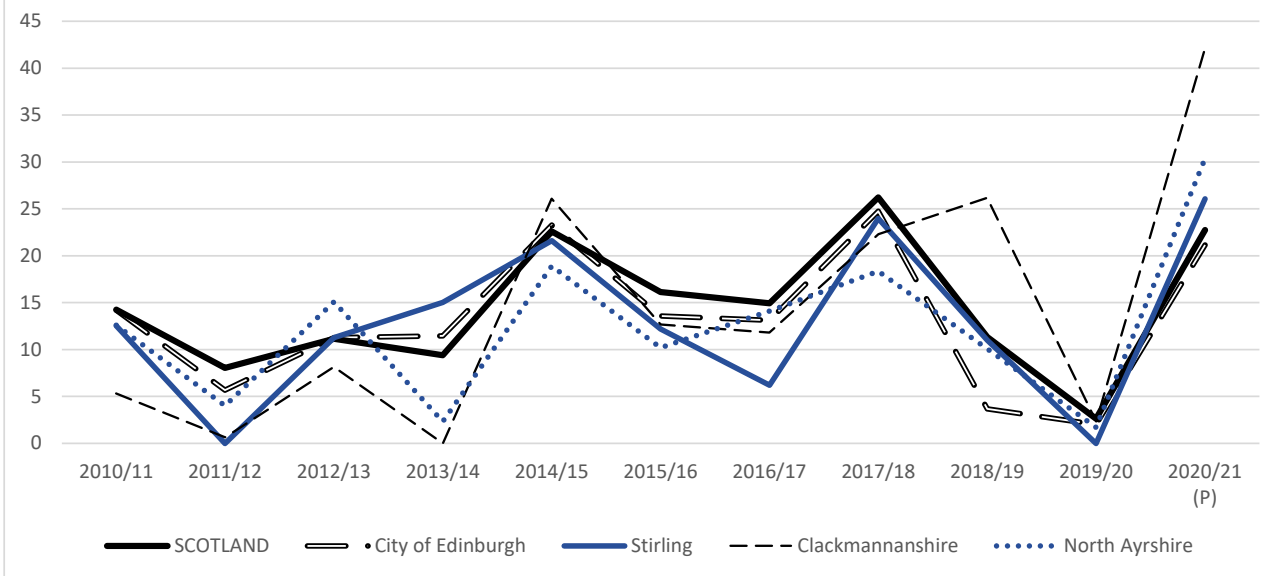


Over the last eleven winters, the following local authority areas have tended to have the lowest seasonal increases in mortality in winter when compared with the Scottish average:

- North Ayrshire (below the Scottish average in 9 of the 11 winters)
- City of Edinburgh (8 of 11 winters)
- Clackmannanshire (also 8 of 11 winters)
- Stirling (also 8 of 11 winters).

Only one of them was below the Scottish average in the latest winter 2020/21.

**Figure 8B: Increased Winter Mortality Index: "mainland" Local Authority areas which most often had IWMI values below Scotland's, 2010/11 to 2020/21**

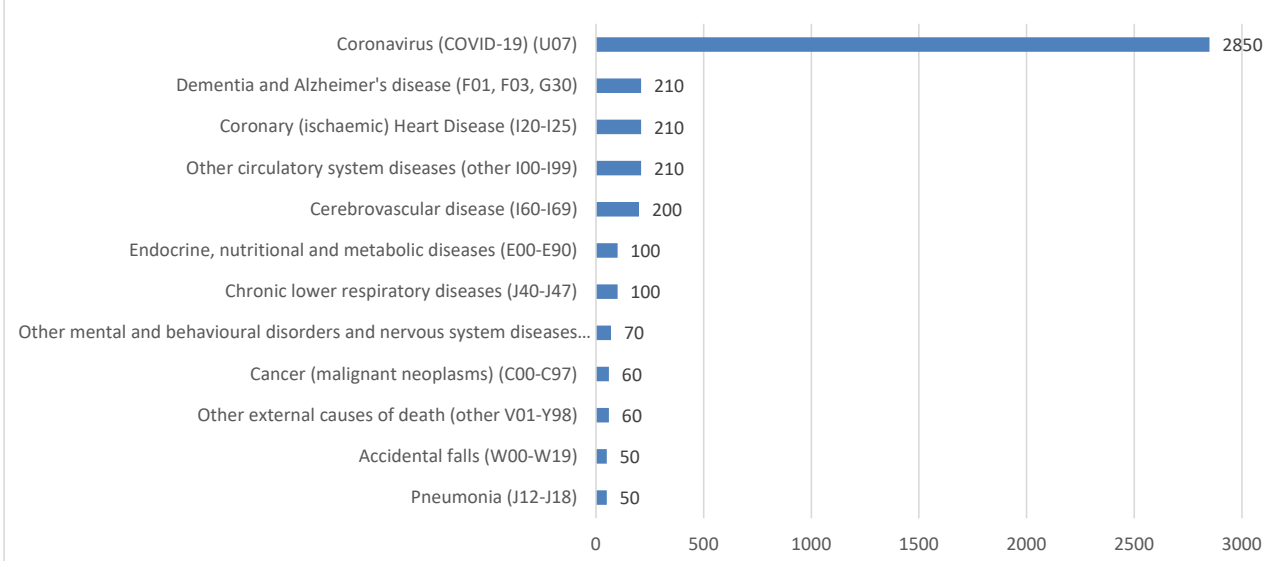


## 7. The seasonal increase in mortality in the winter by cause of death

COVID-19 was the underlying cause of nearly two thirds (2,850) of the 4,330 'additional' deaths in winter 2020/21.

Although COVID-19 had the largest impact on the increased winter mortality in 2020/21, most other causes of death had an increase in deaths over the winter period. The causes with the next largest seasonal increases in winter 2020/21 were dementia and Alzheimer's disease (210 'additional' deaths), coronary (ischaemic) heart disease (also 210), cerebrovascular disease (200) and other circulatory system diseases (210). Very few deaths are directly due to cold weather (e.g. hypothermia) or influenza.

**Figure 9: Seasonal Increase in Mortality in Winter 2020/21: main underlying causes**



Prior to the COVID-19 pandemic, most of the 'additional' deaths in winter were caused by:

- circulatory system diseases (e.g. coronary heart disease and stroke)
- respiratory system diseases (e.g. pneumonia and chronic obstructive pulmonary disease)
- dementia and Alzheimer's disease.

Over the winters from 2010/11 to 2018/19, those diseases combined accounted for an average of almost 80% of the total seasonal increase in mortality, compared to only 23% in winter 2020/21.

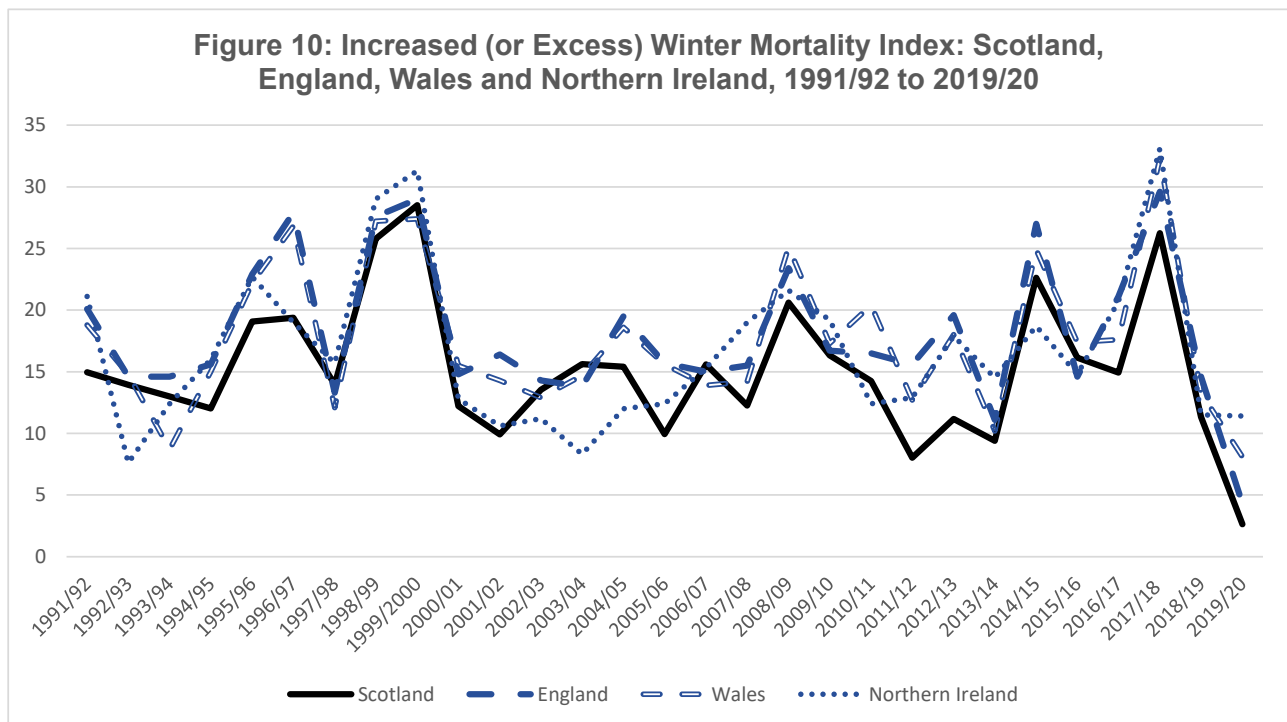
**The underlying cause of death** is defined as the disease or injury which initiated the chain of morbid events leading directly to death, or the accident/act which produced the fatal injury. Statistics are normally produced on this basis because every death has just one underlying cause, and so will be counted only once.

It is clear that the impact of the COVID-19 pandemic has affected the seasonal increase figures for the latest two winters (2019/20 and 2020/21) and they do not follow the usual pattern.

In winter 2019/20 there was only a very small seasonal increase as there were many more deaths from April to July 2020 (largely attributed to COVID-19) than from December 2019 to March 2020. Then in winter 2020/21, there was a higher number of deaths compared to previous years, again mostly explained by deaths involving COVID-19.

## 8. Comparisons with the rest of UK and other countries

In Scotland, the seasonal increase in mortality in winter has generally been lower than in England, Wales and Northern Ireland over the last 30 years.



Although equivalent data for comparisons with other European countries are not readily available, [research](#) has shown that winter mortality in Scotland has tended to be slightly higher

than the overall average for countries across Europe (in terms of the seasonal increase in mortality).

For additional information on this research and an explanation on some of the causes of increased mortality in winter, see the [background note](#).

## 9. Links to related statistics

- [Excess Winter Mortality in England and Wales](#) is published annually by the Office for National Statistics
- [Excess Winter Mortality in Northern Ireland](#) is published annually by the Northern Ireland Statistics and Research Agency
- [Deaths involving coronavirus \(COVID-19\) in Scotland](#) are published by NRS and provide weekly, monthly and annual statistics on such deaths.
- [Vital Events Reference Tables](#) are published by NRS and contain annual statistics on deaths.
- [Births, Deaths and Other Vital Events, Quarterly Figures](#) are published by NRS and contain statistics on deaths for the most recent quarter (with a limited breakdown by cause of death).

## 10. Notes on statistical publications

### National Statistics

The United Kingdom Statistics Authority (UKSA) has designated these statistics as National Statistics, in line with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics (available on the [UKSA](#) website).

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.

All official statistics should comply with all aspects of the Code of Practice for Official Statistics. They are awarded National Statistics status following an assessment by the Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is National Records of Scotland's responsibility to maintain compliance with the standards expected of National Statistics. If we become concerned about whether these statistics are still meeting the appropriate standards, we will discuss any concerns with the Authority promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

### Information on background and source data

Further details on data source(s), timeframe of data and timeliness, continuity of data, accuracy, etc can be found in the About this Publication document that is published alongside this publication on the NRS website.

## National Records of Scotland

We, the National Records of Scotland, are a non-ministerial department of the devolved Scottish Administration. Our aim is to provide relevant and reliable information, analysis and advice that meets the needs of government, business and the people of Scotland. We do this as follows:

Preserving the past – We look after Scotland’s national archives so that they are available for current and future generations, and we make available important information for family history.

Recording the present – At our network of local offices, we register births, marriages, civil partnerships, deaths, divorces and adoptions in Scotland.

Informing the future – We are responsible for the Census of Population in Scotland which we use, with other sources of information, to produce statistics on the population and households. You can get other detailed statistics that we have produced from the [Statistics](#) section of our website. Scottish Census statistics are available on the [Scotland’s Census](#) website.

We also provide information about [future publications](#) on our website. If you would like us to tell you about future statistical publications, you can register your interest on the Scottish Government [ScotStat website](#).

You can also follow us on twitter [@NatRecordsScot](#)

### Enquiries and suggestions

Please get in touch if you need any further information, or have any suggestions for improvement.

For media enquiries, please contact [communications@nrscotland.gov.uk](mailto:communications@nrscotland.gov.uk)

For all other enquiries, please contact [statisticscustomerservices@nrscotland.gov.uk](mailto:statisticscustomerservices@nrscotland.gov.uk)

Lead Statistician: Frank Dixon

### © Crown Copyright

You may use or re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. Further information is available within the [Copyright & Disclaimer](#) section of the National Records of Scotland website.