



## England & Wales mortality monitor – COVID-19 update – week 4 of 2022

### Summary

There have been around 121,700 excess deaths from all causes in the UK from the start of the pandemic to 28 January 2022. We calculate excess deaths by comparing deaths to those expected if mortality rates were similar to those experienced in 2019. This estimate uses data from National Records Scotland (NRS) and the Northern Ireland Statistics and Research Agency (NISRA) as well as the Office for National Statistics (ONS).

In week 4 of 2022, there were 1% more deaths registered in England & Wales than would have been expected if Standardised Mortality Rates had been the same as in the corresponding week of 2019. The corresponding figure for week 3 of 2022 was 3% more deaths.

### Background

During the coronavirus pandemic we have been publishing frequent updates to the CMI Mortality Monitor. This update shows the position as at 28 January 2022 (week 4 of 2022), based on provisional deaths data published by the Office for National Statistics (ONS) on 8 February 2022.

Now that excess deaths are relatively low, we are publishing two types of pandemic mortality monitor:

- A weekly “summary” version. The next is planned for week 5 of 2022 on Tuesday 15 February 2022.
- A more detailed “full” version, like this one, every four or five weeks. The next is planned for week 8 of 2022, on 8 March 2022.

We also continue to publish our quarterly mortality monitor. The most recent, to the end of 2021, was published alongside the pandemic monitor for week 52 of 2021 and based on provisional weekly deaths data to 31 December 2021. The next quarterly monitor is planned to be published alongside the week 13 monitor, for data to 1 April 2022, on 12 April 2022.

All updates are publicly available from the [CMI pages of the Institute and Faculty of Actuaries website](#), together with software that we have made available to Authorised Users to carry out ad hoc analyses.

### Notes

Full details of the methods used for results based on the ONS data are included in [Working Paper 111](#). Our analysis is based on Standardised Mortality Rates (SMRs). These adjust the provisional weekly deaths data published by the ONS to control for changes in the size, age and gender distribution of the population over time. We note that mortality rates and mortality improvements vary by age, and the results shown are sensitive to the age distribution of the chosen standard population (the 2013 European Standard Population).

Our calculations rely on data for registered deaths, and we are conscious that in recent months deaths may have been registered earlier or later than in previous years. Consequently, comparisons of mortality between 2020, 2021 and 2022 and earlier years may not be on a like-for-like basis. Also, results for individual weeks may not be consistent between years due to the timing of public holidays.

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### TAS compliance

This paper is intended to analyse recent mortality in England & Wales. It complies with the principles in the Financial Reporting Council’s Technical Actuarial Standard “TAS 100: Principles for Technical Actuarial Work”. Any person using this paper should exercise judgement over its suitability and relevance for their purpose.



## Results – Standardised mortality rates

Chart 1 shows how SMRs in 2019, 2020, 2021 and 2022 compare to the range of SMRs in the same week in the 2011-2019 period. (Note that most years do not have a week 53 – there was no week 53 in 2019, and the 2011-2019 range for week 53 only relates to 2015.)

Standardised mortality in 2022 to date has generally been towards the bottom of the 2011-2019 range.

**Chart 1: Weekly standardised mortality rates for 2011 to 2022**

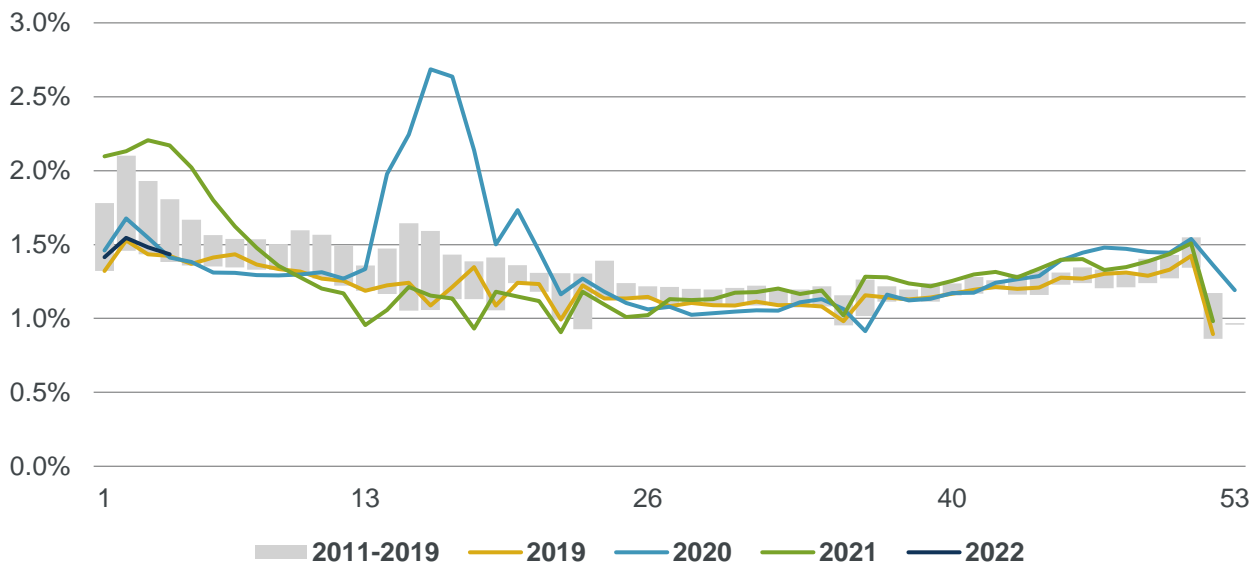
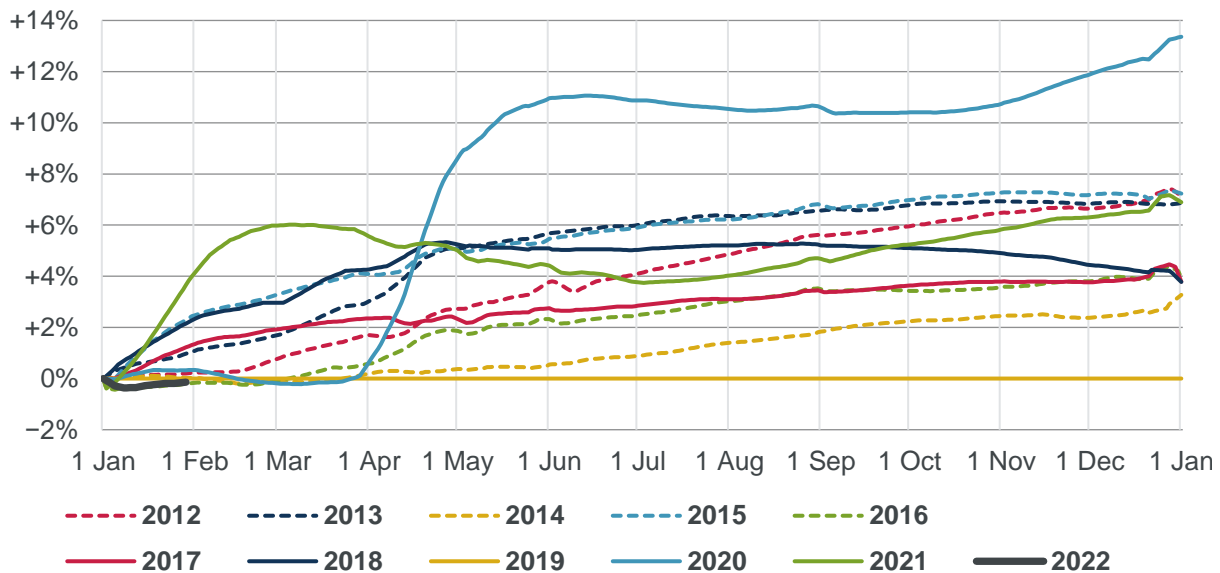


Chart 2 shows cumulative standardised mortality rates relative to 2019, as a proportion of mortality for 2019 as a whole<sup>1</sup>. Cumulative mortality to week 4 of 2022 is 0.1% below 2019.

**Chart 2: Cumulative standardised mortality rate compared to 2019**



<sup>1</sup> Showing relative mortality rather than absolute mortality makes it easier to make comparisons between years. We use 2019 as the comparator as this is consistent with the excess deaths calculations in this report.

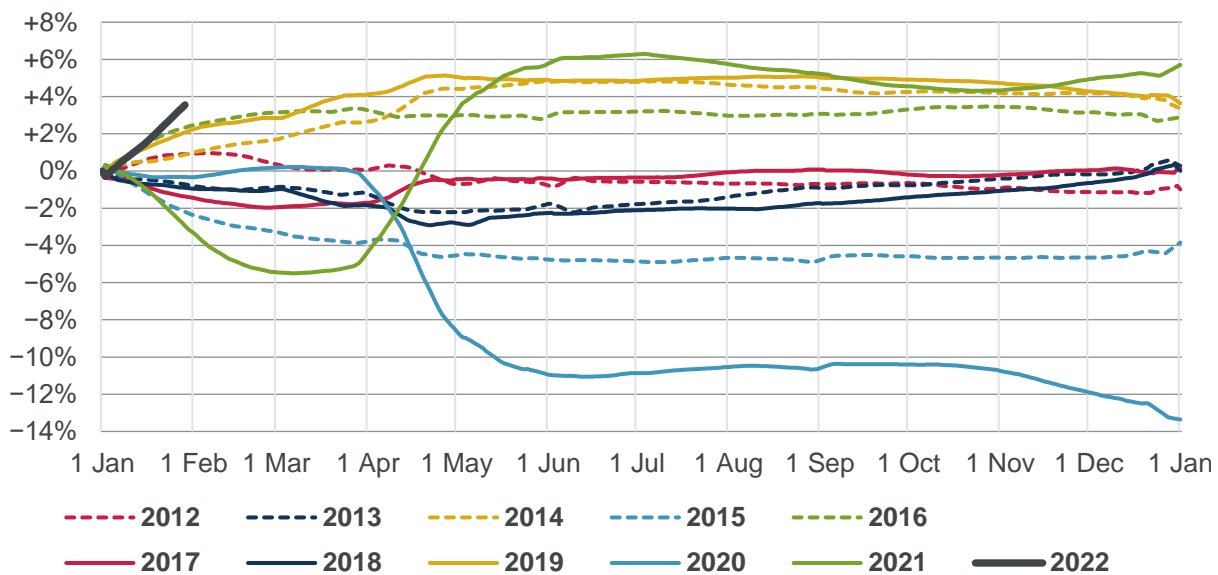


Chart 3 shows the cumulative annual standardised mortality improvement for 2022 and the previous ten years. The cumulative mortality improvement to week 4 of 2022 is +3.6%.

Please note:

- The cumulative improvement for year N is the reduction in cumulative mortality from year N-1 to year N, as a proportion of full-year mortality for year N-1.
- Chart 3 shows cumulative improvements, so a higher value represents a higher improvement and lower mortality; whereas in Chart 2 a higher value represents higher mortality.
- The cumulative mortality improvement for 2022 compares experience in 2022 to that in 2021. We have seen a mortality improvement in 2022 so far as mortality in early 2022 has been at broadly pre-pandemic levels, while mortality in early 2021 was high due to the pandemic.

**Chart 3: Cumulative annual standardised mortality improvement for 2012 to 2022**



The cumulative (non-annualised) standardised mortality improvement between 2019 and 2022 to week 4 (consistent with Chart F in the quarterly monitor) is +0.1%.

### Results – Excess and COVID-19 deaths

The ONS data shows 1,385 deaths registered during week 4 of 2022 “where COVID-19 was mentioned on the death certificate”. The overall impact of the coronavirus pandemic on total deaths may be different:

- There may have been some deaths that were wholly or partially due to COVID-19 but where COVID-19 was not mentioned on the death certificate.
- Some deaths where COVID-19 was mentioned on the death certificate may not be “excess” deaths, as the deceased might have died from another cause in the same period, in the absence of coronavirus.
- There may have been “forward mortality displacement”: some deaths that occurred earlier in the pandemic would otherwise have occurred in this period.
- There may have been indirect impacts on deaths due to restrictions on movement and changes in behaviour during the pandemic. For example, access to healthcare, reductions in other infectious diseases, and changes in traffic, pollution and mental health.



To consider the possible impact of the pandemic on total deaths, we have estimated the number of deaths that we would have seen in each week of the pandemic (in 2020, 2021 and 2022) if the SMRs for each gender and age-group had been the same in that week as in the corresponding week of 2019, the last full “normal” year before the pandemic.

As mortality in the first 12 weeks of 2019 and 2020 was similar, as seen in Charts 2 and 3, this gives a broad indication of “expected” mortality in the absence of the coronavirus pandemic. However, as there was no ISO week 53 in 2019, we have instead used week 1 of 2020 to calculate expected deaths for 53 week of 2020.

We can then subtract the expected deaths from actual deaths to estimate the “excess” deaths that, in the absence of other likely causes, may be attributable to the pandemic. Excess death calculations depend on the historical period used to estimate expected deaths. We use SMRs for 2019 to estimate expected deaths in the absence of a pandemic.

We have not made any adjustment for differences in the timing of public holidays. While such differences affect individual weeks, the positive and negative impacts for different weeks should cancel out over time in cumulative results.

Table 1 shows results for week 4 of 2022 compared to week 3 of 2022:

- Actual deaths in week 4 of 2022 were 1% higher than expected: 1% higher than expected for both males and females.
- In week 3 of 2022 deaths were 3% higher than expected: 5% higher than expected for males and 1% higher than expected for females.

**Table 1: Comparison of COVID-19 deaths and “excess” deaths**

Description	Week 4			Week 3
	Male	Female	Total	Total
“Expected” registered deaths	6,261	6,040	<b>12,301</b>	12,431
Actual registered deaths, from all causes	6,314	6,087	<b>12,401</b>	12,776
“Excess” registered deaths (actual minus expected)	53	47	<b>100</b>	345
Registered deaths where COVID-19 was mentioned on the death certificate	764	621	<b>1,385</b>	1,484
Excess as a proportion of expected	+1%	+1%	<b>+1%</b>	+3%

We note that our measure of excess deaths shows higher mortality in 2022 than in 2019, but the cumulative mortality improvement shows slightly lower mortality in 2022 than in 2019. This is because the timing of the measures of excess deaths and cumulative mortality do not align. Our excess deaths calculation compares corresponding ISO weeks, ending on Fridays, as has been the case throughout the pandemic. Year to date cumulative mortality and mortality improvements instead use the period from 1 January to align with annual measures. While the period from 1 to 28 January 2022 coincides with ISO weeks, this is not the case for 2019: weeks 1 to 4 of 2019 covers the period from 29 December 2018 to 25 January 2019.



Chart 4 compares three measures of COVID-19 mortality during the pandemic: our calculation of “excess” registered deaths from all causes, ONS data for registered deaths where COVID-19 was mentioned on the death certificate, and data for deaths of people within 28 days of a positive test result for COVID-19, from the UK Health Security Agency (UKHSA) COVID-19 dashboard.

The relationship between the three measures has varied considerably during the pandemic. Early in the pandemic, the number of excess deaths was much higher than for the other two measures, but this has not been the case since then. During the second half of 2021, all three measures tended to show broadly similar results. However, in the past three weeks ONS and UKHSA figures have risen, while excess deaths have fallen, although remaining positive. This indicates that during recent weeks non-COVID deaths have been lower than would have been expected in the absence of the pandemic. We noted possible reasons for such differences on page 3.

**Chart 4: Comparison of weekly measures of COVID-19 deaths (see text for details)**

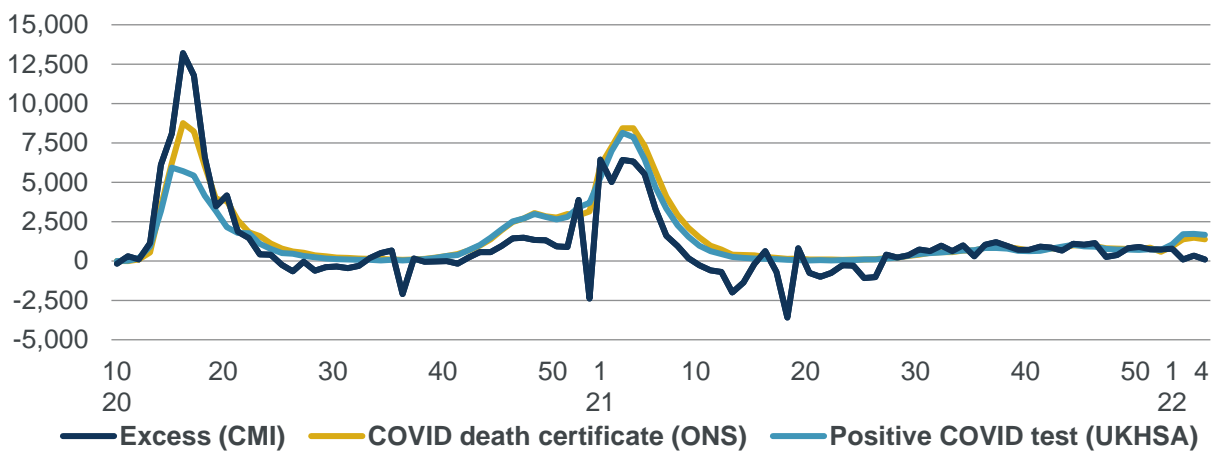
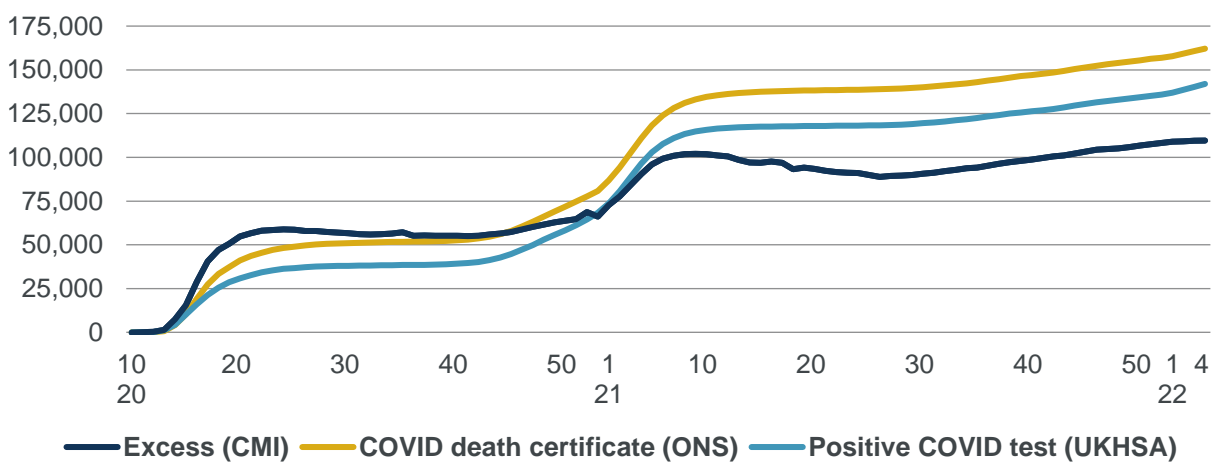


Chart 5 is similar to Chart 4, but shows cumulative numbers of deaths since week 10 of 2020. In the earlier part of the period shown, the cumulative number of excess deaths from all causes was higher than both the cumulative number of deaths where COVID-19 was mentioned on the death certificate, and the cumulative number of deaths within 28 days of a positive test. However, cumulative excess deaths are now lower than both of those measures – a consequence of weekly excess deaths being lower than the other measures, and sometimes negative.

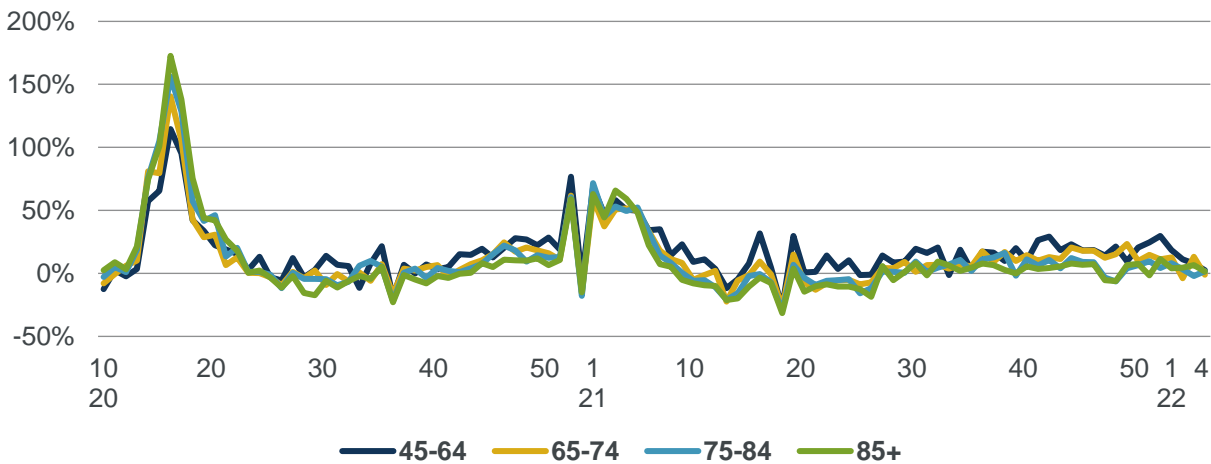
**Chart 5: Comparison of cumulative measures of COVID-19 deaths (see text for details)**



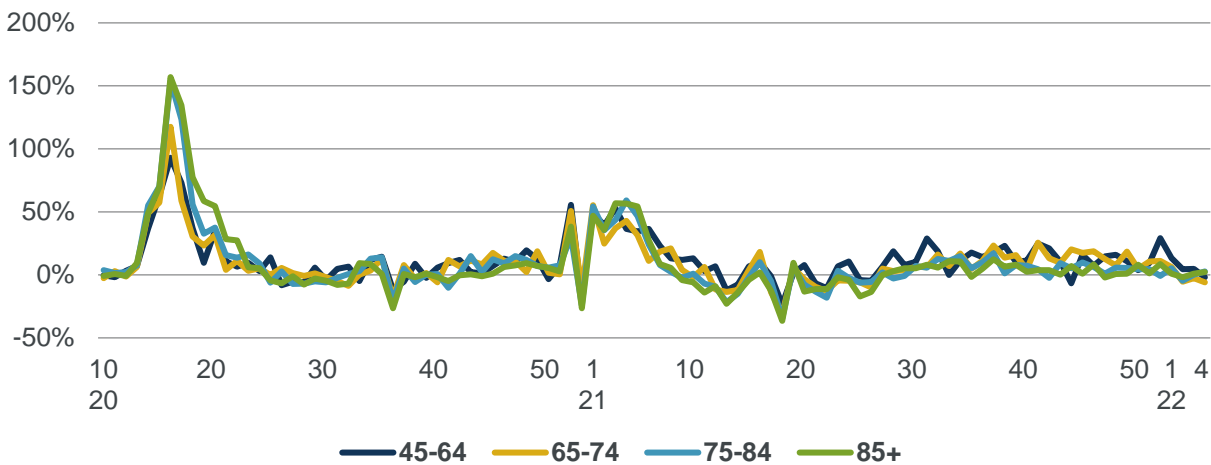


Charts 6 and 7 show excess deaths as a proportion of expected deaths by age band for each week during the pandemic. Charts 8 and 9 show the same information, for the most recent 26 weeks, in more detail. Excess deaths as a proportion of expected fell fastest for the oldest age group – consistent with the impact that we would expect to see from the coronavirus vaccination programme, as older age groups received their vaccine earlier. Since week 26 of 2021, excess deaths have risen and are positive for most age groups shown. We do not show results for ages below 45 as the relatively low numbers of deaths at those ages means that estimates of expected deaths would be unreliable.

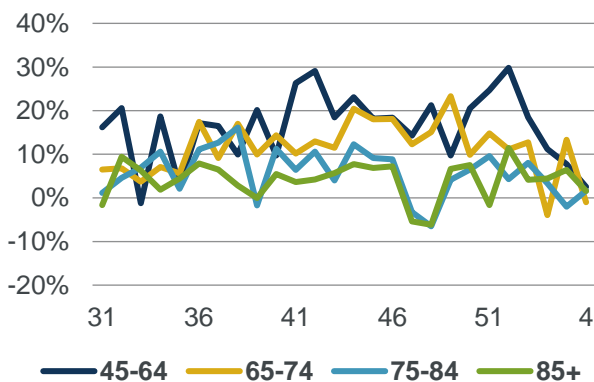
**Chart 6: Excess as a proportion of expected in each week – males (see text for details)**



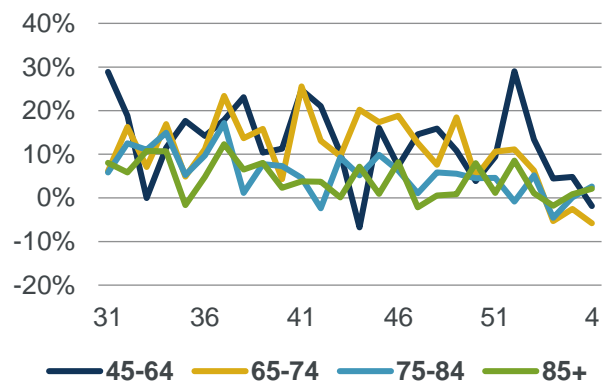
**Chart 7: Excess as a proportion of expected in each week – females (see text for details)**



**Chart 8: Recent detail of Chart 6 – males**



**Chart 9: Recent detail of Chart 7 – females**





## Results – Excess deaths for the United Kingdom

The previous sections of this report are based on registered deaths data for England & Wales to 28 January 2022, published by the ONS. In this section we extend our analysis to the United Kingdom as a whole.

We estimate that the numbers of excess deaths from the start of the pandemic to 28 January 2022 are:

- 109,600 for England & Wales<sup>2</sup>; and
- 121,700 for the United Kingdom.

Of these, 1,300 excess deaths for England & Wales and (also) 1,300 for the United Kingdom have occurred since week 1 of 2022 (1 January 2022).

As in earlier sections, excess deaths compare registered deaths to those that we would have seen if standardised mortality rates were the same as in the corresponding period in 2019. Our calculations use data for all-cause mortality from National Records Scotland (NRS) and the Northern Ireland Statistics and Research Agency (NISRA) in addition to the ONS data.

The figures above do not include deaths that occurred after 28 January 2022. We note that UKHSA publishes daily data published for deaths of people within 28 days of a positive test result for COVID-19. The UKHSA data shows 1,766 COVID-19 deaths reported for the UK in week 5 of 2022 (29 January to 4 February 2022), compared to 1,828 in week 4 of 2022.

## Data sources

The provisional weekly deaths are available from:

- ONS (England & Wales)  
<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/weeklyprovisionalfiguresondeathsregisteredinenglandandwales>
- NRS (Scotland)  
<https://data.gov.scot/coronavirus-covid-19/data.html>
- NISRA (Northern Ireland)  
<https://www.nisra.gov.uk/publications/weekly-deaths>

The daily UKHSA data for deaths of people within 28 days of a positive test result for COVID-19 are available from <https://coronavirus.data.gov.uk/details/deaths>

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<sup>2</sup> The cumulative figures since the start of the pandemic are for deaths registered from week 10 of 2020 onwards; i.e. from 29 February 2020.



## Appendix: Expected deaths for 2022

Our pandemic mortality monitors include estimates of “expected” deaths, intended to represent the broad level of deaths that we might have seen in the absence of the pandemic. The choice of measure of expected deaths is somewhat subjective, and different measures lead to different estimates of expected and hence excess deaths. This is considered in an appendix to the mortality monitor for week 53 of 2020.

In all of our pandemic mortality monitors to date, we have used SMRs in 2019 as our measure of expected deaths. We initially chose this measure because of the similarity of SMRs in the first 12 weeks of 2019 and 2020, before the pandemic had a material impact on mortality.

We have decided to continue to use mortality in 2019 to estimate expected deaths in 2022.

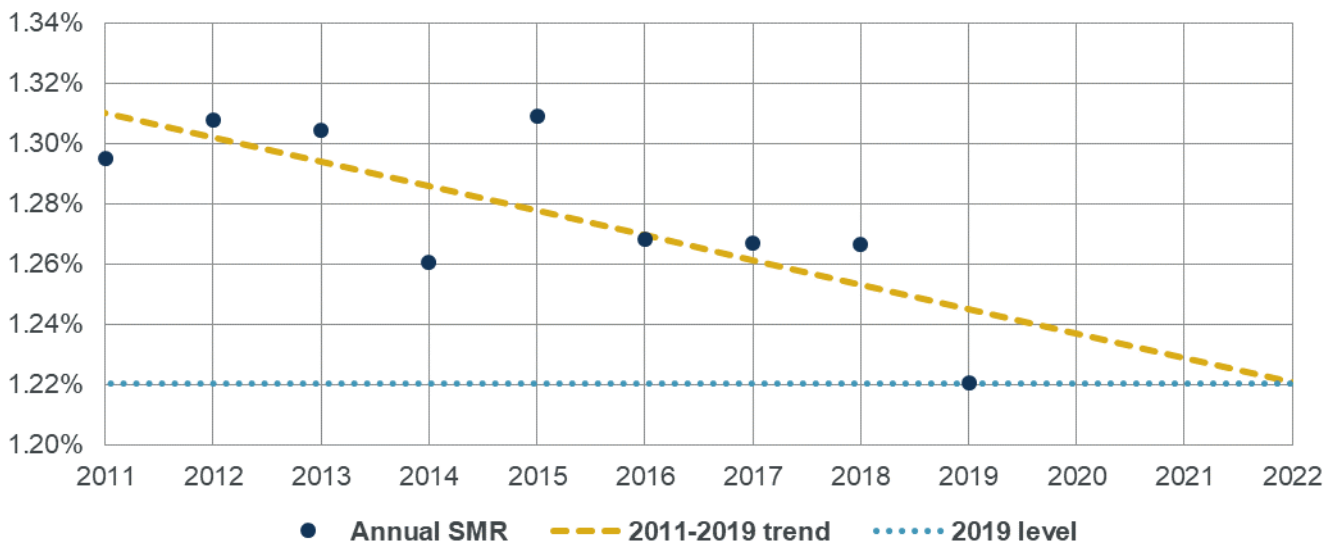
We considered whether to use another measure, primarily to reflect the mortality improvements that we might have seen between 2019 and 2022 in the absence of the pandemic. To consider this, Chart 10 plots annual SMRs for 2011-2019, compared to the 2011-2019 trend. The chart shows that extrapolating the 2011-2019 trend to 2022 would lead to a similar mortality rate as that in 2019. This suggests that:

- mortality in 2022 might not have been too different to that in 2019 in the absence of the pandemic; and
- if we are to use historical mortality to calculate expected deaths, then it is better to use 2019 than an earlier year or an average of multiple years.

Continuing to use SMRs in 2019 as our measure of expected deaths has the further advantages that:

- it is simple to explain; and
- using the same measure of expected deaths in 2022 as in earlier years means that excess deaths in 2022 will be directly comparable with those in 2020 and 2021.

**Chart 10: Standardised mortality rates for calendar years 2011 to 2019, and the 2011-2019 trend**







## Reliances and limitations

The purpose of the weekly mortality monitor is to provide regular updates on standardised mortality in England & Wales during the coronavirus pandemic, adjusting ONS data to allow for changes in the size and age of the population.

The CMI aims to produce high-quality outputs and takes considerable care to ensure that the mortality monitor and the accompanying spreadsheet of results are accurate. However:

- We cannot guarantee their accuracy (see the Disclaimer).
- There is a reliance on the data published by third parties, particularly the ONS data which is described as “provisional”.
- We have also applied judgement and assumptions in deciding on the calculation methods and the presentation of results.
  - Anyone using the results of the mortality monitor should ensure that it is appropriate for their particular use, and note that care is needed when estimating full year experience from partial year experience. This is particularly true during the coronavirus pandemic.

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