England & Wales mortality monitor – COVID-19 update – week 39 of 2021

On 12 October 2021, we updated our population estimate for the second half of 2021. This results in a slight decrease in expected deaths for weeks 27 to 38 of 2021 and a corresponding increase in excess deaths for those weeks – from 5% of expected to 7% of expected over that period. This does not affect other results, including cumulative SMRs and mortality improvements, or results for earlier weeks.

On 13 October 2021, we reissued this monitor to update references to Public Health England, which was replaced by the UK Health Security Agency and Office for Health Improvement and Disparities on 1 October 2021.

Summary

There have been around 108,100 excess deaths from all causes in the UK from the start of the pandemic to 1 October 2021. 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 39 of 2021, there were 7% 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 (restated) figure for week 38 of 2021 was 10% 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 1 October 2021 (week 39 of 2021), based on provisional deaths data published by the Office for National Statistics (ONS) on 12 October 2021.

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 40 of 2021 on Tuesday 19 October 2021.
- A more detailed "full" version, like this one, every four or five weeks. The next is planned for week 44 of 2021 on Tuesday 16 November 2021.

We also continue to publish our quarterly mortality monitor, and have published the monitor for Q3 of 2021 today, also based on provisional weekly deaths data to 1 October 2021. The next quarterly monitor is planned to be published alongside the week 52 monitor, for data to 31 December 2021, in January 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 and 2021 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.

Use of this document

The CMI disclaims any liability from use of or reliance on these calculations, including in relation to financial transactions such as longevity swaps; and the CMI does not guarantee that it will continue to publish updates. Please also see the reliances and limitations, disclaimer, and copyright notice on the final page of this document.

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 and 2021 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 2021 was above the 2011-2019 range for weeks 1 to 7, and below or toward the bottom of the 2011-2019 range for weeks 10 to 26. Since then, it has mostly been within the 2011-2019 range.

Chart 1: Weekly standardised mortality rates for 2011 to 2021

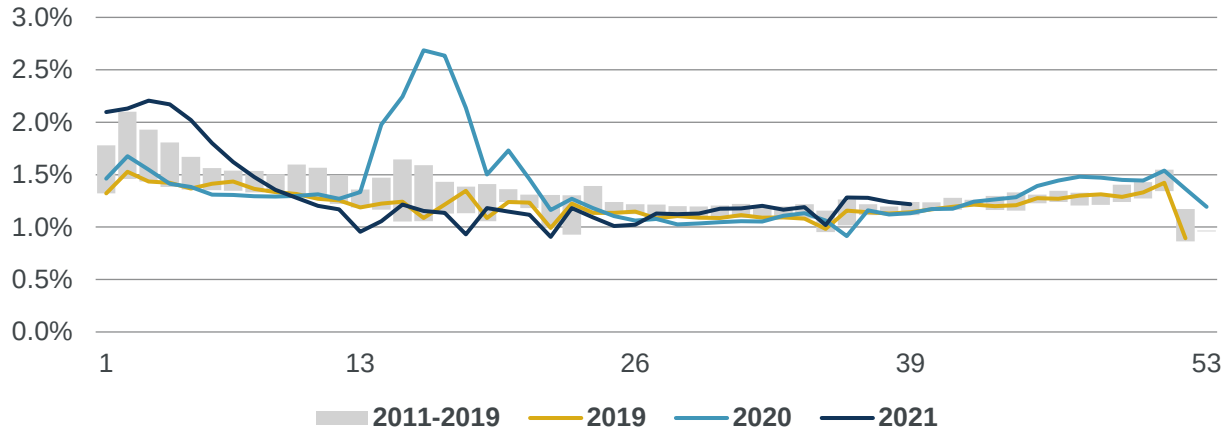
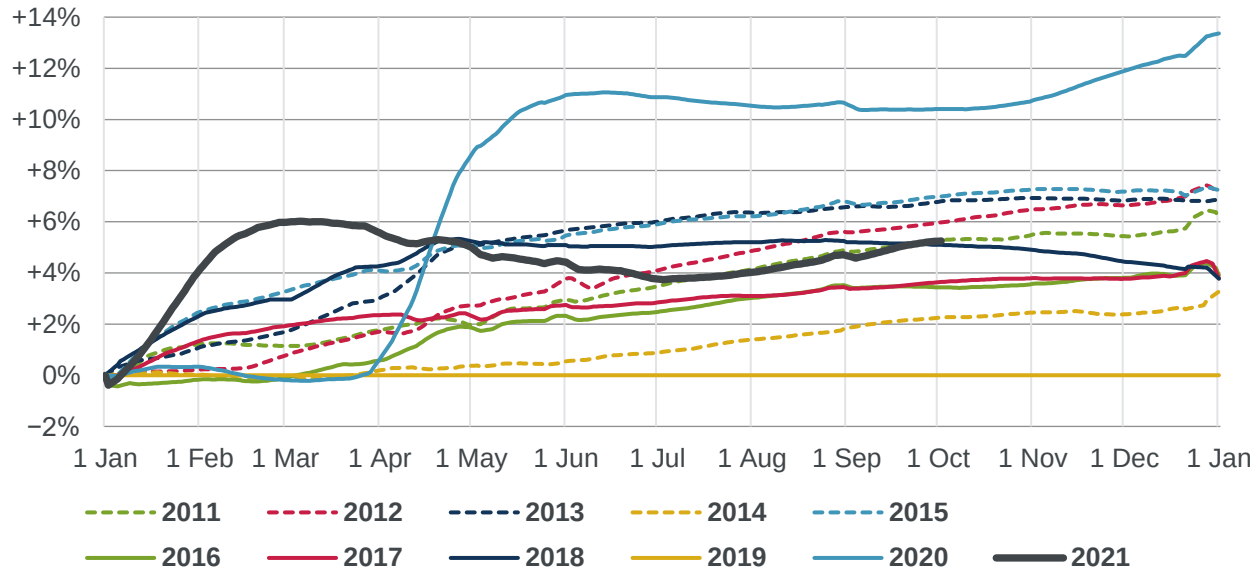


Chart 2 shows cumulative standardised mortality rates relative to 2019, as a proportion of mortality for 2019 as a whole[1]. Cumulative mortality to week 39 of 2021 is 5.3% above 2019.

Chart 2: Cumulative standardised mortality rate compared to 2019



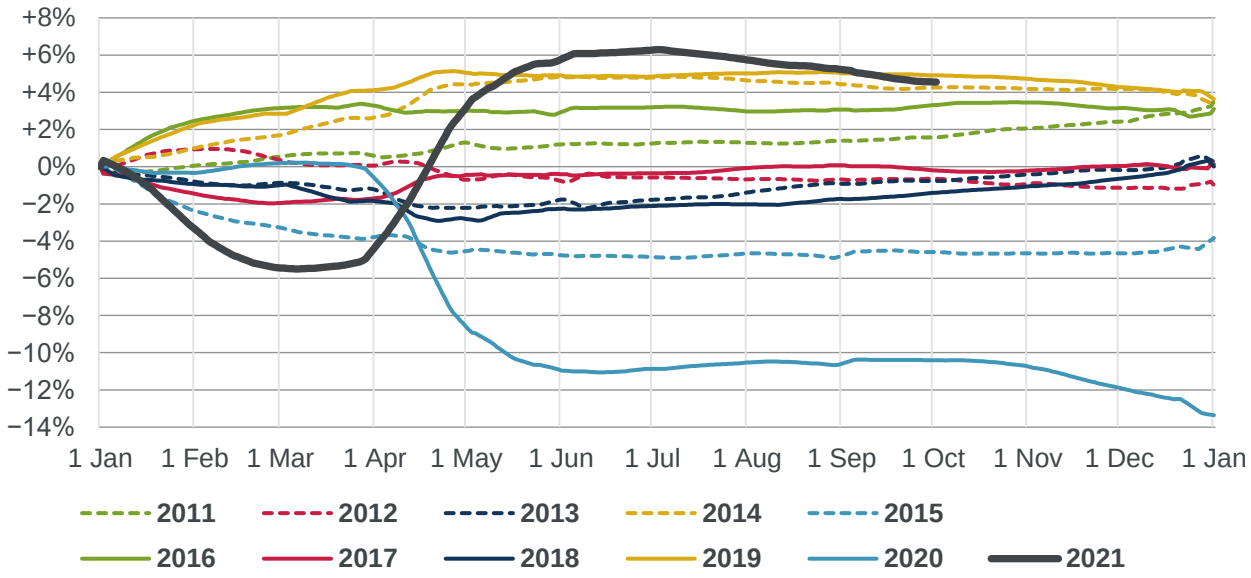
[1] Showing relative mortality rather than absolute mortality makes it easier to make comparisons between years. We previously showed mortality relative to the 2011-20 average, but now use 2019 as the comparator as this is consistent with the excess deaths calculations in this report. The CMI's mortality monitor webpage has further information on the rationale for the change to the equivalent chart in the summary pandemic monitor.

Chart 3 shows the cumulative annual standardised mortality improvement for 2021 and the previous ten years. The cumulative mortality improvement to week 39 of 2021 is +4.6%.

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.
- As the cumulative mortality improvement for 2021 compares experience in 2021 to that in 2020, we have seen a material mortality improvement in 2021 as mortality in 2021 returned to pre-pandemic levels. The increased cumulative mortality improvement during the second quarter was primarily driven by the experience of 2020.

Chart 3: Cumulative annual standardised mortality improvement for 2011 to 2021



The cumulative (non-annualised) standardised mortality improvement between 2019 and 2021 to week 39 (consistent with Chart F in the quarterly monitor) is –5.3%.

Results – Excess and COVID-19 deaths

The ONS data shows 783 deaths registered during week 39 of 2021 “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 and 2021) 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[2]. 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.

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 39 of 2021 compared to week 38 of 2021:

- Actual deaths in week 39 of 2021 were 7% higher than expected: 5% higher than expected for males and 9% higher than expected for females.
- In week 38 of 2021 (restated) deaths were 10% higher than expected: 12% higher than expected for males and 8% higher than expected for females.

Table 1: Comparison of COVID-19 deaths and "excess" deaths

Description	Week 39			Week 38 (restated)
	Male	Female	Total	Total
"Expected" registered deaths	5,066	4,744	**9,810**	9,729
Actual registered deaths, from all causes	5,315	5,195	**10,510**	10,684
"Excess" registered deaths (actual minus expected)	249	451	**700**	955
Registered deaths where COVID-19 was mentioned on the death certificate	440	343	**783**	888
Excess as a proportion of expected	+5%	+9%	**+7%**	+10%

[2] Our calculation of excess deaths depends on the historical period that we use to estimate expected deaths. If we had used the average standardised mortality rates for 2015-19 rather than only 2019 to calculate expected deaths, without allowing for mortality improvements, then this would have decreased excess deaths by 189 (from 700 to 511) in week 39 of 2021, and reduced the cumulative excess to week 39 of 2021 (shown in Chart 5) from 98,016 to 64,395, a difference of 34%. We reiterate our preference for using SMRs for 2019 to estimate expected deaths in the absence of a pandemic, as 2019 and 2020 had similar mortality experience for weeks 1 to 12.

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 wave of the pandemic, the UKHSA deaths for England & Wales increased from under 100 deaths in week 37 of 2020 to a peak of over 8,000 in week 3 of 2021, before falling to under 100 by week 21 of 2021. In recent weeks, the ONS and UKHSA measures have tended to show broadly similar results, and the UKHSA measure has risen to 641 deaths in week 39. For much of 2021 to date, excess deaths were lower than the ONS and UKHSA figures, indicating that 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. Excess deaths were negative for most of weeks 10 to 26, but have been positive since then.

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

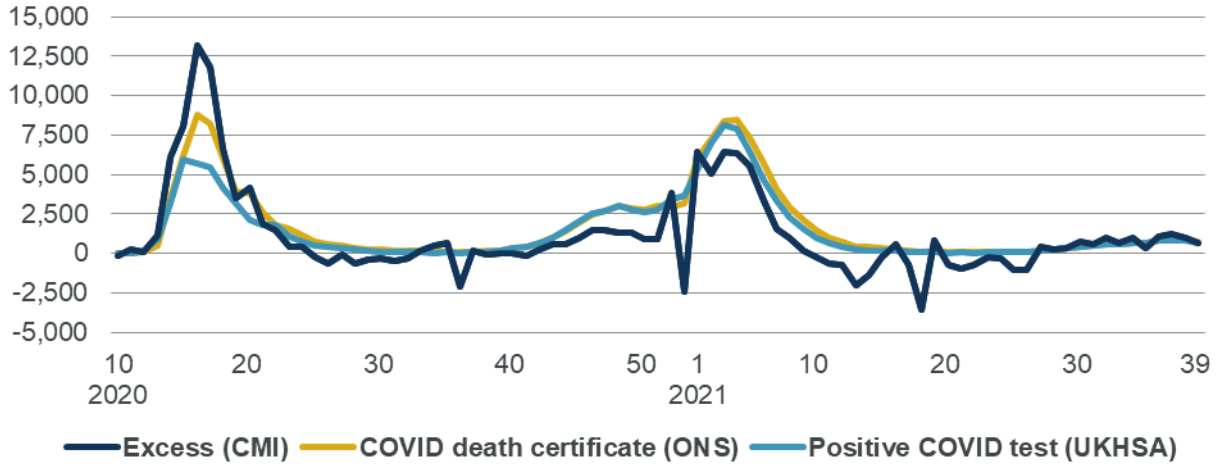
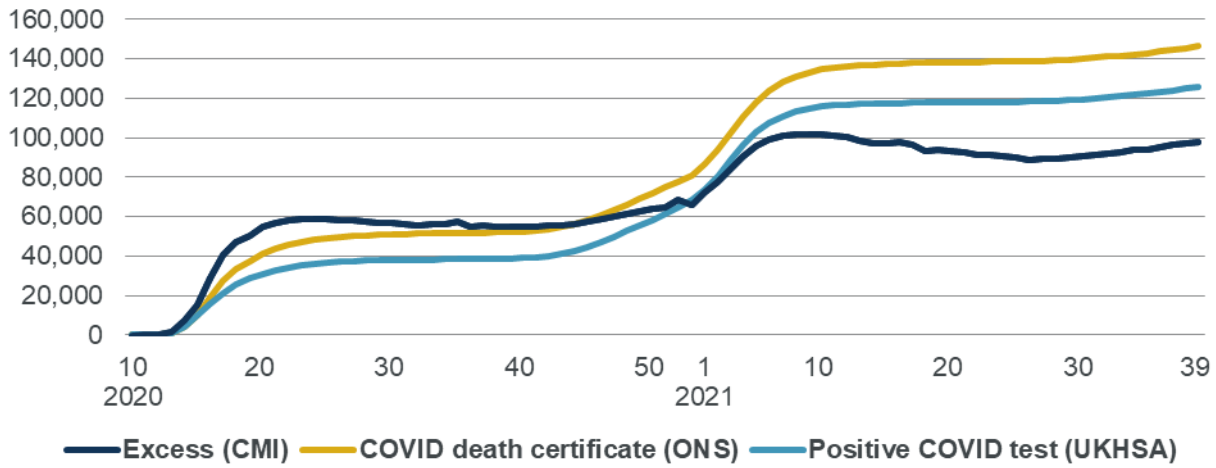


Chart 5 is similar to Chart 4, but shows cumulative numbers of deaths since week 10 of 2020. In the earlier part of the period shown, the cumulative number of excess deaths from all causes was higher than both the cumulative number of deaths where COVID-19 was mentioned on the death certificate, and 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, for many weeks in 2021.

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 2021 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. In the latest eight weeks, 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)

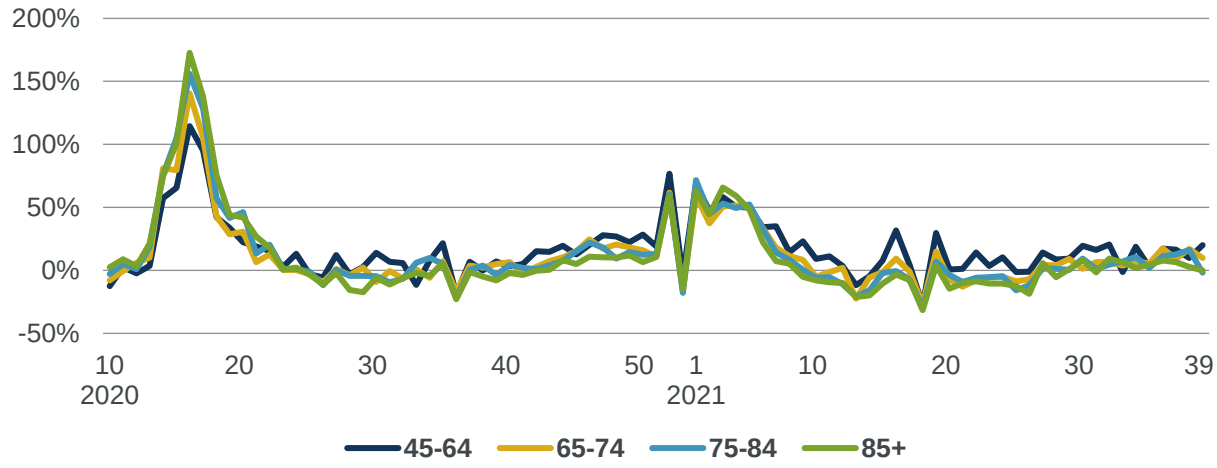


Chart 7: Excess as a proportion of expected in each week – females (see text for details)

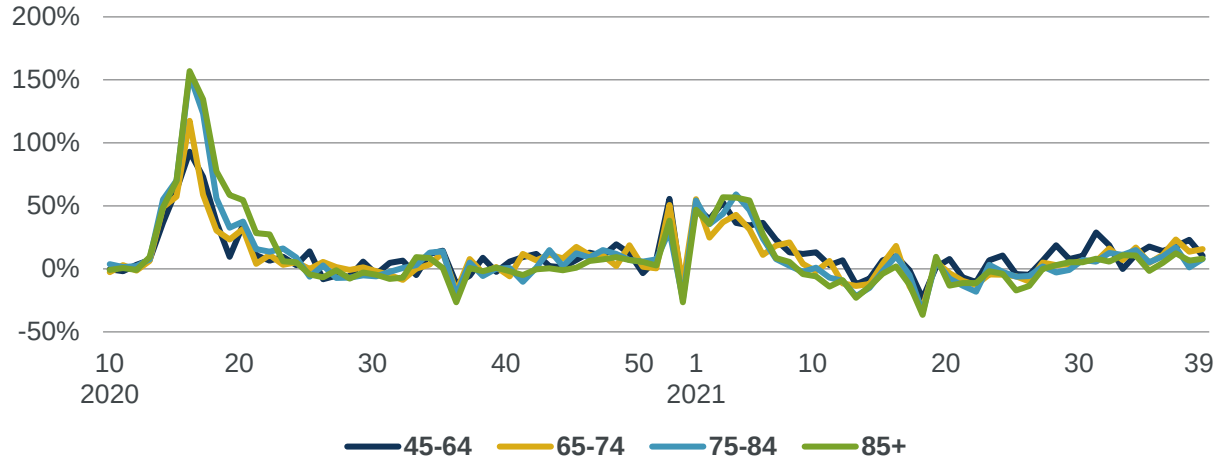


Chart 8: Detail of Chart 6 for 2021 – males

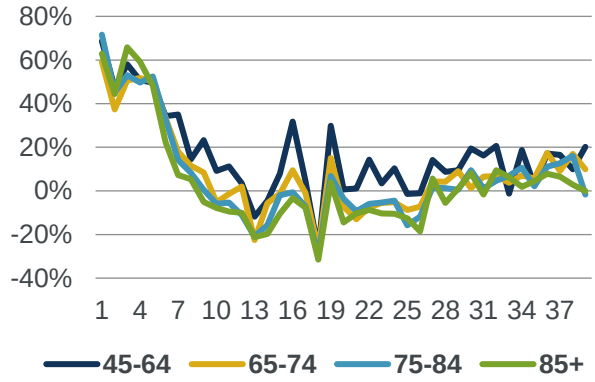
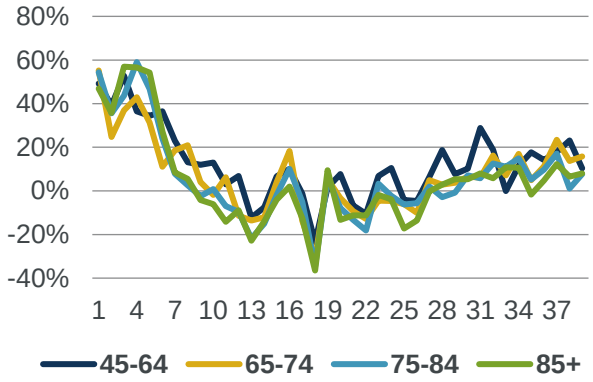


Chart 9: Detail of Chart 7 for 2021 – females



Results – Excess deaths for the United Kingdom

The previous sections of this report are based on registered deaths data for England & Wales to 1 October 2021, 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 1 October 2021 are:

- 98,000 for England & Wales[3]; and
- 108,100 for the United Kingdom.

Of these, 31,800 excess deaths for England & Wales and 35,200 for the United Kingdom have occurred since week 1 of 2021 (2 January 2021).

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 1 October 2021. 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 778 COVID-19 deaths reported for the UK in week 40 of 2021 (2 October 2021 to 8 October 2021), compared to 806 in week 39 of 2021.

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

[3] 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.

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 allowing 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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