



England & Wales mortality monitor – COVID-19 update – week 17 of 2021

Summary

There have been around 105,600 more deaths in the UK from the start of the pandemic to 30 April 2021 than 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 17 of 2021, there were 7% fewer 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 16 of 2021 was 7% more. However, we note that results for recent weeks are affected by differences in the timing of Easter bank holidays between 2019 and 2021.

This edition of the monitor contains additional “one-off” analysis on variations in mortality by Index of Multiple Deprivation (IMD). It shows that while the absolute increase in mortality during the pandemic has been greater for more deprived deciles, the relative impact has been broadly similar for all levels of deprivation.

Background

During the coronavirus pandemic we have been publishing frequent updates to the CMI Mortality Monitor. This update shows the position as at 30 April 2021 (week 17 of 2021), based on provisional deaths data published by the Office for National Statistics (ONS) on 11 May 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 18 of 2021 on Tuesday 18 May 2021.
- A more detailed “full” version, like this one, every four or five weeks. The next is planned for week 21 of 2021 on Tuesday 8 June 2021.

We also continue to publish our quarterly mortality monitor. The most recently published was for Q1 of 2021, based on provisional weekly deaths data to 2 April 2021.

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.

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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 and 2021 compare to the range of SMRs in 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 but has been below or toward the bottom of the 2011-2019 range for week 10 onwards. We note that results for recent weeks are volatile, due to differences in the timing of Easter bank holidays between 2019 and 2021.

Chart 1: Weekly standardised mortality rates for 2011 to 2021

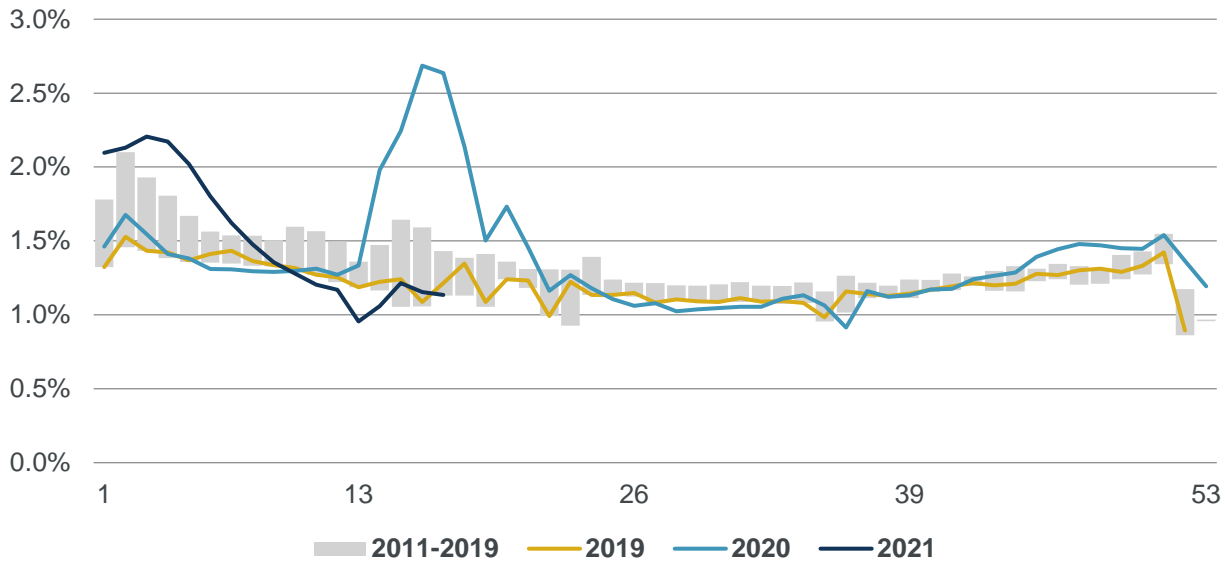
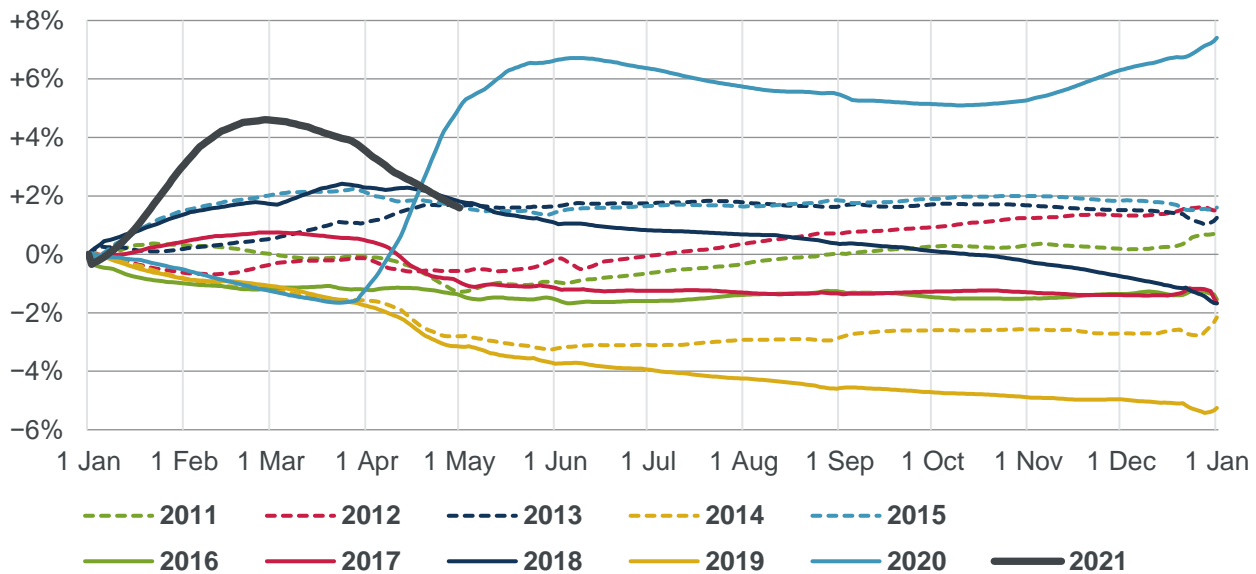


Chart 2 shows cumulative standardised mortality rates relative to the 2011-2020 average, as a proportion of a full year's mortality¹. Cumulative mortality to week 17 of 2021 is 1.6% above the 2011-2020 average.

Chart 2: Cumulative standardised mortality rate compared to the 2011-2020 average



¹ Showing relative mortality rather than absolute mortality makes it easier to make comparisons between years. The choice of 2011-2020 as a comparator is somewhat arbitrary and should not be interpreted as our expectation of mortality in 2021.

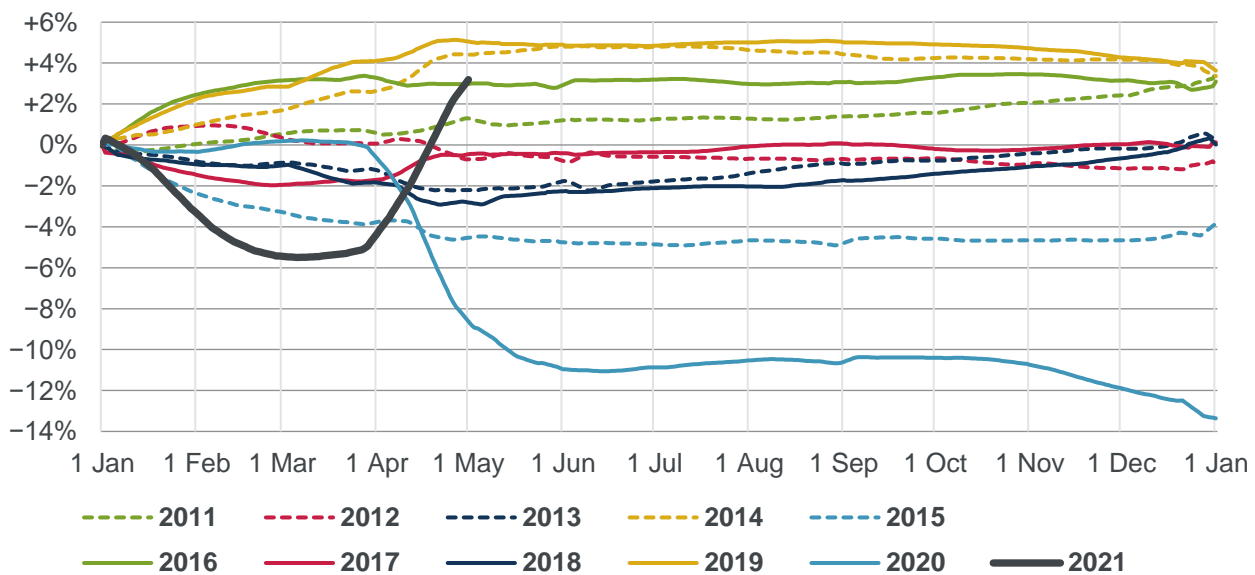


Chart 3 shows the cumulative annual standardised mortality improvement for 2021 and the previous ten years. The cumulative mortality improvement to week 17 of 2021 is +3.2%.

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, if mortality in 2021 returns to pre-pandemic levels then we would see a material mortality improvement in 2021. The uptick in recent weeks is driven by the experience of 2020.

Chart 3: Cumulative annual standardised mortality improvement



The cumulative (non-annualised) standardised mortality improvement between 2019 and 2021 (consistent with Chart F in the quarterly monitor) between 2019 and 2021 is -5.0% to week 17.

Results – Excess and COVID-19 deaths

The ONS data shows 205 deaths registered during week 17 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 pandemic². 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 17 of 2021 compared to week 16 of 2021:

- Actual deaths in week 17 of 2021 were 7% lower than expected: 4% lower than expected for males and 9% lower than expected for females.
- In week 16 of 2021 deaths were 7% higher than expected: 6% higher than expected for males and 7% higher than expected for females.
- We note that results for weeks 16 and 17 have been affected by differences in the timing of Easter bank holidays between 2019 and 2021.

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

Description	Week 17			Week 16
	Male	Female	Total	Total
“Expected” registered deaths	5,233	5,156	10,390	9,321
Actual registered deaths, from all causes	5,009	4,683	9,692	9,941
“Excess” registered deaths (actual minus expected)	-224	-473	-698	+620
Registered deaths where COVID-19 was mentioned on the death certificate	116	89	205	260
Excess as a proportion of expected	-4%	-9%	-7%	+7%

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 790 (from -698 to -1,488) in week 17 of 2021, and reduced the cumulative excess to week 17 of 2021 (shown in Chart 5) from 96,830 to 67,769, a difference of 30%. 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, ONS data for registered deaths where COVID-19 was mentioned on the death certificate, and Public Health England (PHE) data for deaths of people within 28 days of a positive test result for COVID-19.

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 PHE 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 just over 100 in week 17 of 2021. In recent weeks, the ONS and PHE measures have tended to show broadly similar results. However, excess deaths have, in general, been lower (apart from the impact of bank holidays), 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.

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

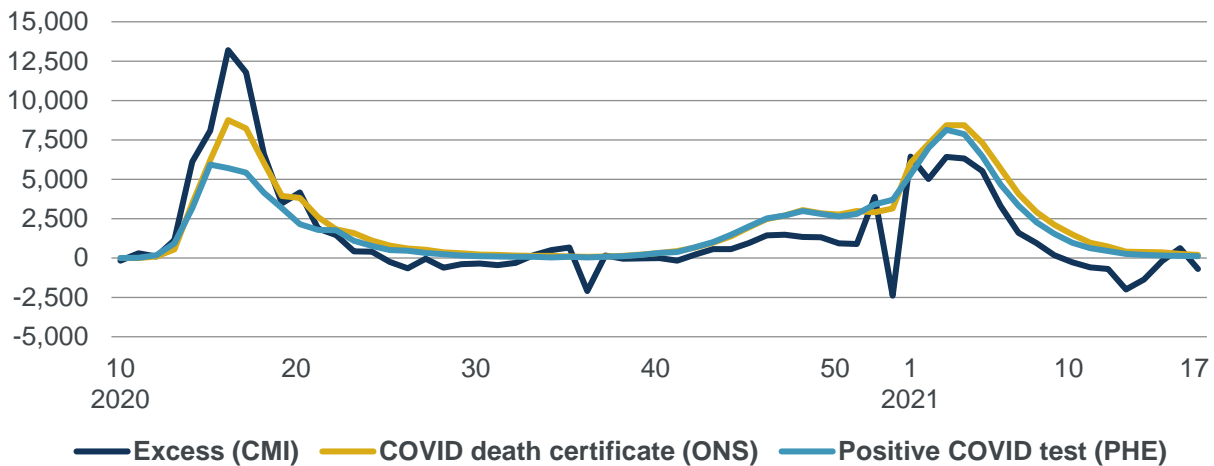
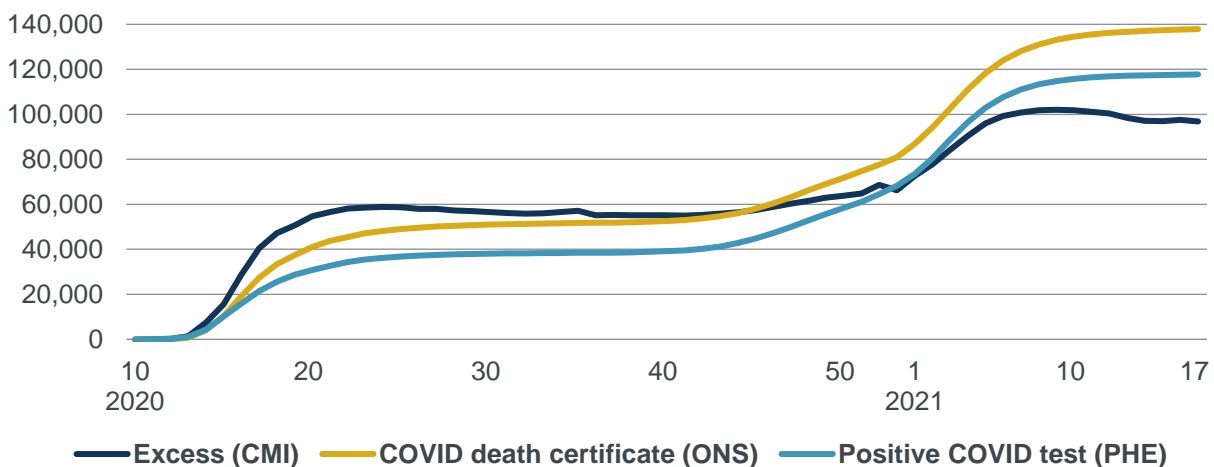


Chart 5 is similar to Chart 4, but shows cumulative numbers of deaths since week 10 of 2020. In the earlier part of the period shown, the cumulative number of excess deaths was higher than both the cumulative number of deaths where COVID-19 was mentioned on the death certificate, and the cumulative number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

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. During the period shown, excess deaths as a proportion of expected has fallen fastest for the oldest age group. This is consistent with the impact that we would expect to see from the coronavirus vaccination programme, as older age groups received their vaccine earlier. 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)

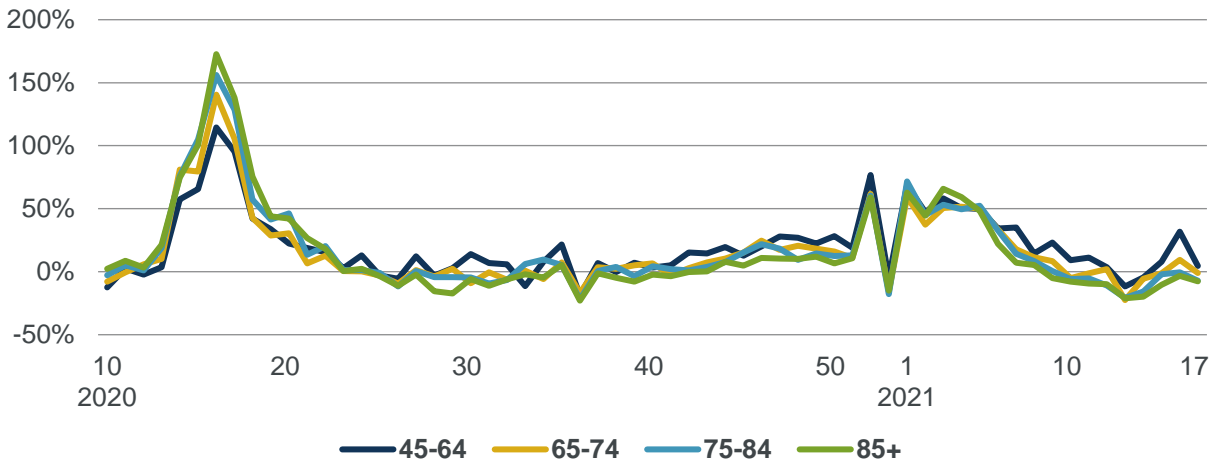


Chart 7: Excess as a proportion of expected in each week – females (see text for details)

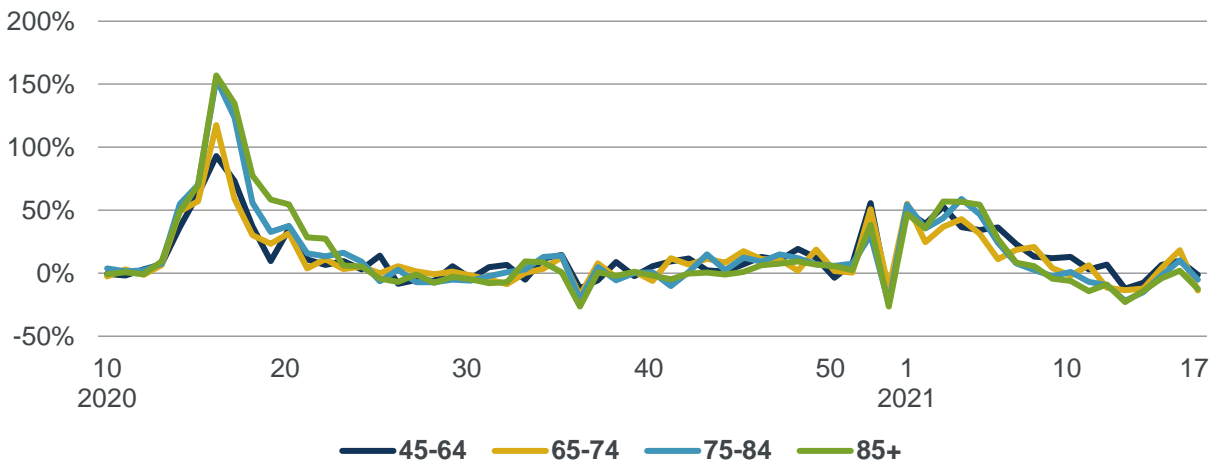


Chart 8: Detail of Chart 6 for 2021 – males

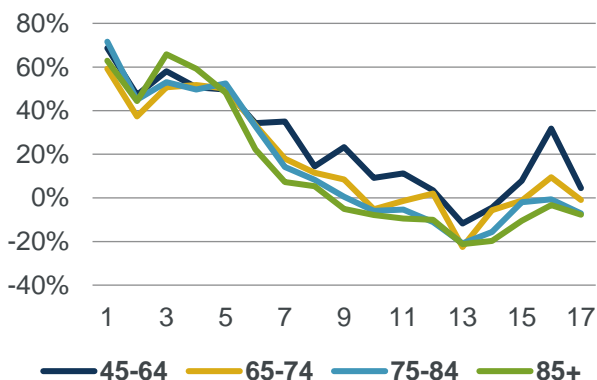
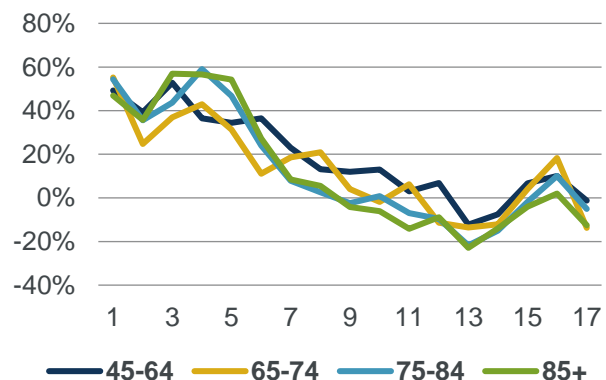


Chart 9: Detail of Chart 7 for 2021 – females





Results – Excess deaths for the United Kingdom

The previous sections of this report are based on registered deaths data for England & Wales to 30 April 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 30 April 2021 are:

- 96,800 for England & Wales³; and
- 105,600 for the United Kingdom.

Of these, 30,600 excess deaths for England & Wales and 32,600 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 30 April 2021. We note that PHE publishes daily data published for deaths of people within 28 days of a positive test result for COVID-19. The PHE data shows 81 COVID-19 deaths reported for the UK in week 18 of 2021 (1 May 2021 to 7 May 2021), compared to 132 in week 17 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 PHE 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>

The IMD data for the additional analysis is available from:

- Monthly, during the pandemic
<https://www.ons.gov.uk/file?uri=/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/deathsduetocovid19bylocalareaanddeprivation/march2021/covidlocalareadeprivationmarch2021.xlsx>
- For 2018
<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthinequalities/datasets/changingtrendsinmortalitybynationalindicesofdeprivationenglandandwales>

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.



Additional analysis – Mortality by Index of Multiple Deprivation

In this section, we consider how mortality has varied by Index of Multiple Deprivation (IMD) during the pandemic. The provisional weekly deaths data published by the ONS does not include IMD, so we have used an alternative publication, for monthly deaths from March 2020 to March 2021. This analysis updates our previous analysis by IMD included in the mortality monitor for week 26 of 2020.

Elsewhere in this report we have compared actual deaths to expected deaths, where the expected deaths are based on SMRs for 2019 SMRs. The ONS has not yet published monthly SMRs by IMD for 2019, so we cannot make the same comparison here. Instead, we compare the monthly SMRs for March 2020 to March 2021 with one-twelfth of the SMR for 2018 (the latest full year for which data is currently available). While this does not allow for seasonal variations during 2018, it provides a broad indication of how changes in mortality during the pandemic have varied by IMD.

Mortality in April 2020, January 2021 and February 2021 is highlighted, as these three months experienced the highest levels of excess mortality. All other months are shown in grey.

- Charts 10 and 11 show monthly SMRs by IMD for males and females. In all months shown, mortality has been highest for the most deprived decile (decile 1) and lowest for the least deprived decile (decile 10).
- Charts 12 and 13 show monthly SMRs in 2020 and 2021 relative to 2018. The charts show little variation by IMD, suggesting that the pandemic has tended to act more as a multiplier to mortality than as an addition. There is also limited variation between the first wave (peaking in April 2020) and the second wave (peaking in January and February 2021) of the pandemic.

Chart 10: Monthly standardised mortality rate by IMD decile – England males

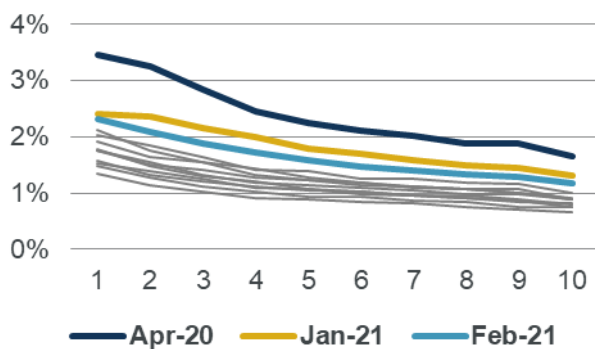


Chart 11: Monthly standardised mortality rate by IMD decile – England females

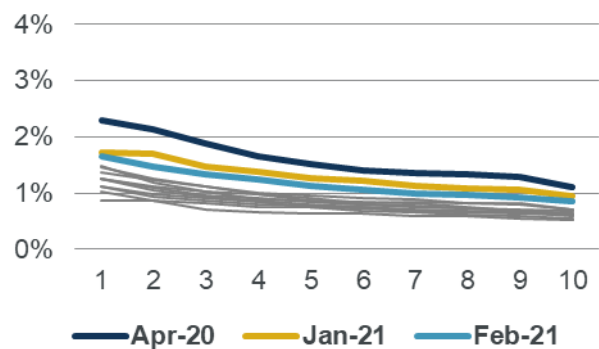


Chart 12: Standardised mortality rate relative to 2018 by IMD decile – England males

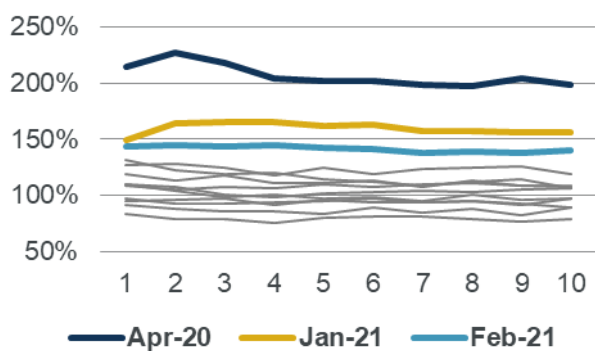
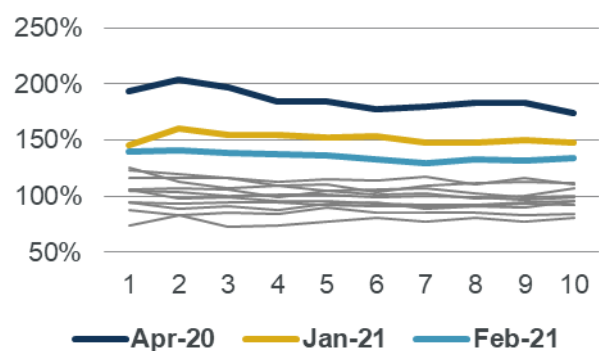


Chart 13: Standardised mortality rate relative to 2018 by IMD decile – England females



While we have only shown variations in mortality by IMD in this section, we note that the ONS has published a wealth of analysis showing material variations in mortality during the pandemic by factors including region, ethnicity, place of death (home, hospital, care home etc), urban/rural classification, and cause of death.



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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