



## England & Wales mortality monitor – COVID-19 update – week 41 of 2020

### Summary

There have been around 60,500 more deaths in the UK from the start of the pandemic to 9 October 2020 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).

During weeks 40 and 41 of 2020 combined, the period since our previous mortality monitor, there were 0.8% fewer deaths registered in England & Wales than would have been expected if Standardised Mortality Rates had been the same as in the corresponding weeks of 2019. In weeks 38 and 39 combined, there were 0.4% fewer deaths in 2020 than in the corresponding period of 2019.

The cumulative mortality improvement in England & Wales for 2020 is –10.4% as at 9 October 2020, compared to +0.1% as at 20 March 2020, before the coronavirus pandemic had a material impact.

### Background

During the coronavirus pandemic we have been publishing frequent updates to the CMI Mortality Monitor. This update shows the position as at 9 October 2020 (week 41 of 2020), based on provisional deaths data published by the Office for National Statistics (ONS) on 20 October 2020. We intend to publish the next monitor, for week 43, on 3 November 2020. 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 their own ad hoc analyses: <https://www.actuaries.org.uk/learn-and-develop/continuous-mortality-investigation/other-cmi-outputs/mortality-monitor>.

### 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 have included versions of Charts D and E from the standard quarterly monitor, which show results for males and females combined, for ages 20-100:

- Chart 1 (like Chart D from the quarterly report) shows cumulative standardised mortality for each year, relative to the average for 2010-2019.
- Chart 2 (like Chart E from the quarterly report) shows cumulative standardised mortality improvements for each year (i.e. the progression of annual mortality improvements over the course of each year).
- 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 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

Chart 1 shows cumulative standardised mortality rates compared to the 2010-2019 average. Cumulative mortality to week 41 of 2020 is higher than cumulative mortality to week 41 in any year since 2008, and is 5.4% above the 2010-19 average. It was 1.9% below the 2010-19 average at week 12, before the coronavirus pandemic had a material impact. The highest value was +7.4% at week 23.

**Chart 1: Cumulative standardised mortality rate compared to the 2010-2019 average**

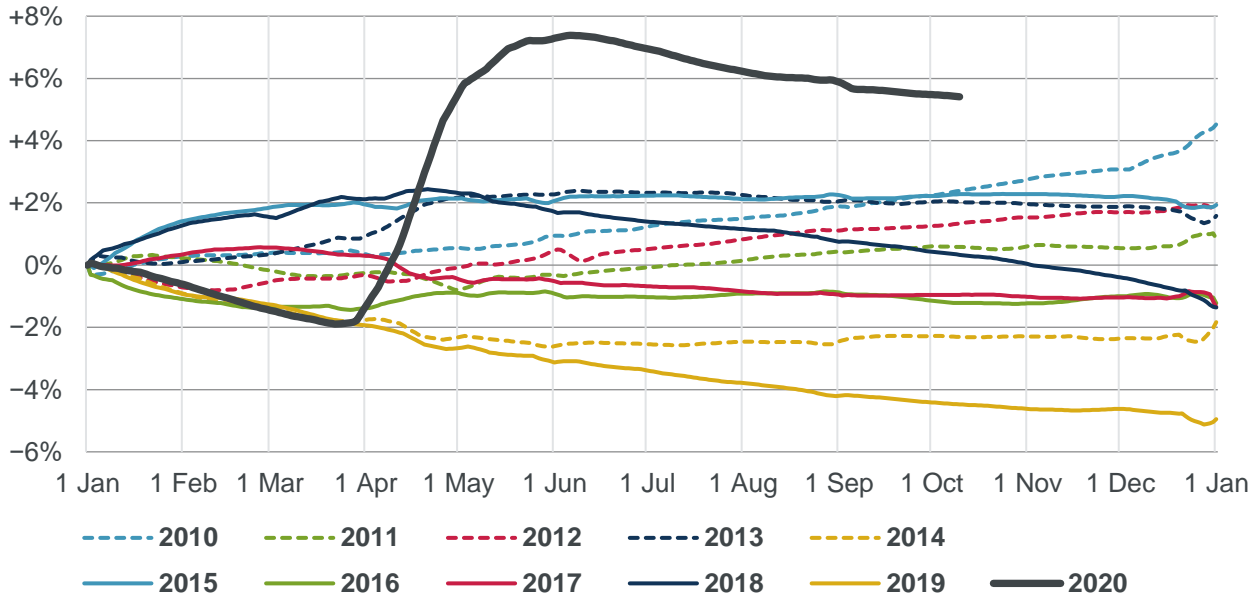
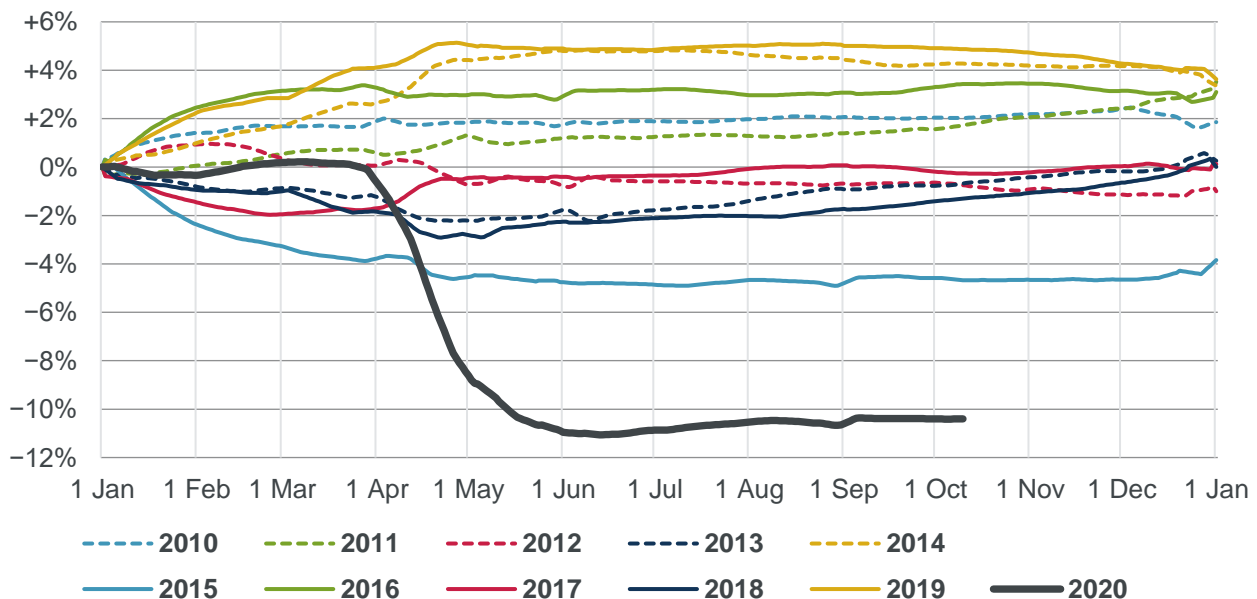


Chart 2 shows the cumulative annual standardised mortality improvement for 2020 and for the previous ten years. Note that Chart 2 shows cumulative improvements, so a higher value represents a higher improvement and lower mortality; whereas in Chart 1 a higher value represents higher mortality.

The cumulative mortality improvement is -10.4% as at 9 October 2020 (week 41 of 2020), compared to +0.1% as at week 12, before the coronavirus pandemic had a material impact. The lowest value was -11.1% as at week 24.

**Chart 2: Cumulative annual standardised mortality improvement**





## Impact of coronavirus on total deaths

The ONS data shows a total of 759 deaths registered during weeks 40 and 41 “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 the 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 due to the coronavirus; for example, 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 weeks 40 and 41 of 2020 if the SMRs for each gender and age-group had been the same in those weeks as in the corresponding weeks of 2019. As mortality in the first 12 weeks of 2019 and 2020 was similar, as seen in Charts 1 and 2, this gives a broad indication of “expected” mortality in the absence of the coronavirus pandemic<sup>1</sup>. 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 in 2019 and 2020. While such differences may affect expected, actual and excess results for individual weeks, positive and negative impacts for different weeks should cancel out over time in cumulative results.

Table 1 shows results for weeks 40 and 41, compared to weeks 38 and 39. Actual deaths have been similar to expected deaths during this period:

- Actual deaths in weeks 40 and 41 are 0.8% lower than expected: 0.4% higher than expected for males and 2.1% lower than expected for females.
- In the previous period, weeks 38 and 39, deaths were 0.2% lower than expected for males and 0.6% lower than expected for females.

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

Description	Weeks 40 and 41 of 2020			38 and 39
	Male	Female	Total	Total
“Expected” registered deaths, if SMRs were the same in 2019 and 2020	10,143	9,918	<b>20,062</b>	19,234
Actual registered deaths, from all causes	10,186	9,713	<b>19,899</b>	19,156
“Excess” registered deaths (actual minus expected)	+43	-205	<b>-163</b>	-78
Registered deaths where COVID-19 was mentioned on the death certificate	442	317	<b>759</b>	354
Excess as a proportion of expected	+0.4%	-2.1%	<b>-0.8%</b>	-0.4%

<sup>1</sup> 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 reduced excess deaths by 267 (from -163 to -430) in weeks 40 and 41 combined, and reduced the cumulative excess at week 41 (shown in Chart 4) from 54,806 to 45,645, a difference of 17%. We reiterate our preference for using 2019 to estimate expected deaths in the absence of a pandemic, as 2019 and 2020 had similar mortality experience for weeks 1 to 12.

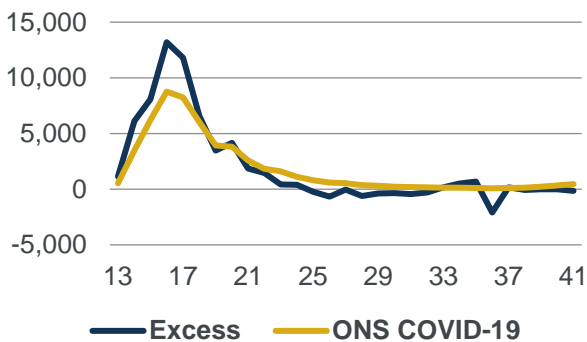


Chart 3A compares “excess” registered deaths and registered deaths where COVID-19 was mentioned on the death certificate in each week since week 13. While there were some deaths in weeks 11 and 12 where COVID-19 was mentioned on the death certificate, the level of excess deaths in those weeks is small compared to typical weekly volatility in deaths, so cannot be reliably estimated. Chart 3B is similar, but shows figures from week 23 onwards, to allow the detail of recent weeks to be seen more clearly.

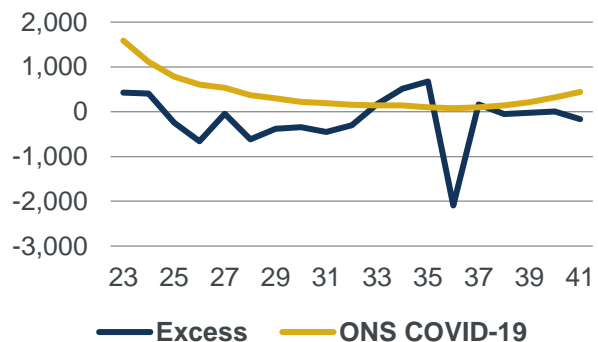
In weeks 13 to 17, the number of excess deaths was much higher than the number of deaths where COVID-19 was mentioned on the death certificate, but this is not the case in later weeks. Excess deaths were lower than mentions of COVID-19 in weeks 21 to 32, and negative in weeks 25 to 32. Excess mortality was positive in weeks 33 and 34, likely due to the heatwave from August 7 to 12. Results for weeks 35 and 36 are affected by the different timings of the late-August public holidays in 2019 and 2020.

Mentions of COVID-19 on the death certificate have risen in recent weeks, from under 100 in each of weeks 36 and week 37, to 438 in week 41. However, excess deaths have remained fairly close to zero, with excess deaths being negative in week 41.

**Chart 3A: Comparison of deaths registered in each week (see text for details)**

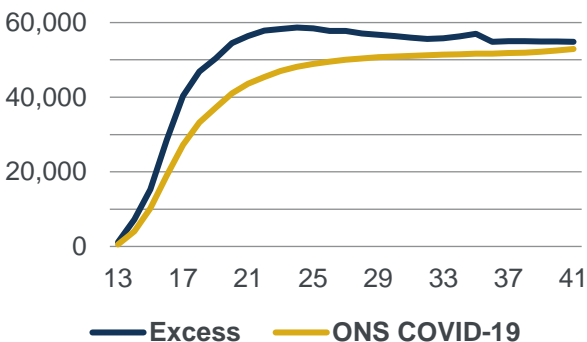


**Chart 3B: Version of Chart 3A from week 23 onwards**

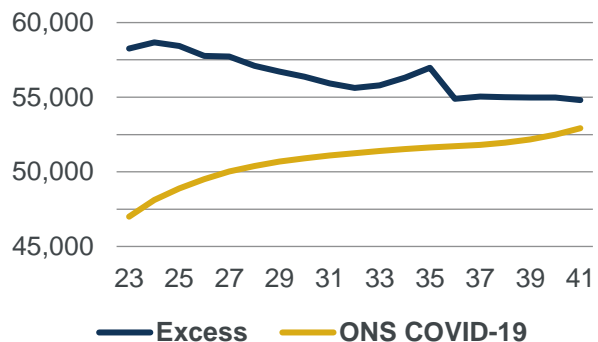


Charts 4A and 4B are similar to Charts 3A and 3B, but plot the cumulative numbers of deaths, since week 13. They show that cumulative excess mortality at week 41 is similar to week 39. Cumulative excess mortality remains higher than the cumulative number of deaths where COVID-19 was mentioned on the death certificate.

**Chart 4A: Comparison of cumulative registered deaths (see text for details)**



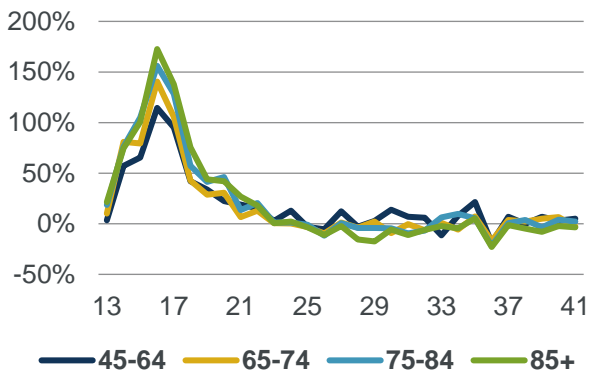
**Chart 4B: Version of Chart 4A from week 23 onwards**



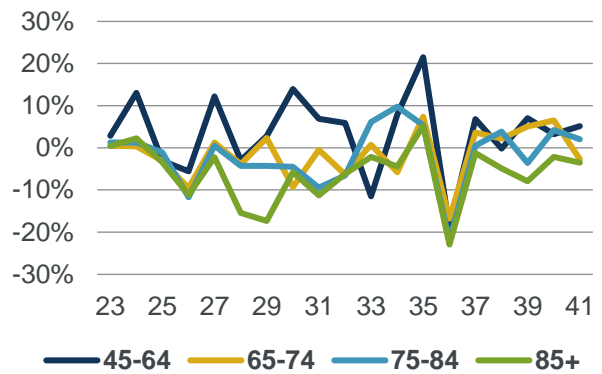


Charts 5A, 5B, 6A and 6B show excess deaths as a proportion of expected deaths by age band for each week. This tended to be higher for older age bands earlier in the pandemic, but shows some signs of being lower for ages 85+ males in recent weeks. We do not show results for ages below 45 as the relatively low numbers of deaths at those ages means that estimates of expected deaths would be unreliable. Similarly, we no longer show a table of excess mortality by age band, as the figures have become more uncertain as the numbers of deaths have reduced.

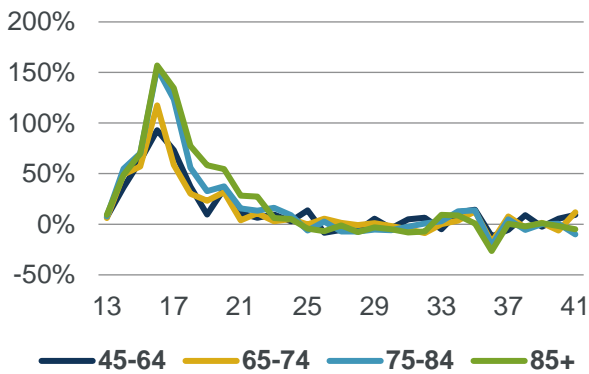
**Chart 5A: Excess as a proportion of expected in each week – males (see text for details)**



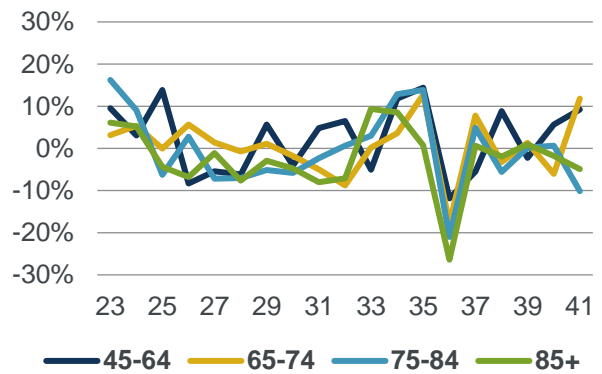
**Chart 5B: Version of Chart 5A from week 23 onwards**



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



**Chart 6B: Version of Chart 6A from week 23 onwards**





## Excess deaths for the United Kingdom

The previous sections of this report are based on data for England & Wales, published by the ONS. In this section we consider excess deaths for the United Kingdom as a whole.

We estimate that the numbers of excess deaths from the start of the pandemic to 9 October 2020 are:

- 55,000 for England & Wales<sup>2</sup>; and
- 60,500 for the United Kingdom.

In each case, the excess figure is calculated relative to the number of deaths expected if mortality rates were similar to those experienced in 2019.

Up to week 28, we derived our UK estimate from our England & Wales estimate by using data published by Public Health England (PHE) for England, and the Department of Health and Social Care (DHSC) for the devolved administrations of Northern Ireland, Scotland and Wales. This data relates to deaths of people who have had a positive test result for the coronavirus confirmed by a Public Health or NHS laboratory.

Following concerns that the PHE/DHSC figures may not have been recorded consistently across the UK, we revised our method. We now work directly with weekly data for all-cause mortality from National Records Scotland (NRS) and the Northern Ireland Statistics and Research Agency (NISRA).

We note that the week 41 figure for Northern Ireland is not yet available. However, this is unlikely to materially affect our estimate as excess mortality in Northern Ireland in recent weeks has been small, between +24 and +61 in each of the past four weeks for which we have data.

## Data sources

The provisional weekly deaths are available from:

ONE (England & Wales):

<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/weeklyprovisionalfiguresondeathsregisteredinenglandandwales>

NRS (Scotland): <https://data.gov.scot/coronavirus-covid-19/data.html> (This is a different URL to that for the week 32 mortality monitor, as the previous source is being updated less frequently)

NISRA (Northern Ireland): [https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/Weekly\\_Deaths.xls](https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/Weekly_Deaths.xls)

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<sup>2</sup> This cumulative figure, since the start of the pandemic, is slightly different to that in footnote 1, which shows the cumulative figure since week 13.





## 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 the ONS and 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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