



England & Wales mortality monitor – COVID-19 update – week 28 of 2020

Summary

There have been around 61,800 more deaths in the UK from the start of the pandemic to 10 July 2020 than if mortality rates were similar to those experienced in 2019.

There were 7% fewer deaths registered in England & Wales in week 28 of 2020 than would have been expected if standardised mortality rates had been the same as week 28 of 2019. Mortality was 0.5% lower in week 27 and 7% lower in week 26 than in the corresponding weeks of 2019.

The cumulative mortality improvement in England & Wales for 2020 is –10.8% as at 10 July 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 10 July 2020 (week 28 of 2020), based on provisional deaths data published by the Office for National Statistics (ONS) on 21 July 2020. The previous monitor was for week 26, and we intend to publish the next, for week 30, on 4 August 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 weeks 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.

Use of this document

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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 28 of 2020 is higher than cumulative mortality to week 26 in any year since 2007, and is 6.7% 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

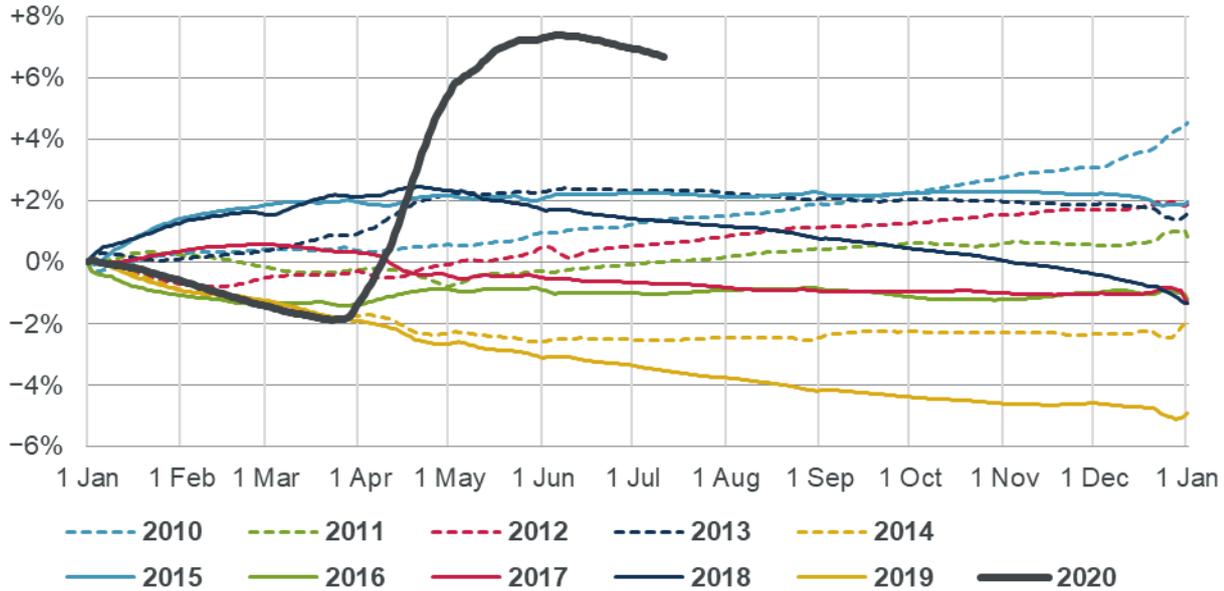
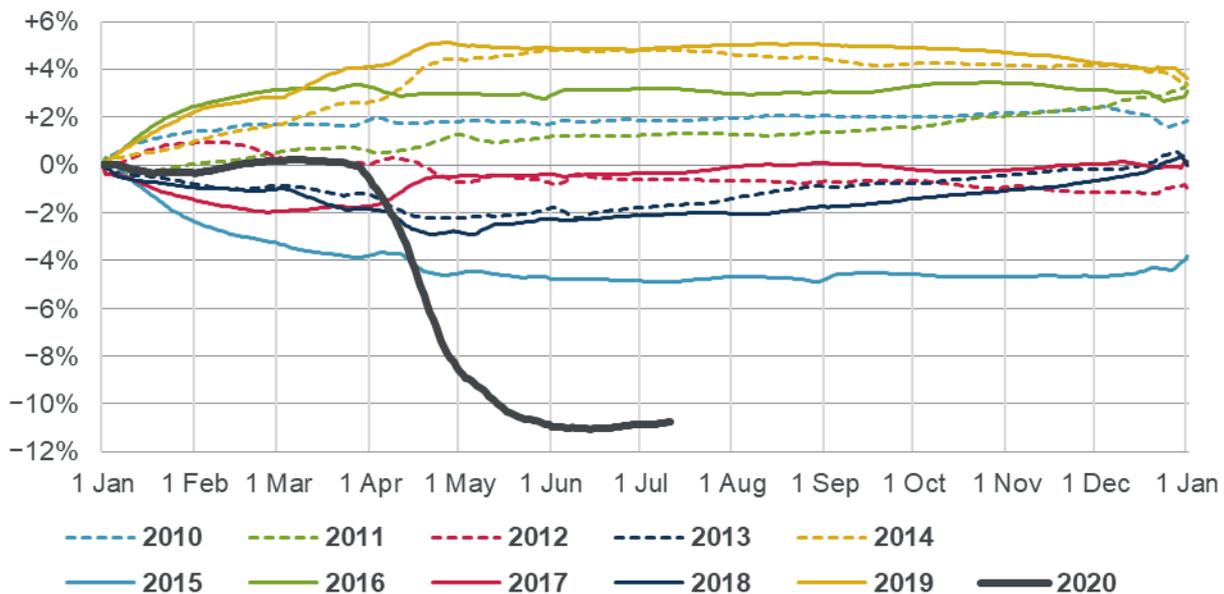


Chart 2 shows the cumulative annual standardised mortality improvement for 2020 and for the previous ten years. Note that Chart 2 shows cumulative improvements, so a higher value represents a higher improvement and lower mortality; whereas in Chart 1 a higher value represents higher mortality.

The cumulative mortality improvement is -10.8% as at 10 July 2020 (week 28 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 366 deaths registered in week 28 “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 week.
- 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 week 28 of 2020 if the SMRs for each gender and age-group had been the same in week 28 of 2020 as in week 28 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 pandemic¹. 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 week 28, and for week 27, for which we did not produce a mortality monitor:

- Actual deaths in week 28 are 7% lower than expected: 7% lower than expected for males and 6% lower for females. In week 27 they were 0.5% lower than expected: 1% higher for males and 2% lower for females.
- Weeks 25 to 28 are the only weeks since late March that mortality in 2020 has been lower than in 2019.
- Although excess deaths are negative, there were 366 registered deaths reported by the ONS in week 28 where COVID-19 was mentioned on the death certificate.

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

Description	Week 28 of 2020			Week 27
	Male	Female	Total	Total
“Expected” registered deaths, if SMRs were the same in 2019 and 2020	4,754	4,550	9,304	9,184
Actual registered deaths, from all causes	4,410	4,280	8,690	9,140
“Excess” registered deaths (actual minus expected)	-344	-270	-614	-44
Registered deaths where COVID-19 was mentioned on the death certificate	202	164	366	532
Excess as a proportion of expected	-7%	-6%	-7%	-0.5%

¹ 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 the excess deaths by 402 (from -614 to -1,016) in week 28, and reduced the cumulative excess at week 28 (shown in Chart 4) from 57,104 to 50,538, a difference of 11%. 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 3 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 4 is similar to Chart 3, but plots the cumulative numbers of deaths, since week 13.

The number of excess deaths was much higher than the number of deaths where COVID-19 was mentioned on the death certificate in weeks 13 to 17, but this is not the case in later weeks. Excess deaths have been lower than mentions of COVID-19 in weeks 21 to 28, and negative in weeks 25 to 28.

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

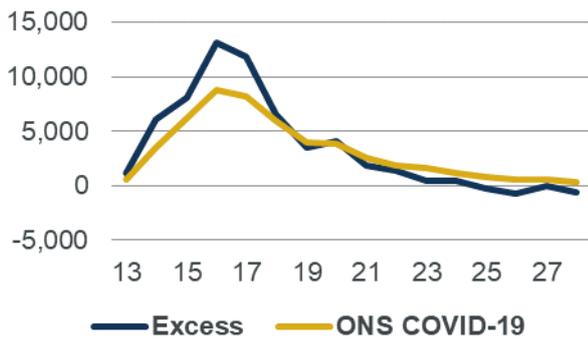
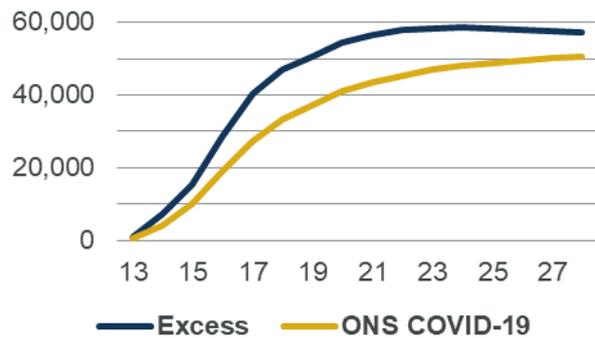


Chart 4: Comparison of cumulative registered deaths (see text for details)



Charts 5 and 6 show excess deaths as a proportion of expected deaths by age band for each week. This has tended to be higher for older age bands throughout the pandemic. 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 5: Excess as a proportion of expected in each week – males (see text for details)

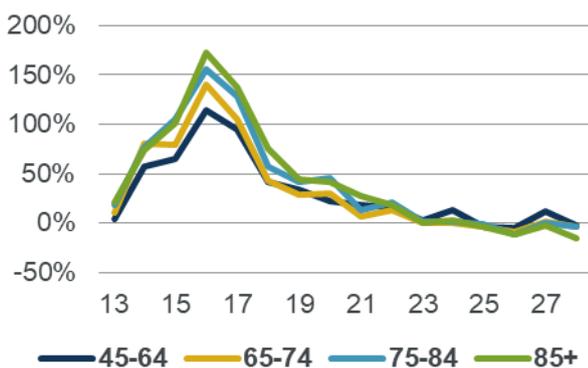
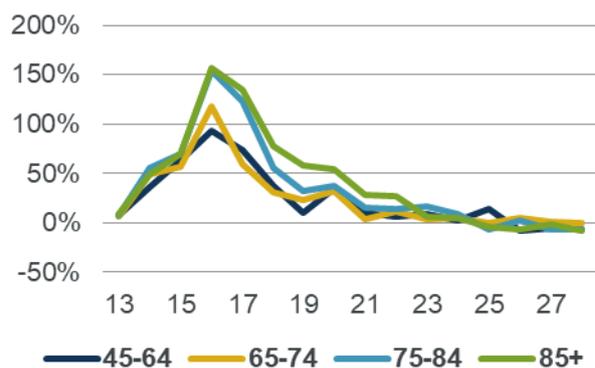


Chart 6: Excess as a proportion of expected in each week – females (see text for details)





Deaths not reported yet

Previous monitors have included 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, on deaths of people who have had a positive test result for the coronavirus confirmed by a Public Health or NHS laboratory. Although these figures are not directly comparable to the ONS figures, they had some value earlier in the pandemic as they were published sooner than the ONS figures, so provided an earlier indication of how deaths from the pandemic might progress.

At this stage of the pandemic, with excess deaths being negative, we no longer see a benefit in including the PHE/DHSC figures. Excess deaths could be materially affected not only by COVID-19 deaths, but also by improvements in non-COVID mortality rates, misattribution of cause of death, forward mortality displacement, and statistical noise.

Specifically, on 17 July the Secretary of State for Health and Social Care, Matt Hancock, asked Public Health England (PHE) to urgently review the way that daily death statistics are currently reported. The method used counts all people who have tested positive for coronavirus and since died, with no cut-off between time of testing and date of death, and there are concerns that the lack of a cut-off may distort the current daily deaths number.

Our calculations of excess mortality for England & Wales are unaffected by this, as they only rely on total deaths, and not cause of death.

We estimate that there have been around 61,800 more deaths in the UK from the start of the pandemic to 10 July 2020 than if mortality rates were similar to those experienced in 2019. We note that this estimate relies on the implicit assumption that PHE/DHSC figures have been recorded consistently across the UK, which appears not to be the case. However, we don't believe that our estimate of UK excess deaths is materially affected.

Data source

The ONS provisional weekly deaths are available from:

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



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 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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