



Friday Report: Issue 72

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Covid-19 Actuaries Response Group – Learn. Share. Educate. Influence.

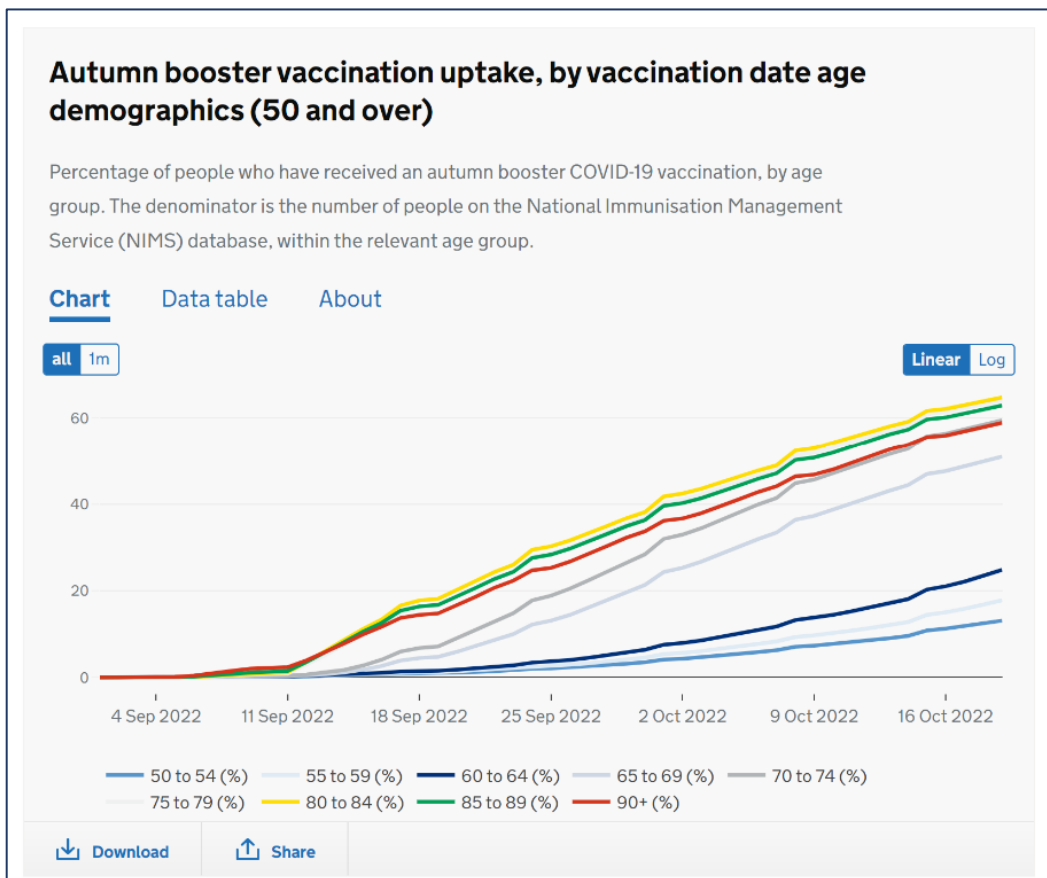
Covid-19 is still among the most important health topics for scientific papers and articles. The Covid-19 Actuaries Response Group continues to focus on important Covid-related topics. The group produces an update on the last Friday of every month with a summary of key papers, articles and data.

Vaccines and hybrid immunity

Autumn Booster Progress [\(link\)](#)

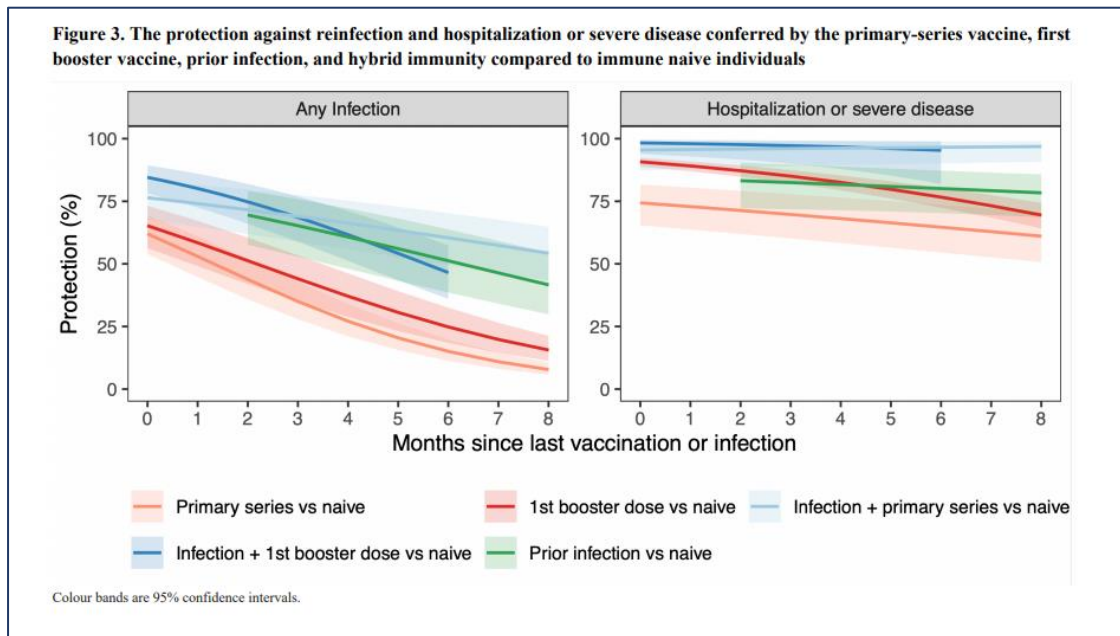
Recent weeks has seen steady progress in the autumn booster campaign, with some of the oldest age groups (75-89) with a take-up of around 70% now, and still increasing. In the Spring booster campaign there was a take-up of around 80% in those age groups, so there is still a little way to match that performance.

In total around 10.4m of over 50s have now received their autumn jab, around 45% of the total, though as can be seen below, take up by people in their fifties is still below 20%.



Effectiveness of vaccine and prior infection against Omicron infection and severe disease

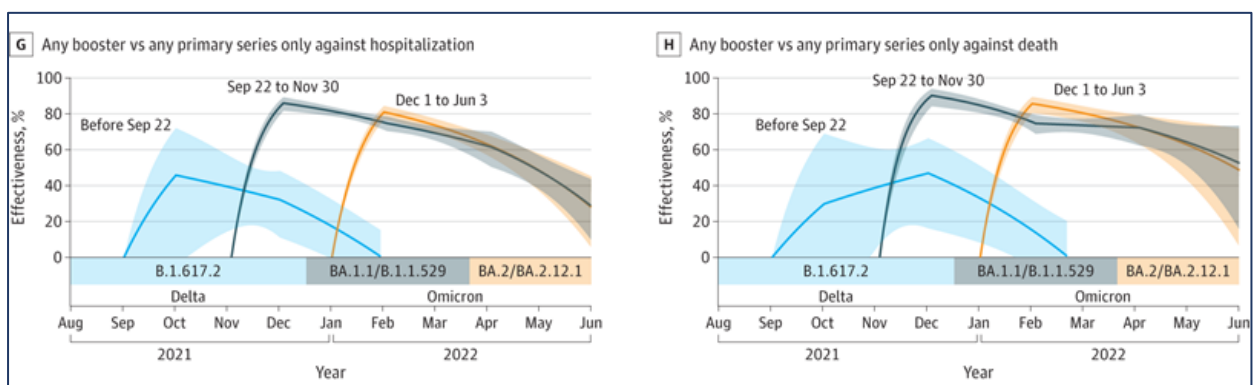
A pre-print meta-analysis ([link](#)) has found that people with hybrid immunity (vaccines plus prior infection) have the greatest and most sustained protection against Omicron infection and severe disease. Prior infection is also found to provide greater and more sustained protection than vaccination alone. Protection against infection wanes quickly for all forms of prior exposure, but remains high against severe disease.



Association of Primary and Booster Vaccination and Prior Infection With SARS-CoV-2 Infection and Severe COVID-19 Outcomes ([link](#))

A cohort study of 10.6 million North Carolina residents found that a primary course of vaccination offered 90% protection against severe outcomes soon after vaccination but this waned to 70% after 12 months. A booster vaccination restored effectiveness against severe outcomes to 90% soon after boosting but waned over 4 to 6 months. This lends support to the need for further boosting to maintain protection.

Effectiveness of Booster Vaccination Relative to Primary Series only by Date of Booster in Reducing the Risk of SARS-CoV-2 Hospitalisation or Death



The study also compared severe COVID outcome risk for those who had survived a previous COVID infection with the risk for those who had no documented previous infection. Their models adjusted for a number of factors, including vaccination status, and suggested that survivors of prior infection have around 90% lower risk of COVID death.

Nasally Administered Vaccine Trial by AstraZeneca Disappoints [\(link\)](#)

Last month we reported on the introduction of vaccines administered nasally or orally in China and India. Closer to home however, there was disappointing news from AstraZeneca, with a small trial of 30 (vaccine naïve) participants of a nasally administered vaccine failing to produce the desired level of antibody response. In particular, the response was less than had the vaccine been administered by intramuscular injection.

A further 14 people who had previously been vaccinated received a booster dose nasally, but the study concluded that there was insufficient evidence of a clear boosting effect to take the study further.

Pfizer Bivalent Vaccine News [\(link\)](#)

In marked contrast to the UK, where 5 to 11 year olds are no longer routinely offered a COVID vaccine, in the US, Pfizer has received Emergency Use Authorisation for a 10microgram dose of its bivalent BA.4/BA.5 adapted vaccine for 5 to 11 year olds.

The following day, Pfizer also announced preliminary results of trials of the bivalent vaccine in over 18 year olds as a booster [\(link\)](#). There were 80 participants, of whom 50% were over 55. The immune response was measured at 7 days, and was described as more limited in those receiving the original vaccine when compared with the bivalent version. However, no data were given to support this statement.

The company implied it will release further data once the measurements made at the one month point of the study have been analysed.

Moderna Reports Superior Response in its Bivalent BA.1 Vaccine as Booster [\(link\)](#)

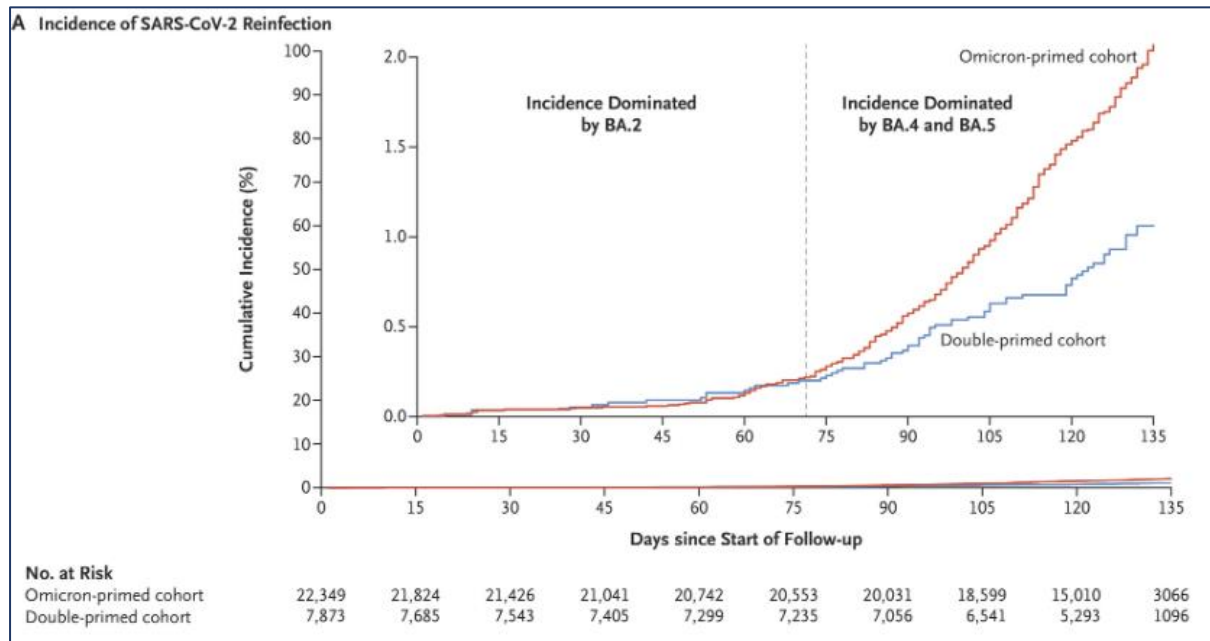
With Omicron variants emerging and then being usurped in what seems like a matter of weeks, the vaccine manufacturers are working hard to keep up, as noted above. But it does mean that longer term evidence of effectiveness of a bivalent vaccine targeted at a particular strain often emerges after that strain has been superseded.

So it is with the latest announcement by Moderna, that its bivalent BA.1 (remember that?) vaccine continues to be durable, showing higher neutralising antibody responses after 3 months in comparison with its original vaccine. Unfortunately again the announcement gives no more detail, but will be submitted for peer review publication in due course.

Finally the announcement notes that Moderna expects to be able to give initial results of its BA.4 /BA.5 bivalent vaccines later this year, as the company continues to respond to more recent strains.

Immune Imprinting and Protection against Repeat Reinfection with SARS-CoV-2

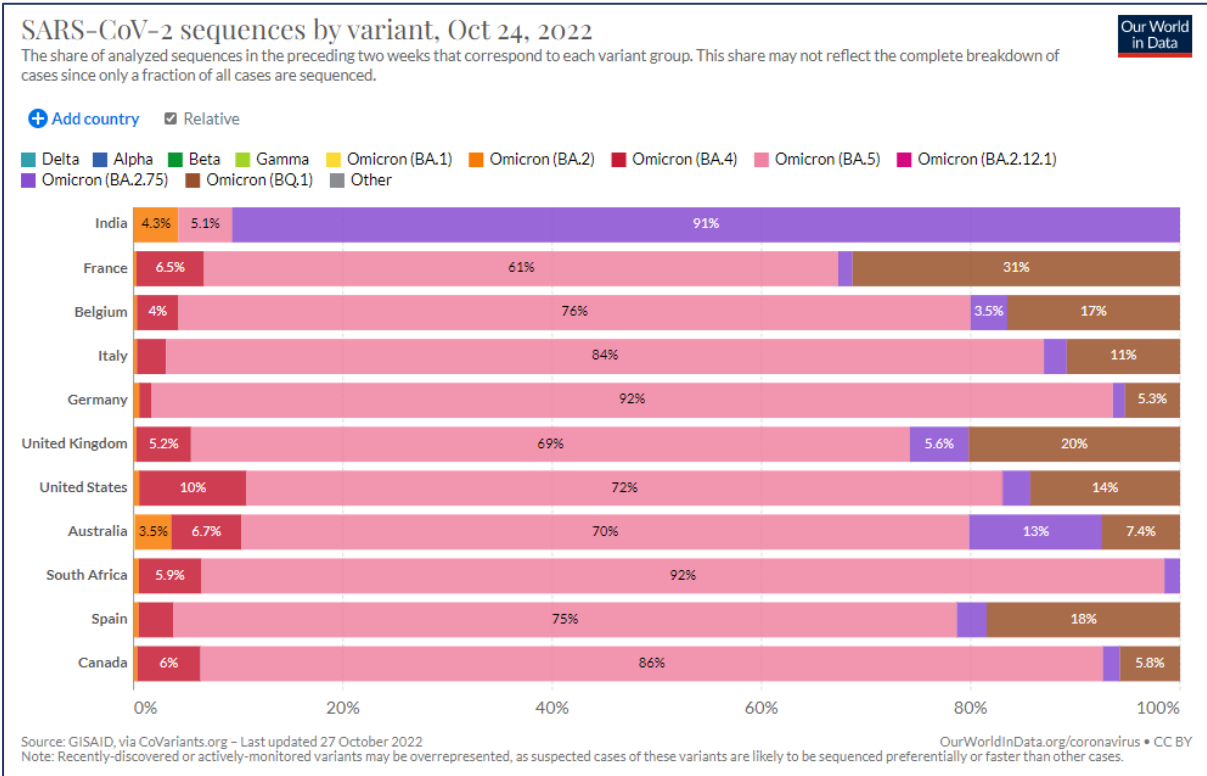
Previous studies have suggested that immune response to Omicron subvariants could be compromised by immune imprinting among people who had a previous infection with the original virus or Alpha variant. A new study from Qatar ([link](#)) has found that this is not the case and that those who were infected by both an older variant and Omicron (double-primed) had additional protection against reinfection compared with those who were previously infected only once with Omicron. This suggests that those previously infected will continue to be protected against future variants.



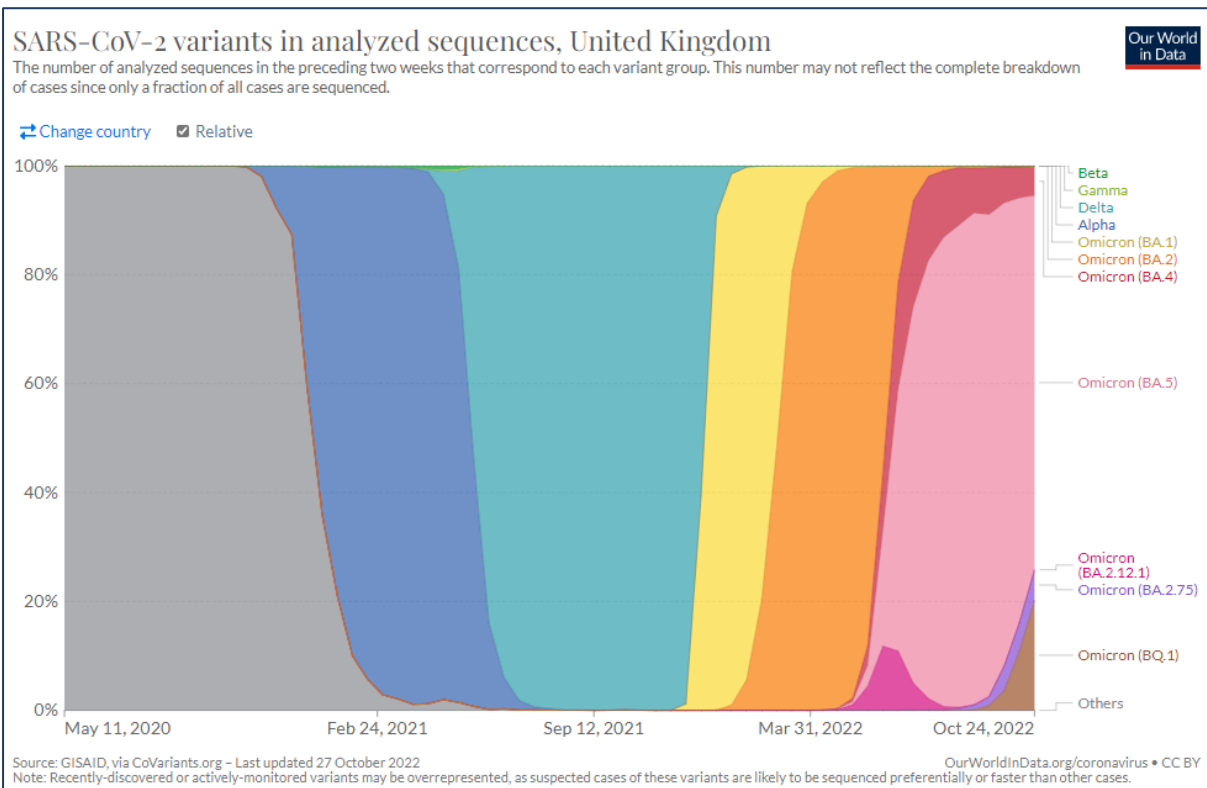
Variants

According to the World Health Organisation, over 300 sublineages of Omicron are currently circulating globally. ([link](#))

GISAID data is captured by Our World in Data ([link](#)) and shows that BA.5 is still the dominant circulating variant. However it is being replaced largely by BQ.1, a descendant of BA.5, and to a lesser extent by BA.2.75.



If we look at a time series for the UK, it is clear that BQ.1 is gaining ground. [\(link\)](#)



A recombinant variant XBB, a combination of BA.2.10.1 and BA.2.75, has been responsible for a wave on infection but not severe disease in Singapore and is also known to be circulating in India. [\(link\)](#)

Note that countries may use targeted sequencing so the contribution of each variant may not necessarily reflect community prevalence.

A pre-print study ([link](#)) has found that BQ.1, BQ.1.1 and BA.2.75.2 pseudoviruses showed enhanced neutralisation resistance to sera from vaccinated healthcare workers and BA.1 and BA.5 wave hospital patients. The BQ.1 and BQ.1.1 subvariants showed enhanced fusogenicity (ability to penetrate cells, likely to lead to greater severity). BA.2.75.2 does not show enhanced fusogenicity.

Medical

Evusheld Available Privately – at a Price ([link](#))

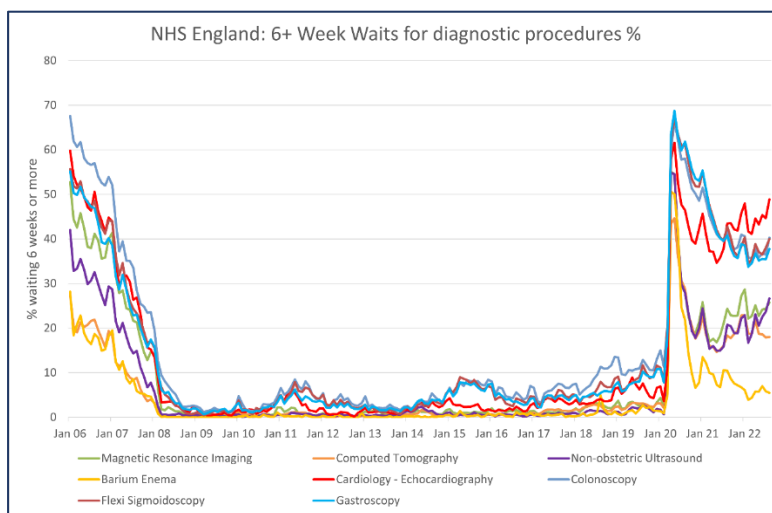
Despite being approved by the MHRA in March, Evusheld (tixagevimab/cilgavimab) has yet to be made available under the NHS, leading to much disquiet and criticism from groups supporting immunosuppressed individuals (and for whom vaccines are relatively ineffective), such as Blood Cancer UK.

In trials, Evusheld was found to reduce the risk of symptomatic COVID by 77%, with a single dose lasting for at least six months. These trials predated Omicron, however, and there is some evidence ([link](#)) that it is less effective against the more recent strains, such as BA.4 and BA.5.

The manufacturer, AstraZeneca, has now decided to make the drug available privately, although individuals will need to get a prescription and access it through private hospitals, insurers or healthcare providers. The cost for a single course will be at least £1,200, that being the price that AZ will charge the private provider, on top of which will be the provider's charge.

NHS England waiting lists near 7.5 million

The latest referral-to-treatment (RTT) waiting list data released in mid-October ([link](#)) notes 7 million patients on the English waiting list at the end of August. The current strategy is to focus on those with the longest wait to treatment, in particular those that have been waiting two years or more. As capacity remains below pre-pandemic levels and is insufficient to meet current demand, this means that overall waiting times are continuing to increase, and particularly the initial wait to diagnosis.



The chart shows how waiting times for diagnostic procedures improved dramatically from 2006 to 2010, so that no more than 10% waited more than 6 weeks for most diagnostic procedures over the following decade.

Whilst waits for some diagnostic procedures have improved significantly since early in the pandemic, almost 50% of those requiring a cardiology ECG are having to wait 6 weeks or more.

Two months on, and it is likely that NHS England waiting lists are nearing 7.5 million patients, even before we enter the busiest time of the year for the NHS.

Long COVID

COVID in Scotland Study – first results [\(link\)](#)

The COVID in Scotland Study (CISS) has released its first results assessing the long-term impact of COVID-19 in the country. First set up in May 2021, CISS has tracked a cohort of 33,281 with laboratory-confirmed SARS-CoV-2 infections against a cohort of 62,957 who were never infected, linking 6-monthly questionnaires, hospital and death records.

The study found that 6% had not yet recovered, and that likelihood of not recovering was associated with age, female sex, deprivation, multimorbidity, respiratory disease and depression. In all, prior symptomatic infection was associated with 24 persistent symptoms, such as breathlessness, palpitations, chest pain and confusion. Reassuringly, asymptomatic infection was not associated with poor outcomes and vaccination was associated with reduced risk of key symptoms.

A key concern is the extent to which COVID leads to long-lasting impairments. The study found that those who had had COVID-19 were more likely to have (among other things) mobility problems, difficulty completing household chores, and difficulty working/studying than the never-infected controls. Odds ratios for these comparisons were generally in the range 1.5-2.1, depending on the type of model adopted (ie what potential cofounders were allowed for).

International study on the prevalence of Long COVID [\(link\)](#)

International meta-analysis carried out as part of the Global Burden of Disease study at the Institute of Health Metrics and Evaluation (IHME) investigated 1.2 million individuals across 22 countries with a prior symptomatic SARS-CoV-2 infection. This mammoth effort involved pooling data across 54 individual studies and 2 US electronic health record databases. The meta-analysis confirmed three Long COVID symptom clusters, being

- persistent fatigue with bodily pain
- cognitive problems and
- ongoing respiratory problems.

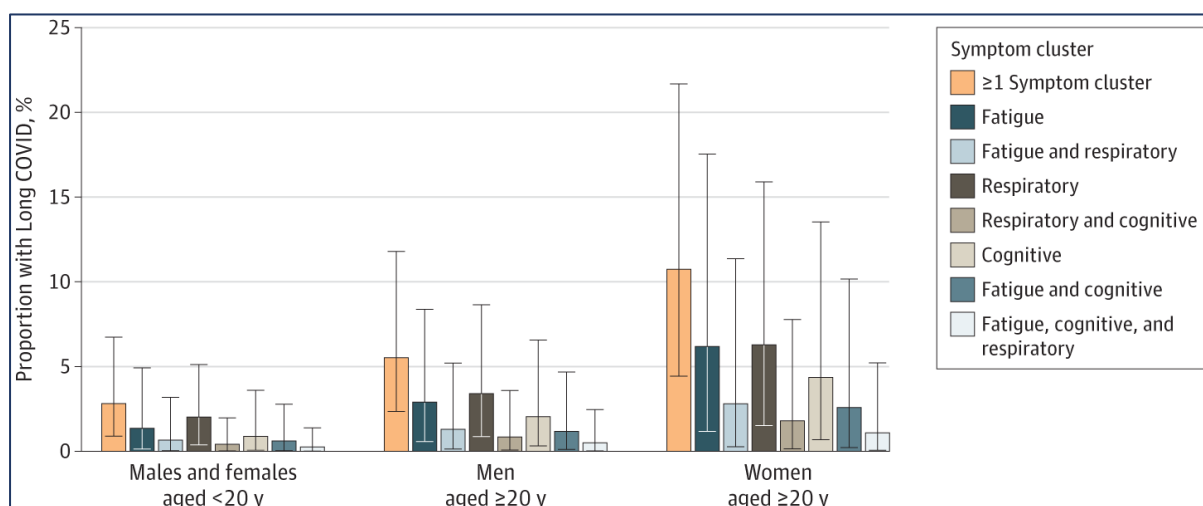


Table 3. Global Proportion of Individuals With at Least 1 of the 3 Long COVID Symptom Clusters

| | Proportion with Long COVID symptom clusters among survivors, % (95% UI) ^a | |
|--|--|----------------------------|
| | 3 mo after symptom onset | 12 mo after symptom onset |
| All individuals | 6.2 (2.4-13.3) | 0.9 (0.3-2.0) ^b |
| Both sexes aged <20 y ^c | 2.8 (0.9-7.0) | 0.3 (0.1-0.8) |
| Women aged ≥20 y | 10.6 (4.3-22.2) | 1.7 (0.7-3.6) |
| Men aged ≥20 y | 5.4 (2.2-11.7) | 0.8 (0.3-1.8) |
| Hospitalized | | |
| Needed care in a general hospital ward | 27.5 (12.1-47.8) | 11.1 (4.7-19.7) |
| Females | 34.8 (16.5-57.3) | 15.1 (5.8-29.7) |
| Males | 21.6 (8.9-40.3) | 8.2 (2.9-17.7) |
| Needed care in an ICU | 43.1 (22.6-65.2) | 20.5 (9.8-32.9) |
| Females | 51.9 (29.7-73.6) | 26.6 (11.5-47.8) |
| Males | 35.8 (17.1-58.1) | 15.7 (6.0-31.9) |
| Not hospitalized | | |
| All individuals | 5.7 (1.9-13.1) | 0.7 (0.2-1.5) |
| Both sexes aged <20 y ^c | 2.7 (0.8-6.7) | 0.3 (0-0.8) |
| Women aged ≥20 y | 9.9 (3.4-21.2) | 1.3 (0.3-3.4) |
| Men aged ≥20 y | 4.8 (1.5-11.3) | 0.6 (0.1-1.5) |

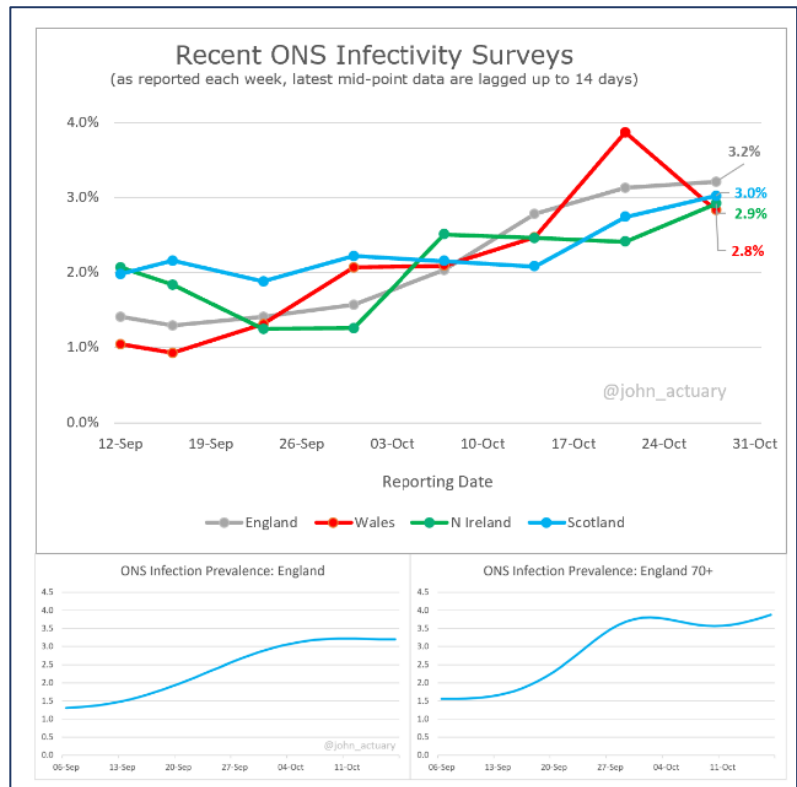
The meta-analysis estimated that 6.2% of those who survived the initial impact of COVID-19 were still experiencing symptoms from at least one of these three clusters after 3 months, but that this proportion fell to 0.9% 12 months after infection. Women were twice as likely to experience symptoms as men. Further, those who were hospitalised following infection were 10 times more likely to experience long-term symptoms than those that had not required treatment in hospital.

Data

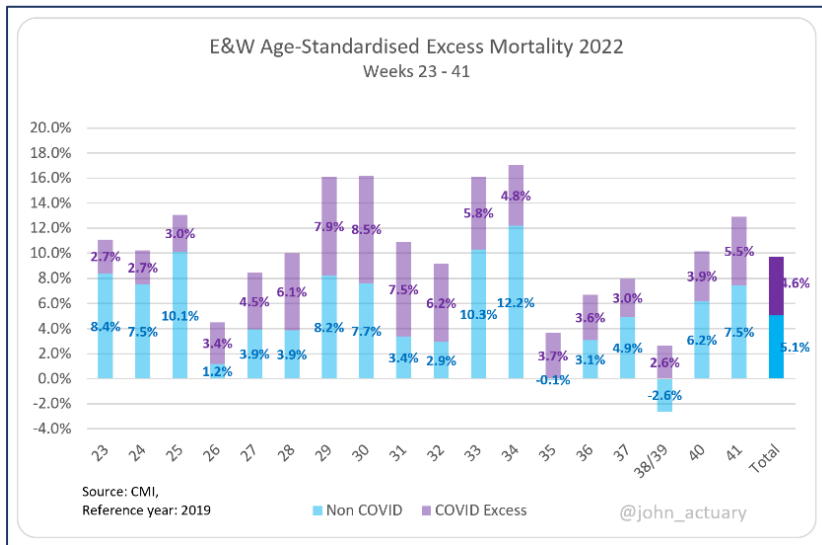
ONS Infection Study ([link](#))

The latest results from the weekly infection prevalence survey shows that levels are levelling off in England at just over 3%, but still appear to be increasing in the three devolved administrations (discounting last week's figure for Wales, which appears to have been excessively high).

Unfortunately the picture in England for the oldest age group is not as clear, with signs that prevalence, already considerably higher than the overall picture at around 3.8%, could be trending upwards again.



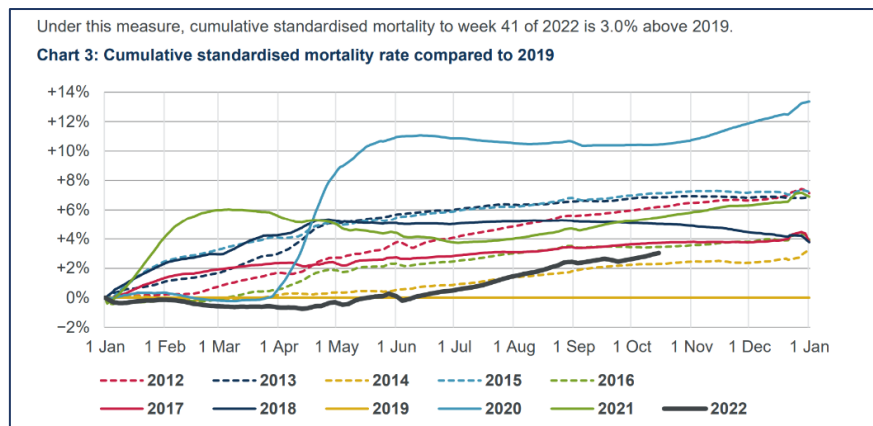
Excess Mortality Remains High [\(link\)](#)



Last month we reported that excess mortality over the summer period has been exceptionally high, even when COVID related deaths are taken into consideration.

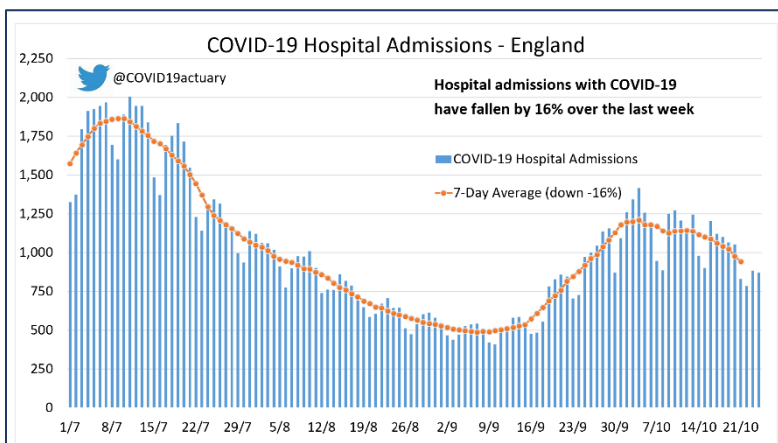
The last four weeks has seen a continuation of this trend, albeit that the first two weeks were distorted by the additional bank holiday for the Queen’s funeral (we’ve grouped these together in the underlying graph).

With COVID-related deaths also on an upward trend in recent weeks, consistent with the increase in prevalence reported above, we’re again seeing weekly excesses above 10%.



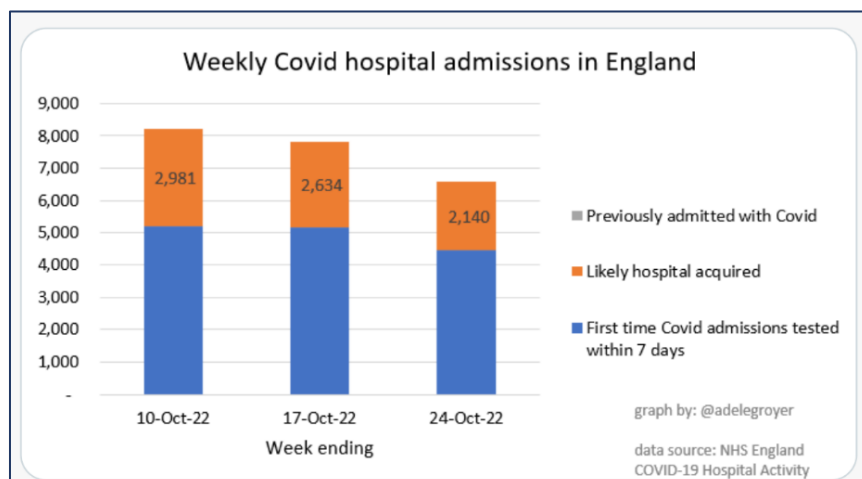
Thus the overall cumulative excess for the year, as reported weekly by the CMI [\(link\)](#), continues to rise, and is currently on a trajectory to be at around 5% by the year end. That level would mean that the last three years have seen a cumulative excess of around 25% of one full year’s mortality, a remarkable and sobering statistic.

Hospital Statistics



After the rapid rise during the second half of September, hospital admissions from COVID peaked around the start of October and have gradually declined since then. This can be seen from the chart below, which our group account (@COVID19Actuary) continues to publish on Twitter, every Thursday.

In the same way that hospital acquired infections (HAI) rose rapidly and was one of the key factors in the overall increase, they have now fallen quickly, and appear equally important in explaining the fall.



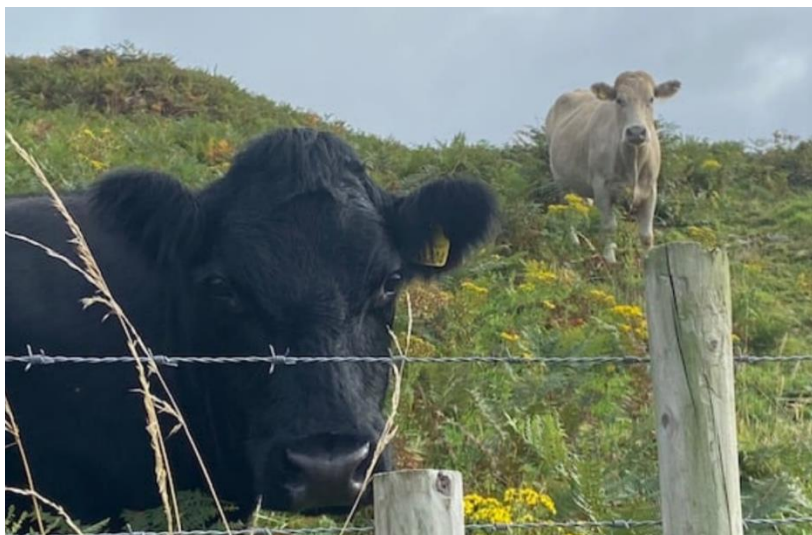
It is hard not to draw a link with the instruction to hospitals to withdraw non-pharmaceutical interventions at the start of September, and the reversal of that policy after HAIs soared.

And Finally ...

Burp and Fart Tax Brings Protests in New Zealand [\(link\)](#)

Actuaries take a close interest in climate change, which gives us an excuse to bring you this intriguing headline, regarding an innovative way to try and reduce the emission of agricultural greenhouse gases.

With methane emissions from cattle and sheep being regarded as a important contributor to global warming, the tax introduced by the New Zealand government is one way to try to reduce the country's carbon footprint, although it has incurred the wrath of the farming industry, with tractors blocking streets in many cities.



We're not quite sure though as to the method of measuring the methane output of each animal, and whether individual metering is envisaged at either end. But meanwhile we give Premier Jacinda Arden a pat on the back for her efforts to reduce the effect of climate change.

28 October 2022