

# John Dee, His Almanac

24th October 2020

## *A Tale Of Two Pandemics*

A number of folk now seem to be cottoning-on to the fact that the 'second wave' isn't doing what it says on the tin. The numbers are there for all to see over at [GOV.UK](https://gov.uk) but most find this sort of numerical digging rather confusing. I have thus produced this little tray bake with a touch of icing. I have taken the first sixteen days of April, when the NHS was in the thick of things, and have compared five key statistics to the first sixteen days of September, when we are all supposed to be in the thick of it once more.

The icing is that column I have labelled 'factor', from which we may deduce that back in the first wave we suffered 14.4x the number of admissions, 21.2x the number of beds assigned to COVID-19 patients and 70.8x the number of deaths for the same sixteen day peak wave period.

Comparing cases detected isn't so straightforward because we have to account for the differing numbers of tests processed. For simplicity what I have done is standardise the data at 250k tests, which enables us to see that 20.7x more cases were detected back in the first wave. These are substantial differences by any standards yet the government hasn't revised policies accordingly - it's worth asking why.

### A Tale Of Two Pandemics

|                                                                                         | First Wave<br>1st - 16th April | Second Wave<br>1st - 16th September | Factor |
|-----------------------------------------------------------------------------------------|--------------------------------|-------------------------------------|--------|
| Tests Processed                                                                         | 245,408                        | 3,452,725                           |        |
| Cases Detected                                                                          | 73,259                         | 49,767                              |        |
| Hospital Admissions                                                                     | 42,222                         | 2,942                               | 14.4   |
| Hospital Beds                                                                           | 286,226                        | 13,493                              | 21.2   |
| Deaths                                                                                  | 14,509                         | 205                                 | 70.8   |
| Source: <a href="https://coronavirus.data.gov.uk/">https://coronavirus.data.gov.uk/</a> |                                |                                     |        |

|                                     | First Wave<br>1st - 16th April | Second Wave<br>1st - 16th September | Factor |
|-------------------------------------|--------------------------------|-------------------------------------|--------|
| Tests Processed                     | 250,000                        | 250,000                             |        |
| Cases Detected                      | 74,630                         | 3,603                               | 20.7   |
| Case Detection Rate (per 100 tests) | 29.9                           | 1.4                                 |        |
| Standardised to 250,000 tests       |                                |                                     |        |

## *False Positive Scandal*

I wanted something special to announce in response to the government's diabolical broadcast on 1st October and felt exposure of the diagnostic fallacy inherent in the RT-PCR test, upon which all policy hangs, presented in one simple slide would do the job nicely. Here it is...

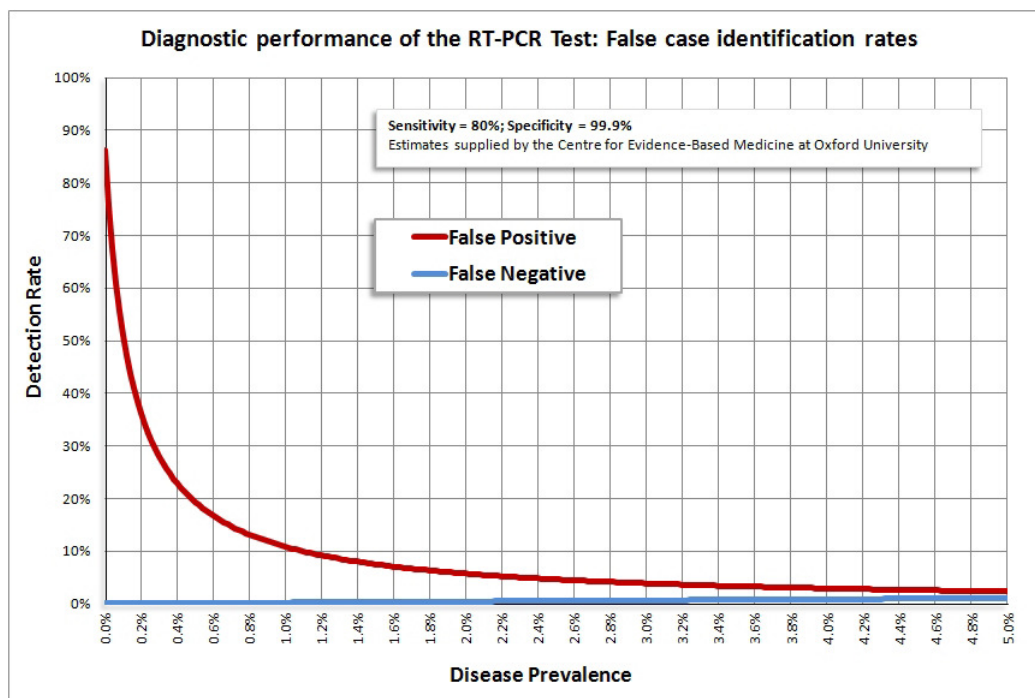
I have taken estimates for test sensitivity and specificity from the Centre for Evidence-Based Medicine at Oxford University and calculated both the false positive and false negative detection rates over a range of disease prevalence (percentage of the population who are genuinely infected).

We can see that the false negative reporting rate crawls along the bottom and only starts to feature as a matter of concern when disease prevalence is high. In the peak of a pandemic, therefore, false negative results will lead to release of infected people back into the community and the only way this can be avoided is to undertake additional testing to verify RT-PCR results. To my knowledge this was never mandated at the national or even regional level by HMG.

In stark contrast the false positive reporting rate rockets exponentially when disease prevalence is low. Toward the tail end of a pandemic, therefore, false positive results will lead to needless incarceration of individuals, families and whole communities. This very real and alarming situation is precisely where we are now. Even more alarming is the fact that HMG and its senior advisors are completely ignoring this simple diagnostic fact; I cannot imagine for one second that they have not been made aware of this.

If disease prevalence in the UK is currently running at 0.1% (1 in every 1,000 people) then the false positive rate for the RT-PCR test will be 55.5%, i.e. just over half of the new cases declared will have been declared in error. If disease prevalence in the UK is down at 0.01% (1 in every 10,000 people) then the false positive rate for the RT-PCR test will be an incredible 92.6%.

We thus find ourselves in an extraordinary situation where many of the new cases being declared will have been declared in error, and many of those currently being locked away should be walking free. This is why our hospitals are almost empty and the death rate minimal.



## New Imperial Study

Back on 1st October the DHSC announced the publication of a new study into COVID-19 prevalence by Imperial College, assisted by MORI. Yes, exactly, that Imperial College. I decided to read the pre-print summary and discovered they've used RT-PCR swab test results to estimate this.

Oh dear.

An analogy is to ask a thief if they are innocent instead of the jury; in this case the jury is benchmark serological testing. I did write something rather strong in response, being the first to reply. A couple hours later only 2 comments were showing under mine. I checked a second time to discover they'd discreetly removed my post, and comments were now building, so I added a more genteel paragraph.

On a related note ONS, in conjunction with Oxford University, are conducting an ongoing project to estimate prevalence and a few other things. Although they claim this is the real McCoy, and based on blood tests, if you study their methodology you'll see blood tests are given only to those over 16 who have already taken part in a previous COVID-19 study.

Oh dear.

They also decided to give priority to 'hotspots' - no bias there, then! But this isn't the worst of it, the broad-scale test they are using for the majority of their sample is, yep, you've guessed it - the RT-PCR test. To be quite frank this is a load of old swabs.

## Know Thy Prevalence

Prevalence studies using blood samples (serological testing) tell us where the virus has *\*been\**, not where it is now: our blood stores our viral history. It takes 3 - 4 weeks for the body to develop sufficient antibodies to count in a laboratory and by that time the infectious stage has long passed. As soon as your body starts making antibodies you are no longer infectious even though you are infected.



Folk may say, "but uncle Alfred was ill with the virus for 10 weeks". No he wasn't, he was ill with the virus for a few days, after which post-viral symptoms kicked-in including, in some uncles, their own bodies attacking them (cytokine storm), after which they then had to recover \*and\* deal with their pharmacological load.

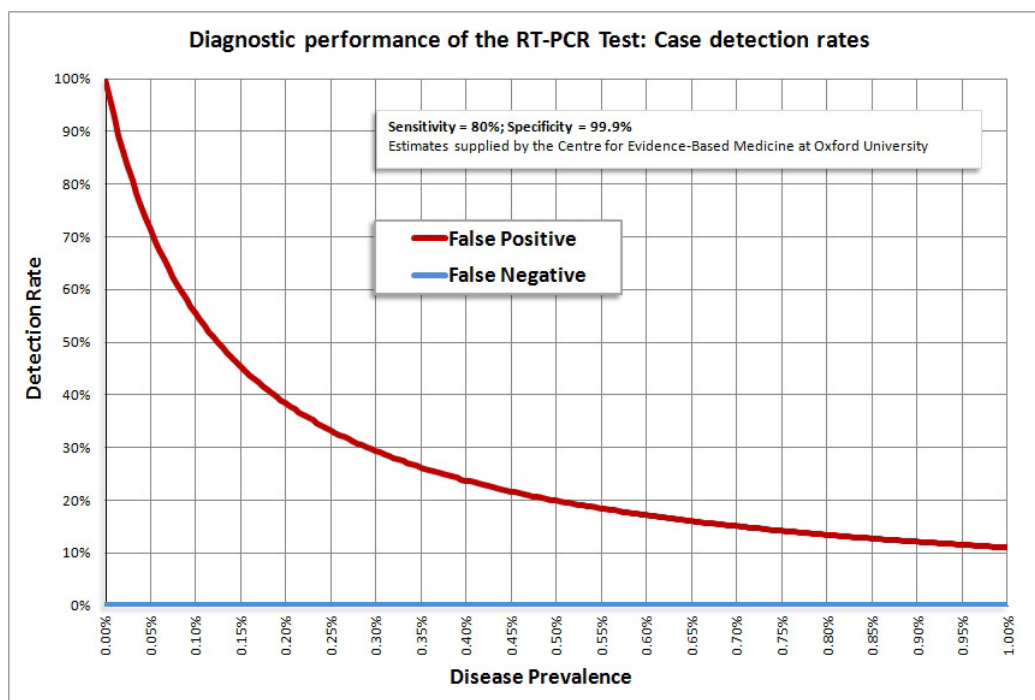
A high level of prevalence would be an encouraging finding in that it would reveal many more folk were infected across the UK than we initially estimated and this would mean the virus is far less dangerous than first thought. However, a high level of prevalence would mean those cunning folks at DHSC would be able to defeat the spectre now looming large that is the false positive issue. The way they'd do this is to pretend serological studies tell us what the actual prevalence of infectious disease is right now today, ignoring the fact that such studies reveal our viral \*history\*.

If, by way of example, they can show prevalence is up at 0.5% (1 in 200 genuinely infected folk ) then the false positive reporting rate drops to a politically appealing 20%. If prevalence is down at 0.1% (1 in 1,000) then the false positive reporting rate rises to a politically fiendish 56%. Heaven forbid prevalence is down at 0.01% (1 in 10,000) for the false positive reporting rate rises to a government-crushing 93%.

I am going to guess this is why we are seeing valiant attempts by the ONS, Oxford, Imperial and MORI to hastily publish a raft of perfectly porky prevalence percentages. We should note it was Ferguson's mob that has come to the rescue of political alarmism once more.

The grass roots answer to all this should have come with the pillar 3 test results (serological testing of the wider population) but these have not been released as yet even though we are several months down the line. Instead, we are treated to reports by those with invested interests aimed at making the public believe the virus is here today in vast and highly infectious quantities, and that false positives are irrelevant.

There are some GPs out there who don't understand this but my face is too sore from face-palming to continue face-palming. I've attached a graph revealing the diagnostic performance of the RT-PCR test for a range of prevalence from 0% - 1%. Current studies are suggesting 0.2% or thereabouts but these are going to be grossly inflated due to the methodology used.



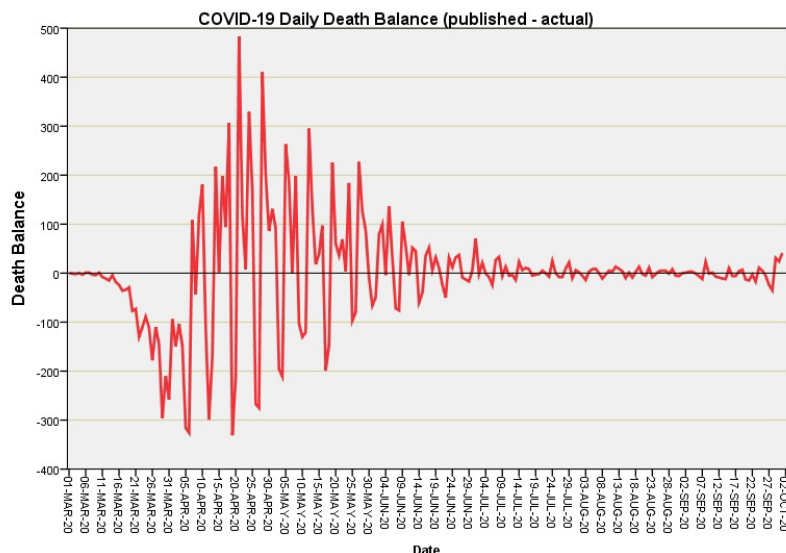
## ***Skeletons In The Closet I***

A while back I rumbled one of the games HMG are playing with the death figures that are released to the public on a daily basis. There are two sets of numbers, the first being the death tally according to the date of death on the certificate and the second being a curious tally the DHSC invented called 'published deaths'. In a nutshell they are strategically holding some numbers back which enables them to declare an enormous published total every now and then. Anybody can discover this for themselves by analysing the number of daily deaths occurring according to the date of death on the death certificate and comparing this count with the number of deaths published in DHSC daily reports. When this is done we get something I am calling the 'Daily Death Balance' which is simply the DHSC published death count minus the actual certified death count.

The attached slide reveals how this has bounced around since 1st March. A positive balance reveals just how much the DHSC published count exceeds the actual death count; such that, on 21st April, the DHSC announced a record 483 more deaths than had actually died on that day.

That's a pretty big difference. In order to generate these excessive counts the DHSC holds back counts on some days, giving rise to a negative balance. The record number of deaths held back occurred on 6th April when they held back 326 deaths for that day. Note the substantial negative balance at the start of this graph – they intended to play this game from the very beginning.

There is absolutely no need for this since all the DHSC had to do was announce the actual certified number of deaths for each day 2 – 3 days in arrears to allow time for administrative delays and various suits to sign the numbers off. Instead, they decided to play a diabolical game with the public who thought they were hearing the truth every morning. Those with eagle eyes will see that little kink at the end of September which means they are continuing with this charade even though counts are minimal. That little kink was timed to coincide with Boris' speech to the nation.



Source: <https://coronavirus.data.gov.uk/deaths>

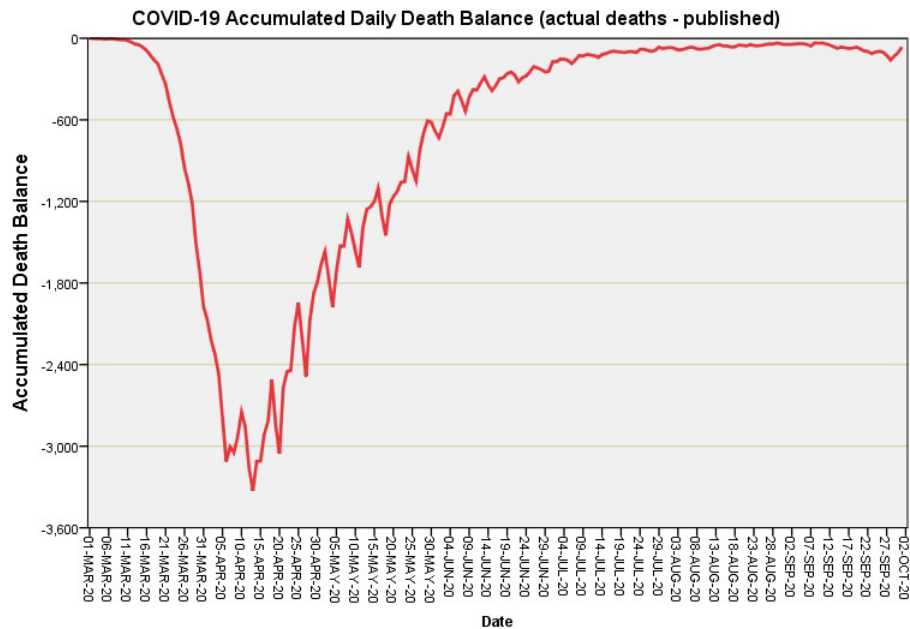
## ***Skeletons In The Closet II***

In the previous post we got to see the extent of the daily numbers game the DHSC are playing with the death count by holding some deaths back in order to report inflated figures at strategic moments. They could easily announce actual deaths by certified death date after a reasonable 2 – 3 day delay to allow for administration but instead have decided to concoct a fabricated tally called 'published deaths' with which to scare the public.

What I am going to do in this post is to take the rather wiggly daily death balance of the previous slide and simply calculate the running total. This will tell us just how many deaths were held back in total on a historical basis i.e. how big their 'death store' actually got. The answer, as you can see for yourselves, is truly astonishing. Back in early April the DHSC's 'death store' reached a staggering 3,000 under-reported deaths.

So where did these deaths go? Well, they went into over-inflated published death statistics released between April and June, thus serving to prolong the fear. As we can see, come August they had more or less caught up with themselves, but not quite. On 1st August they had forgotten to report 68 deaths, and on 1st September they had forgotten to report 46 deaths. Clearly trying to make the most of the situation, they managed to bump their death store up to 106 as at 30th September.

Now here's how ridiculous this all is. Any member of public wanting to know the truth can go to <https://coronavirus.data.gov.uk/deaths> and simply pull down the data entitled 'Deaths within 28 days of positive test by date of death' – unfortunately the majority are going to be shaking in front of the TV as the published death tally is announced.

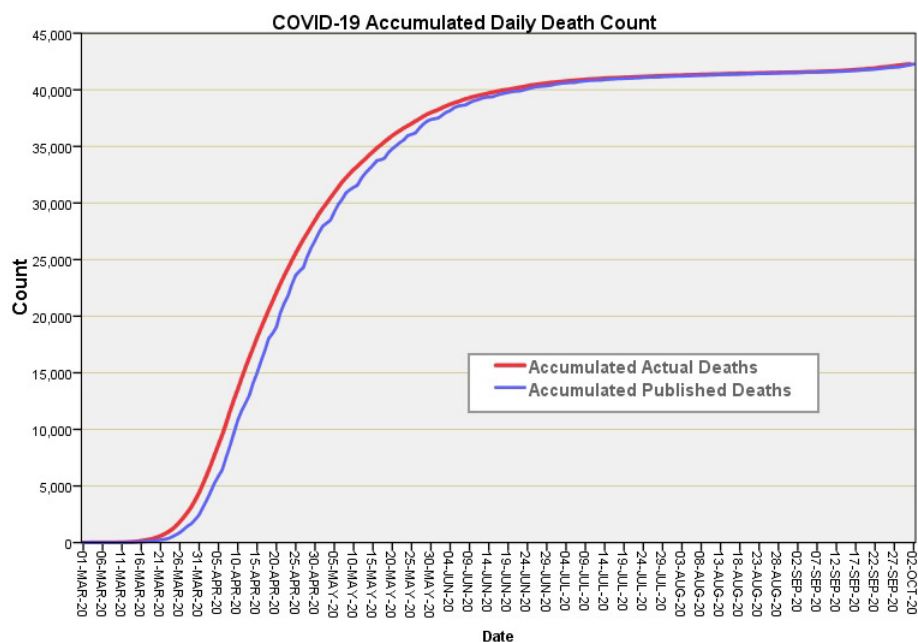


Source: <https://coronavirus.data.gov.uk/deaths>

### *Skeletons In The Closet III*

A quick slide I knocked-up for those who want to get their head around this issue and find my 'death balance' and 'death store' a bit of a mind-mangler. What I've done here is simply calculate the running total for DHSC published death figures and compare this with the running total for actual death figures based upon the death certificate. You can see that the red line (actual death count) sits on top of the blue line (DHSC published count) which means more deaths were occurring than the DHSC were reporting right up until around July.

So what do you do with all these under-reported deaths during the peak of the pandemic? Well, you start reporting them much later, thereby extending the 'problem' in the eyes of the public. This was done from the outset.



Source: <https://coronavirus.data.gov.uk/deaths>

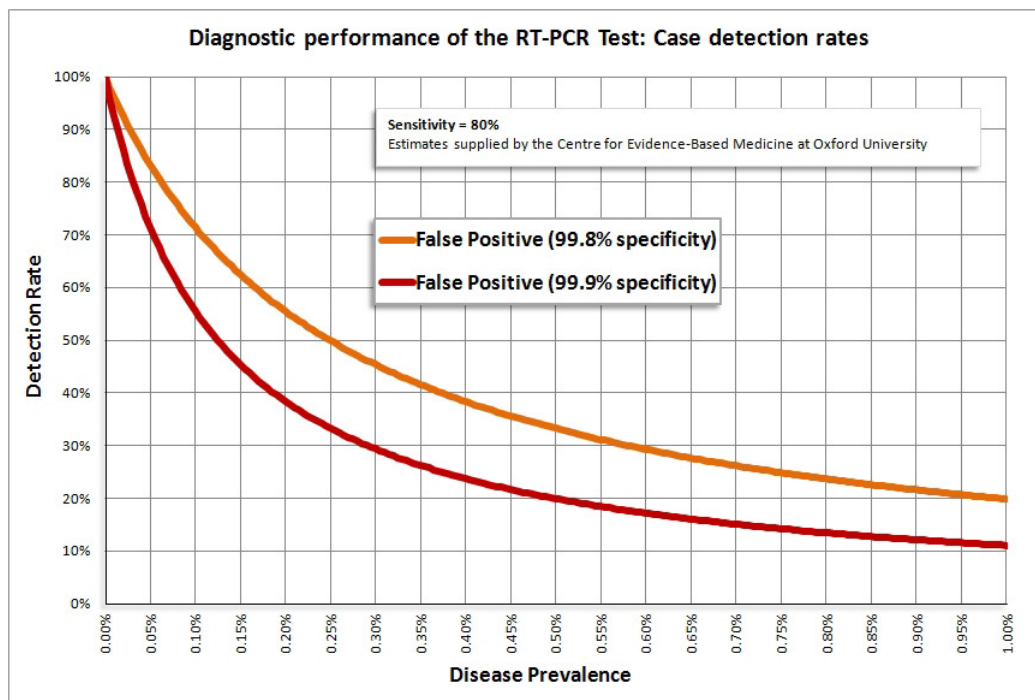
## Test Analysis Project (Specificity)

The diagnostic limitations of the RT-PCR test, at an estimated 80% sensitivity and 99.9% specificity, indicate that 55% of test results are going to be false positives if the prevalence of SARS-COV-2 within the population is 0.1% (1 in 1,000), rising to an astonishing 93% if the prevalence of SARS-COV-2 within the population drops to 0.01% (1 in 10,000). Even if prevalence is as high as 0.2% (1 in 500) as some are claiming then diagnostic limitations force a false positive reporting rate of 38%. This isn't where the problem ends for operational performance of this critical test has still to be measured. Let me explain what I mean by operational performance...

Up to now estimates for RT-PCR test sensitivity and specificity for SARS-COV-2 have come from studies of previous outbreaks, theoretical modelling and laboratory assay. Whilst these provide a good starting point this is not the same as measuring performance of the test in a real life setting with real life swabs being handled by real life technicians. We have no idea what the operational sensitivity and specificity for the RT-PCR test for SARS-COV-2 actually is. With this in mind I have produced a slide revealing what would happen if real life specificity dropped just 0.1% from the estimated 99.9% to 99.8%.

With a disease prevalence of 0.2% (1 in 500) at a specificity of 99.9% we have discovered that the false positive reporting rate will be 38%. At a specificity of 99.8% the false positive reporting rate will rise to a troubling 56%. The operational performance of the RT-PCR test may well lie below 99.9% and some have suggested it may be as low as 95%, in which case no less than 97% of test results will be false positives. Anybody who is not shocked by this doesn't understand the problem.

In a nutshell, the country has been under lock and key because HMG and its senior advisors haven't bothered to consider test performance; either that or they've decided to deliberately ignore this fundamental issue and pursue draconian policies regardless. Anybody with a drop of common must realise the government's response is no longer about the virus and is nothing to do with the health of the nation.



## A Diagnostic Fallacy

Protocol dictates that persons being admitted to hospital are PCR swab tested for SARS-COV-2. Instead of ordering this test let us suppose medics order PCR testing for Rhinovirus, this being the predominant virus that causes the common cold. As we move toward the seasonal winter death peak hospital admissions for COPD and other respiratory conditions will rise as they always have done, and deaths will invariably follow. Because we've ordered a test for Rhinovirus, we'll see an apparent rise in deaths for those testing positive for the common cold. The absurdity of the common cold killing folk enables us to see a logical fallacy. The same fallacy lies within testing for SARS-COV-2 yet, because this virus can be deadly, we tend to overlook this fact.

Let me now muddy the water. Suppose a COPD/heart failure patient managed to survive COVID-19 back in April, and had fully recovered by May, but their heart condition started to deteriorate in August, leading to admission and inevitable death in October. This person would still test positive for SARS-COV-2 on admission and because of this they would count as a COVID-19 death. In counting them as such we have committed a diagnostic fallacy.

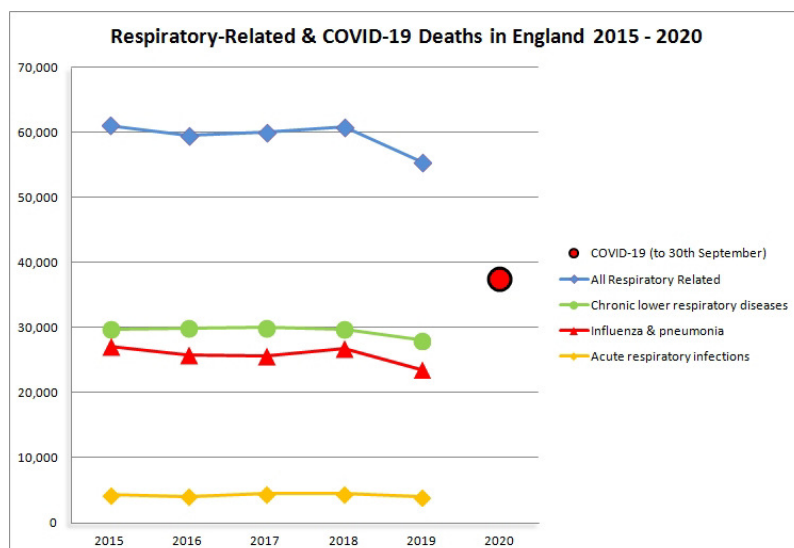
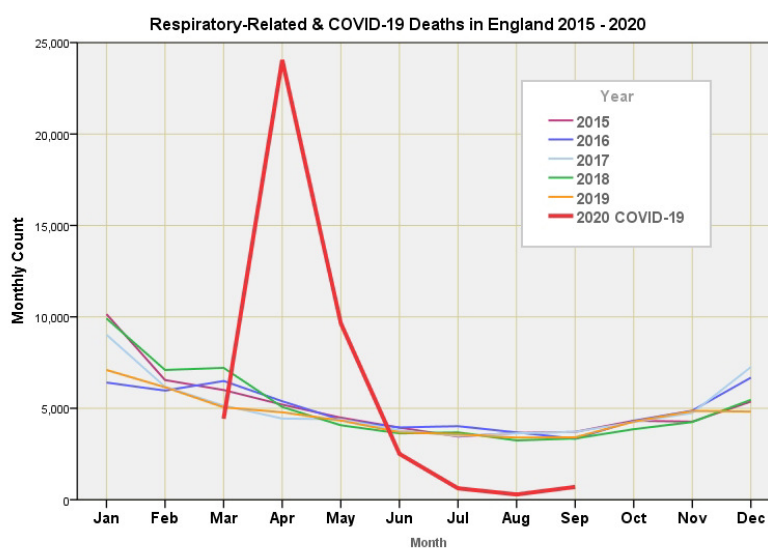
The problem is that the information chain is no longer dependent on clinical diagnosis proper, as it is with all other diseases, and relies solely on a test result. We may get a hint as to the size of the diagnostic problem when we consider that, of the 30,049 COVID-19 deaths reported for England as at 4pm on 30th September, only 1,406 can be attributed to SARS-COV-2 alone (4.7%).

## Historic Death Analysis (Respiratory)

I have been busy collecting data from [GOV.UK](https://gov.uk), ONS, WHO and UN to enable me to put the COVID-19 outbreak into context and start statistical modelling. I attach two slides that should be fairly self-explanatory. The first shows registered deaths by leading cause and I have chosen the three key series plus their annual sum over the last five complete years. Chronic lower respiratory diseases (e.g. COPD, asthma, emphysema) lead the way with a 5-year mean of 29,427 deaths per year, closely followed by influenza and pneumonia with a 5-year mean of 25,743 deaths per year, the total yielding a 5-year mean of 59,388 deaths per year.

COVID-19 deaths to 30th September, sitting at a total of 37,519 for England, now exceed leading individual respiratory causes but have yet to match the total death toll from all respiratory-related causes. This assumes they have been correctly certified and coded and I shall be examining the possibility of misdiagnosis: a sudden and explicable dip in these three leading causes would most certainly point to this.

The second slide reveals the very same data but plotted out so we may compare monthly mortality across the last five years. The COVID-19 peak utterly dominates this plot but then again it will be necessary to conduct analyses to ensure this is genuine and not an artefact of misdiagnosis and erroneous coding; if nobody is dying of COPD, emphysema and bacterial pneumonia anymore then it will be necessary to adjust the COVID-19 figures downwards. Statistical modelling will greatly assist in this process. Setting aside this tricky issue we now see that COVID-19 deaths are running well below the expected death toll for the normal range of respiratory conditions for June to September.



Data sources: <https://coronavirus.data.gov.uk/>; ONS Deaths by Leading Causes 2015 - 2019

## Death Due To Lockdown

Yesterday whilst analysing ONS data I came face-to-face with the terrible hidden cost of lockdown, this being a tremendous spike in the number of non-COVID deaths over and above that expected from the 5-year average. A colleague pointed me to an article in the Telegraph that was filed at 9pm on 29th July by Laura Donnelly and Sarah Knapton with the headline 'Lockdown has killed 21,000 people, data suggests'. Laura and Sarah were reporting on a study by economists and academics from Sheffield and Loughborough universities that suggested that more than 21,000 people have died as a result of lockdown measures that were introduced in March. I had seen this same spike for myself and proceeded to undertake my own estimate to verify their claim using the latest data.

The basic process is quite simple. Take the total number of registered deaths for England and Wales and subtract the number of COVID-19 certified deaths, then subtract the 5-year average to obtain excess deaths. A complexity arises when we come to compare 2020 with the previous 5 years for we find 2020 started with below average all cause deaths and so a small adjustment has to be made using pre-pandemic death rates.

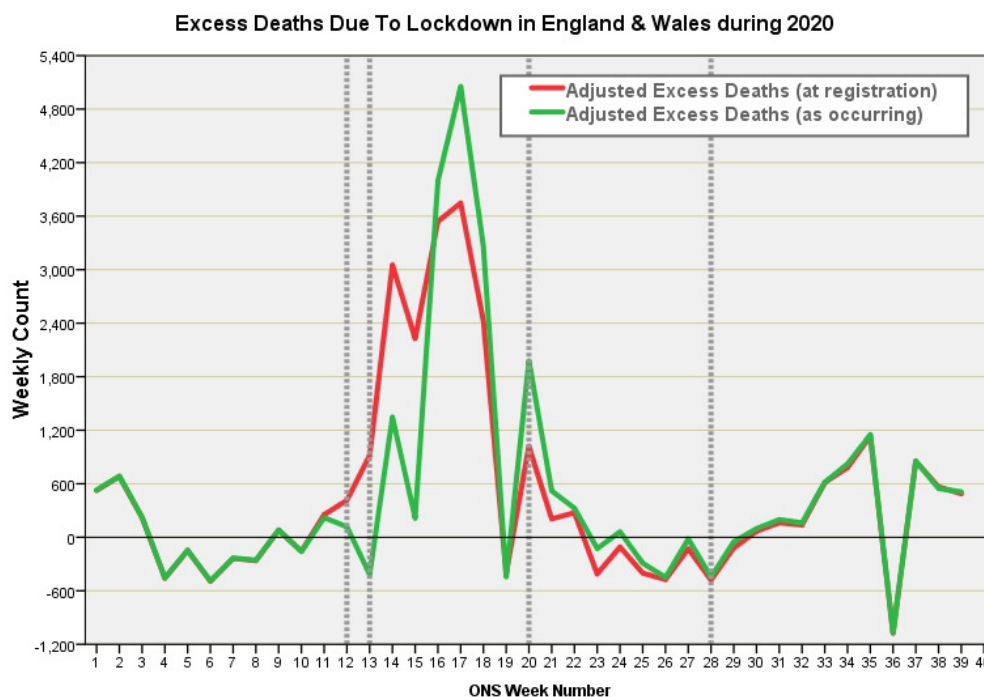
Another complexity is how the ONS go about counting weekly deaths due to COVID-19. Deaths are counted according to when they actually occur and according to registration date, there being a delay between the two. Under normal circumstances deaths are counted according to weekly registrations. Logically we should compare apples with apples (registration counts) but I decided to analyse both methods of counting just to be sure.

Key dates are important in this analysis and these were defined as follows:

- Social distancing encouraged on 16th March (week 12)
- Lockdown announced on 23rd March (week 13)
- Lifting plan announced on 10th May (week 20)
- Changes in measures announced 4th July (week 28)

I attach a slide that reveals estimated excess deaths due to lockdown week-by-week for both methods of counting COVID-19 death with the key pandemic phases marked to guide the eye. These are excess deaths occurring over and above that expected from the 5-year average for the corresponding week after COVID-19 deaths have been removed from the total.

People are going to ask how many excess deaths we can ascribe to lockdown and so the second slide provides totals by pandemic phase as well as the overall total. Going by death registration date we find an overall excess of 19,018 deaths for England and Wales, with the majority (15,506) occurring during weeks 13 to 19. It is worth noting the rise in excess deaths during weeks 28 to 39, after the government announced changes in measures on 4th July. To put this into context the total number of COVID-19 28-day deaths announced by DHSC for England and Wales for the same period sits at 39,160 registered deaths, the majority of which carry significant co-morbidities.



Source: Office for National Statistics. Week 12 - social distancing encouraged; week 13 - national lockdown; week 20 - lifting plan announced; week 28 - change in measures announced.



## Excess Deaths Due To Lockdown in England & Wales

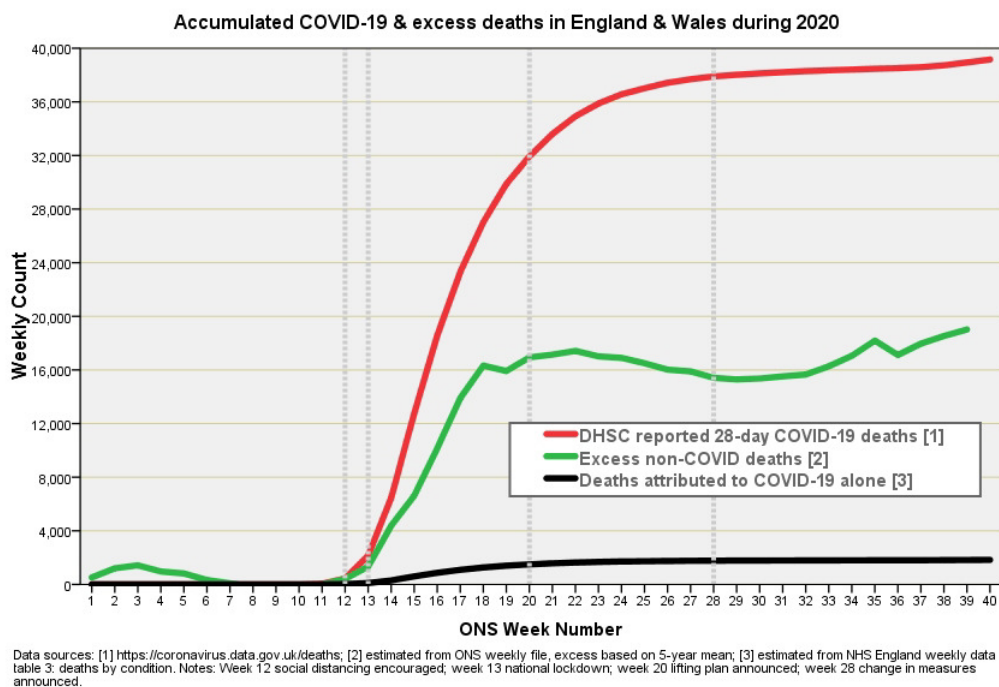
| Pandemic phase               | Week Range | Excess Deaths<br>(at registration) | Excess Deaths<br>(as occurring) |
|------------------------------|------------|------------------------------------|---------------------------------|
| Pre-pandemic                 | 1 - 11     | 0                                  | 0                               |
| Social distancing encouraged | 12         | 414                                | 118                             |
| Lockdown                     | 13 - 19    | 15,506                             | 13,005                          |
| Lifting plan announced       | 20 - 27    | -26                                | 1,996                           |
| Change in measures announced | 28 - 39    | 3,124                              | 3,394                           |
| <b>Total excess deaths</b>   |            | <b>19,018</b>                      | <b>18,513</b>                   |

Data Source: Office for National Statistics

## COVID-19 Excess Death Tracker

Lockdown comes with a terrible hidden cost, this being excess deaths over and above that which we should expect. 'Excess death' is a polite way of saying lockdown death. Boris Johnson states he must do what he must do to keep people safe but his government's policies are killing people, as you can plainly see.

There may come a time when government policy is killing more people than the virus for Boris Johnson has set a murderous machine in motion, the effects of which will likely be felt for the next 20 - 25 years, late diagnosis of neoplasms being but one example. I shall be updating this chart regularly.

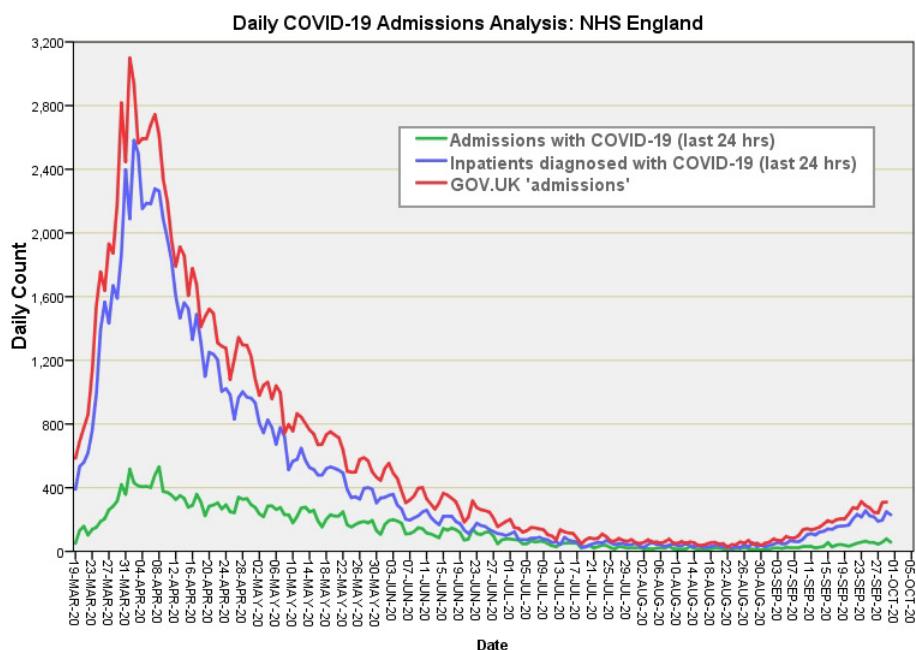


## Bed Occupancy Project (Admissions Analysis)

Herewith the first slide with the updated hospital activity data from NHS England. The red line is what HMG are calling an 'admission' but down in the data definitions on their coronavirus dashboard under a section called 'about' you will find the definition of an admission is an admission proper plus any inpatient who has tested positive.

This doesn't mean to say these inpatients are infectious or even carrying the virus since the RT-PCR test yields false positive results and cannot tell us anything about infection as a simple Yes/No test result. It should be obvious but I'll just point out that inpatients are in hospital for many reasons but protocols dictate they are tested, hence a routine hip operation will become a COVID 'case' and count as a COVID admission if they test positive. We should also note that anybody who was infected earlier in the year will still be testing positive, thus a fully recovered person popping in for routine minor surgery will be counted as a COVID admission. The admission statistics produced by HMG are thus clinically meaningless.

Now we understand the data a little better I shall point out that the recent upswing in 'admissions' (red line) is largely down to inpatients testing positive (blue line) and not admissions proper (green line). One more wrinkle in the fabric of understanding the numbers is the fact that re-admissions of the same case are multiply counted, thus a renal patient who was infected back in April for a short while and is now recovered will count as a COVID admission every time they go for dialysis. The same game applies to cancer patients going for radiotherapy and anybody else requiring regular medical care. NHS England are now releasing admissions data dating back to 1st July that removes multiple counting and I shall be presenting this in due course.



Source: <https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-hospital-activity/>

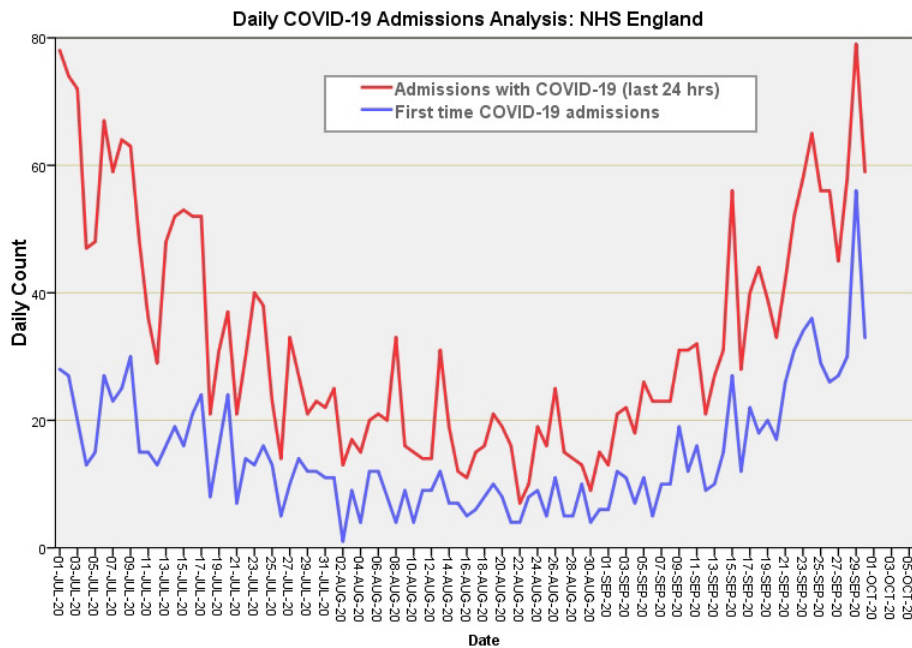
### ***Bed Occupancy Project (Multi-Admission Bias)***

In the previous post I mentioned HMG's hidden data wrinkle of counting multiple re-admissions of the same patient and treating these as separate cases. NHS England have fortunately come to the rescue by providing first time admission data from 1st July so we may more accurately assess what is actually going on rather than what HMG claim is going on. In the first slide below we get to see the impact of folk regularly returning for dialysis, radiotherapy, physiotherapy and all the rest, who have tested positive at some point.

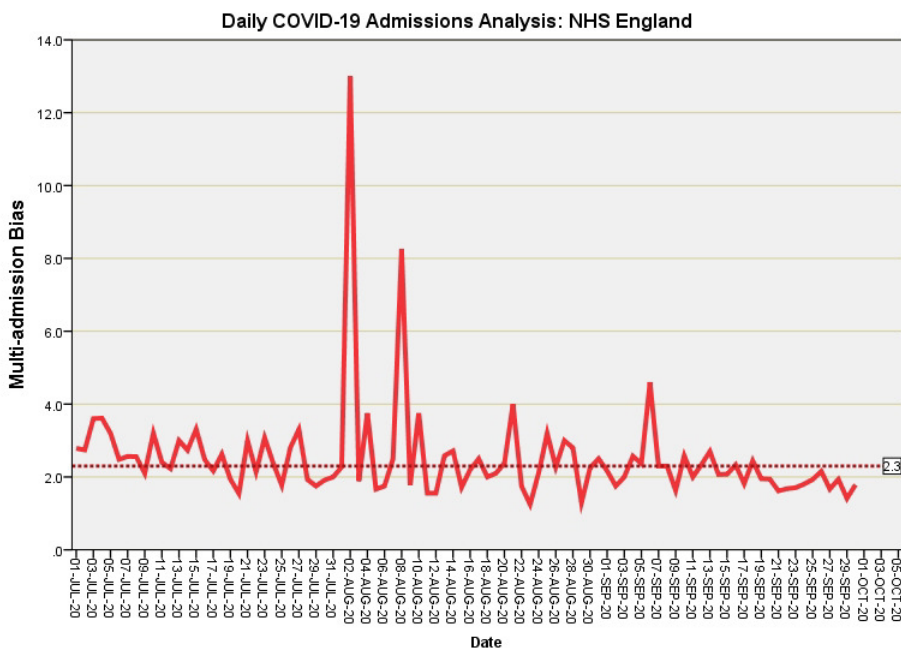
As I have stated many times before testing positive does not mean a person is infectious, symptomatic or even carrying the SARS-COV-2 virus (false positives) and that a person genuinely infected earlier in the year yet now fully recovered will continue to test positive. Clinically speaking, therefore, a simple Yes/No PCR positive test result is meaningless without a diagnosis by a physician and/or serological testing. Please bear all this in mind when looking at this first slide because none of these admissions may have any epidemiological relevance.

For those who are already getting out their ruler and trying to estimate just how many re-admissions are being counted as admissions I have derived an indicator I'm calling Multi-Admission Bias (MAB), this being the number of reported admissions divided by the number of first time admissions. This is presented in the second slide. Aside from a couple of extraordinary peaks we see that MAB is trundling along at between a factor of 2.0 and 4.0, meaning admissions figures announced by HMG are being doubled or quadrupled through failure to account for re-admission.

This is quite extraordinary but no longer a surprise, for I have yet to see a single truly honest figure reported to the public. Incidentally, the median MAB for this series is 2.3, so if we halve admission figures issued by HMG we'll get closer to the truth but even then admissions \*with\* COVID are not admissions \*for\* COVID and thus these figures are not necessarily an indication of the general level of infection or sickness across NHS England, as already outlined. Incredibly, junior staff working in hospitals don't appreciate that admissions \*with\* is not the same as \*for\*. This is not altogether surprising because they simply have their head down doing a rather tough job.



Source: <https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-hospital-activity/>



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## GOALPOSTS!

Just updating my database and came across this little explanatory note. The COVID admissions and new case goalposts have been moved to include data from the independent sector Mental Health Learning Disability and Autism (IS MHLDA) providers. Next up they'll be counting admissions to B&Bs. <https://www.england.nhs.uk/.../covid-19-hospital-activity/>

### England

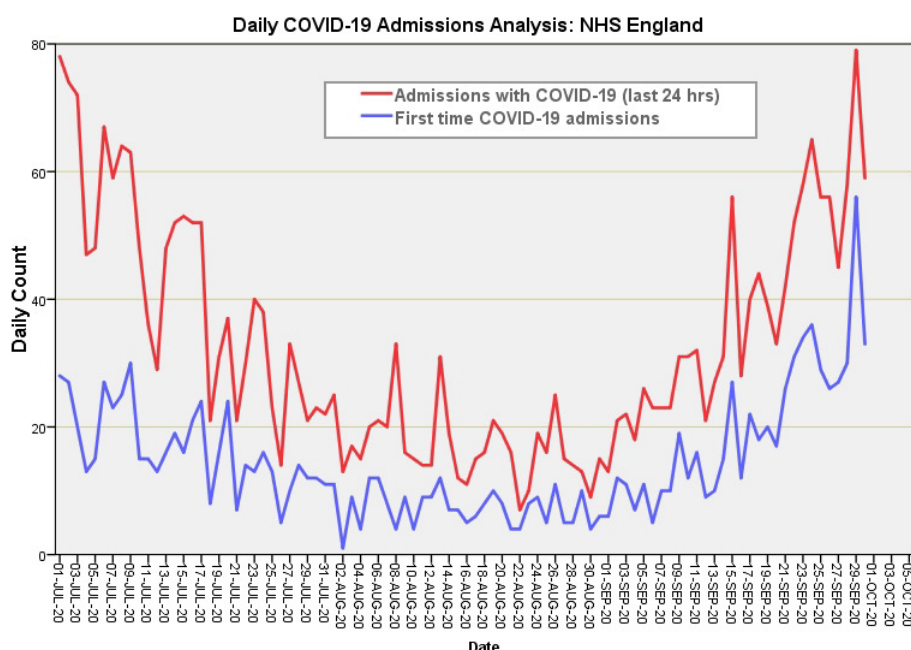
England data include people admitted to hospital who tested positive for COVID-19 in the 14 days prior to admission, and those who tested positive in hospital after admission. Inpatients diagnosed with COVID-19 after admission are reported as being admitted on the day prior to their diagnosis. Admissions to all NHS acute hospitals and mental health and learning disability trusts, as well as independent service providers commissioned by the NHS are included. Data are reported daily by trusts to NHS

## RECYCLING CASES

This morning I have discovered that NHS England have updated their time series file Covid-Publication-08-10-2020v2.xlsx to Covid-Publication-08-10-2020v3.xlsx. These files provide detailed hospital activity data and are invaluable in unpicking the narrative. I couldn't see any difference between them in terms of figures provided until I noticed one small change - they have quietly removed the tab marked 'Admissions First'. Let me type out the contents of cell B11 from within 'Admissions First' from version 2 of this file that explains not only what this table once contained but also what game they are playing...

PROVIDER LEVEL DATA - ADMISSIONS - OF THE TOTAL NUMBER ADMITTED, HOW MANY WERE ADMITTED WITH CONFIRMED COVID-19 FOR THE FIRST TIME?

...I'm pretty sure folk get the picture. Sneaky huh? I attach a plot of 'admissions' as claimed by NHS England along with the limited data available for actual and genuine first admissions. On average, recycling of cases is doubling the admissions count (median rate = x2.3).



Source: <https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-hospital-activity/>

## COVID vs. 'Flu/Pneumonia

Doing the rounds of GOV/NHS/ONS websites right now is the claim that COVID deaths this year so far are running at three times the rate for influenza and pneumonia, with 48,168 deaths due to COVID and only 13,500 from pneumonia, with 394 due to influenza. Claims like this are always worth checking, so I decided to dive in.

There are several known problems with COVID death certification and clinical coding that suggest HMG are not playing a straight bat. According to NHS whistle-blowers it would appear that some non-COVID cases (bacterial pneumonia, for example) are being coded as COVID deaths, so this year's 'flu figures may well be lean (watch out for the flannel concocted to explain this). What I've done, therefore, is take historical counts of pneumonia and influenza for the period Jan 2015 – Dec 2019 and derive the 5-year mean monthly death count for the part-year period March – September so we may compare figures with the COVID outbreak.

I can reveal the 5-year monthly average death count in England for influenza and pneumonia for the period Mar – Sep is 1,811 deaths per month, with a mean of 5,363 attributed to COVID during 2020. We may initially conclude that HMG's claim of three times the rate is looking about right but there is one of those flies buzzing in the ointment....

ONS are refusing to release detailed data for influenza and pneumonia for 2020 but we may estimate figures from historical data, which indicates 42.6% of all respiratory deaths over the period 2015 – 2019 were attributed to influenza and pneumonia during Mar - Sep.

Applying this rate to the 4,777 respiratory-related deaths occurring Mar – Sep 2020 as given by ONS we arrive at an estimated 2,034 non-COVID acute respiratory deaths. Comparing an estimated 2,034 acute respiratory deaths with 5,363 COVID yields a factor of x2.64 – not quite "three times" but close enough. Except there is another big fly buzzing in the ointment... **WHY ARE WE COMPARING INFLUENZA AND PNEUMONIA DEATHS TO COVID DEATHS IN THE FIRST INSTANCE?**

If COVID is producing a broad range of symptoms – and many clinicians are certainly testifying to this fact – then considering influenza and pneumonia alone is missing out a significant part of the whole picture.

For example, if COVID is causing renal failure we need to add those deaths into our comparison study. If COVID is causing stroke (a common cause of young COVID death) then we need to add stroke deaths into our comparison study. If COVID is causing thrombotic events leading to myocardial infarction we need to add heart attack deaths into our comparison study. I could go on but hopefully folk get the picture. We are looking at a ‘straw man’ argument that has been deliberately established by our loving and knowledgeable government.

To illustrate the fallacy we shall consider all respiratory related death and not just pneumonia / influenza. If we do this we arrive at 33,441 respiratory-related deaths and 37,543 COVID deaths across England during 2020 for the period Mar – Sep. This yields a factor of x1.12 - a far cry from “three times”.

## **WHAT BED IS THAT THEN?**

Here's a perky little question to ask of anybody bleating on about COVID beds and the NHS bursting to capacity...

WHAT BED IS THAT THEN?

We need to ask this because hospital admissions don't always end in bed use (the majority don't) and bed use may mean a day bed or an overnight bed. This distinction is not something the general public will appreciate and right now NHS data bods are lumping day and overnight beds together. Admissions, day beds and overnight beds all have their own capacities so it is entirely feasible for the NHS to claim it is at capacity when overnight beds are under used.

## **Is The 'Flu Jab Leading To Excess Covid Death?**

The results of my study into vaccination interference are now in and I shall try and explain what has been done behind the scenes in plain English. We started out with the hypothesis of viral interference that was enshrined in a study of 6,120 military personnel by Wolff (2019), which indicated increased risk of coronavirus infection in those vaccinated for influenza. Vashishtha & Kumar (2020) were quick to pick up on Wolff's work and that of others, but with decent studies few and far between they were forced to conclude...

*“...we do not have sufficient data to establish or refute the association between influenza vaccination and higher susceptibility to coronavirus infection. We need to perform systematic studies urgently to find an answer to this question with regard to SARS-CoV-2. This is of vital importance since it is going to have far-reaching implications.”*

A recent article on [epidemiologyexplained.com](https://epidemiologyexplained.com) hit the hornet's nest with a big stick following consideration of COVID death rates in vaccine-laden countries to those with poor vaccination records Dr Allen Cunningham (author of a related BMJ paper and a retired paediatrician) stated:

*“...prompted by your viral interference article I went to Worldometer, the ECDC influenza vaccine article from December 2018, and our CDC's data on US vaccine uptake. Attached is a scatterplot showing the correlation between influenza vaccine coverage and COVID-19 death rates. The regression correlation coefficient ( $r$ ) = 0.692, and is statistically significant ( $p < 0.001$ ).  $r$ -squared = 0.48, indicating that 48% of the variation in COVID-19 death rates is explained by variations in influenza vaccine coverage. This is a pretty casual exercise, but it confirms what your article suggests, and supports previous articles associating flu shots with increased risk from non-influenza viruses.”*

This is a critical situation in which to leave everybody casually dangling and so I have invested in the region of 80 hours to obtain a robust answer using methodologies developed when I was engaged by the Directors of a NHS Trust to get to the bottom of a similarly alarming situation back in 2008.

In the first slide I plot out COVID deaths per million inhabitants against mean annual vaccination rates for the elderly (65 years and over) for 33 OECD countries in the northern hemisphere (data sources are given in the footnote to the slide). Whilst this certainly looks very real and somewhat alarming we have only half-baked the cake; we shall continue cooking this by appealing to common sense...

Most folk are blessed with common sense and you can tell this when they ask pertinent questions such as “what about differing population density?” and “what about age of population?” Such people instinctively know we have to level the international playing field so we can compare COVID deaths in Korea to COVID deaths in Mexico and not come to a nonsensical conclusion. This is where we say goodbye to the data analyst and hello to the statistician.



What we can do to level the playing field as statisticians is derive what is known in the trade as a 'propensity score'. In our case this is the propensity for folk to die of COVID given the current state of the population in terms of life expectancy, prevalence of respiratory disease, population density, proportion living in urban areas, age of population and so on.

Data for some 41 variables covering key issues such as these were collated and subject to factor analysis. The reason we have to resort to factor analysis is because these 41 raw variables are going to be highly correlated and we'll end up with a mushy mess of a statistical model if we simply throw them all in the pot. Factor analysis enabled me to boil all 41 raw variables down into just 8 dimensions (a.k.a. eigenvectors), these being:

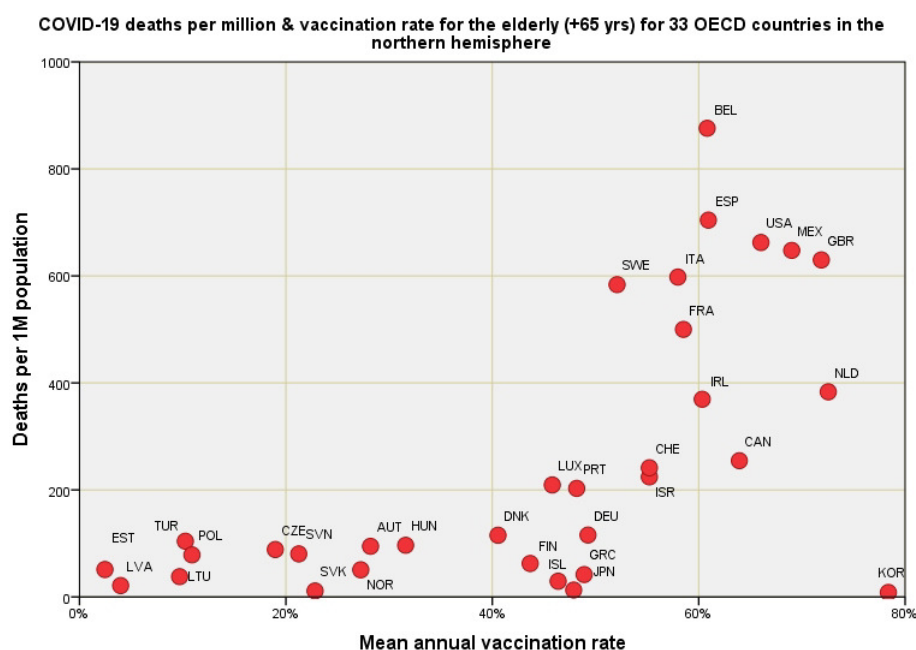
- Dimension 1: Young respiratory & non-respiratory deaths
- Dimension 2: Population age profile
- Dimension 3: Chronic lower respiratory deaths
- Dimension 4: Elderly acute respiratory deaths
- Dimension 5: Land area & population
- Dimension 6: Influenza deaths & urbanisation
- Dimension 7: Young female deaths
- Dimension 8: Population density

These dimensions, plus their statistically significant interactions, were then used in the prediction of COVID deaths per million inhabitants using a procedure called Generalised Linear Modelling (GLM). In the second slide below I plot out how the resulting 20-parameter GLM model performed in predicting the observed COVID death rate. As we can see it performs rather well indeed, with  $r = 0.982$  ( $p < 0.001$ ). This indicates that my model explains 96.4% of the observed variation in the COVID death rate, which is going some.

With the statistical model producing an excellent fit to the data like this what we then do is analyse the model residuals, these being observed COVID deaths minus predicted COVID deaths (i.e. propensity for COVID death) and see what we have left. What we have left provides an estimate of excess COVID death after we have accounted for variations arising in that long list of 41 raw variables; this is our level international playing field and this is presented as the third slide. We now see quite clearly that the 'flu jab is not associated with increased COVID mortality, there being absolutely no correlation ( $r = 0.032$ ,  $p = 0.863$ ,  $n = 32$ ).

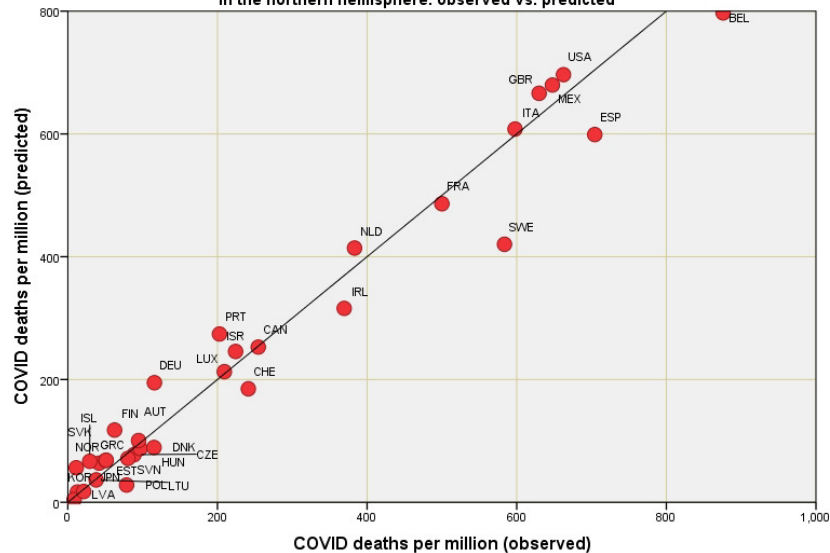
Thus, multivariate statistical modelling reveals there is no evidence to support alarmist claims that the 'flu jab is responsible for excess COVID deaths. It certainly appears this way using superficial (bivariate) analyses but when we adjust for the propensity to die in each country prior to COVID then we find that this is an illusion that quickly evaporates.

If I were to summarise 80 hours of study into one final sentence it would be to state that the alarming relationship we see between COVID deaths and the 'flu jab has come about because the international playing field is far from level.



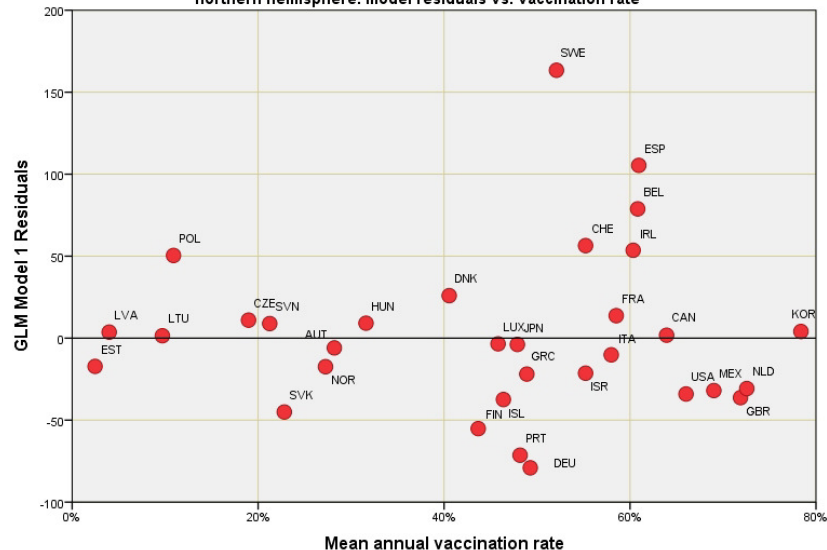


**A Generalised Linear Model for the prediction of COVID-19 deaths per million among 32 OECD countries in the northern hemisphere: observed vs. predicted**



Data sources: OECD (2020), Influenza vaccination rates (indicator). doi: 10.1787/e452582e-en; <https://www.worldometers.info/coronavirus>; United Nations Data Explorer <http://data.un.org/Explorer.aspx>

**A Generalised Linear Model for the prediction of COVID-19 death rates among 32 OECD countries in the northern hemisphere: model residuals vs. vaccination rate**



Data sources: OECD (2020), Influenza vaccination rates (indicator). doi: 10.1787/e452582e-en; <https://www.worldometers.info/coronavirus>; United Nations Data Explorer <http://data.un.org/Explorer.aspx>

## What Happened To Death?

One of those quick little tables I wanted to cook up so I can get a feel for what is happening to what should be the main driver of lockdown and draconian policy. Herewith a simple count of deaths and cases by pandemic phase along with crude mortality. So what happened to death? This is a darn good question that the press and authorities are avoiding, and here are some possible answers...

- All of the most vulnerable folk died during the early stages of the pandemic, leaving a more resilient population.
- The virus has mutated into a weaker strain.
- Immune systems are boosted during the summer months.
- The PCR test isn't a reliable diagnostic tool and, without the diagnostic input of qualified physicians, we are now largely counting false positives and folk who have already recovered from an earlier infection.
- Death certification isn't reliable, with WHO guidelines serving to exacerbate the problem

Does a 1.1% case fatality rate warrant draconian government measures?

## United Kingdom 28-day COVID deaths<sup>[1]</sup> and combined pillar 1 & 2 cases<sup>[2]</sup> by pandemic phase

| Pandemic phase         | Deaths | Cases   | Case Fatality Rate (%) |
|------------------------|--------|---------|------------------------|
| Early (Mar - Apr)      | 28,470 | 177,490 | 16.0%                  |
| Mid (May - Jun)        | 12,161 | 107,295 | 11.3%                  |
| Late (Jul - Aug)       | 911    | 54,728  | 1.7%                   |
| Transition (Sep - Oct) | 2,613  | 236,118 | 1.1%                   |
| All phases             | 44,155 | 575,631 | 7.7%                   |

### Notes:

[1] 28-day deaths with a positive test result or COVID mentioned on the death certificate

[2] Not medical cases in the strict sense but people testing positive. Test pillar 3 and 4 cases omitted

### Data Source:

<https://coronavirus.data.gov.uk/>

Data retrieved for 1st March - 20th October 2020

30th October 2020

## Hospital Admissions Explained

Public Health England, the Department for Health and Social Care and the NHS have been producing graphical evidence indicating that COVID hospital admissions have been rising, especially for the elderly. These graphs require some explanation because they do not show what the public think they show.

What these three official bodies are calling 'admissions' are, in fact, an amalgam of admissions plus counts of inpatients that happen to test positive during their stay. Between 1st April and 30th September NHS England recorded 100,929 COVID 'admissions' of which 77,150 were inpatients already in hospital for other reasons (76.4%). Thus, only 23.6% of what official sources are calling admissions are, in fact, admissions as the public would view them.

'Admissions' also includes re-admissions, such that a positive testing patient returning for regular treatment is multiply counted. Between 1st July and 30th September NHS England recorded 3,001 COVID admissions to hospital of which only 1,345 were first time admissions (44.8%).

The public will naturally assume that when they are looking at an official graph of rising COVID admissions they are looking at people going to hospital for the first time after testing positive. They are not. They are looking at a deceptive amalgam of admissions, re-admissions and inpatients that, together, are dubbed 'admissions' by the authorities.

These three bodies between them somehow fail to provide what should be the most important figures to publish – people going to hospital for the first time after testing positive - so I'll do it for them. We have already seen that only 23.6% of 'admissions' are folk actually going to hospital after testing positive, and we have seen that only 44.8% of 'admissions' are first time admissions. Putting these two rates together we arrive at an estimated 10.6%.

It is a most extraordinary realisation that, when looking at official slides showing the rise in admissions, only 10.6% of cases depicted actually fall in line with public expectation, this being of a member of the public physically going into hospital for the first time after testing positive.

The issue doesn't stop there because the public will naturally assume those estimated 10.6% of cases going to hospital for the first time after testing positive are going to hospital to be treated for COVID. Not so. In a footnote to data tables NHS England explain:

*"... from September 2020 onwards, publication of the COVID hospital time series now includes data from Independent Sector Mental Health Learning Disability and Autism (IS MHLDA) providers, which had previously been excluded due to data quality concerns."*

'Admission to hospital' thus means any admission to any service provider, whether or not that provider is concerned with the treatment of COVID cases. For example, a pregnant woman testing positive will be counted as a COVID case when she is admitted for delivery.

The public naturally want to know how many people are going to hospital for the first time after testing positive to be treated for COVID symptoms in that hospital. I can tell you now that these figures have never been made available to the public.

Neither does the problem stop there for we have to consider what a positive RT-PCR test result actually means. In the eyes of the public this equates to somebody who is infectious and sick with symptoms but this is not necessarily the case - they may not even be carrying any virus.

From the horse's mouth (in bold, I may add)...

*"RT-PCR detects presence of viral genetic material in a sample but is not able to distinguish whether infectious virus is present."*

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/926410/Understanding\\_Cycle\\_Threshold\\_Ct\\_in\\_SARS-CoV-2\\_RT-PCR\\_.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/926410/Understanding_Cycle_Threshold_Ct_in_SARS-CoV-2_RT-PCR_.pdf)

**11<sup>th</sup> November 2020**

## ***COVID & Ionising Radiation Overdose: A Comparison***

Out of sheer interest I have started cataloguing lesser known COVID symptoms, as reported in case studies, and comparing these with those arising from ionising radiation overdose, whether through nuclear accident or as part of planned therapy.

### **A Comparison of Symptoms**

| <b>Ionising Radiation Sickness or Therapy</b> | <b>COVID-19</b>                                  |
|-----------------------------------------------|--------------------------------------------------|
| Aches & pains                                 | Aches & pains                                    |
| Anorexia                                      | Anorexia                                         |
| Conjunctivitis                                | Conjunctivitis                                   |
| Diarrhoea                                     | Diarrhoea                                        |
| Dizziness & disorientation                    | Dizziness                                        |
| Dry cough, difficulty swallowing              | Dry cough                                        |
| Fever                                         | Fever                                            |
| Hair loss                                     | Hair loss                                        |
| Headache                                      | Headache                                         |
| Infections                                    | Infections                                       |
| Initial mild & second serious stage           | Initial mild & second serious stage              |
| Internal bleeding & bruising                  | Skin rash, COVID 'toes', blood clotting & stroke |
| Loss of taste or smell                        | Loss of taste or smell                           |
| Low blood pressure                            | Low blood pressure                               |
| Nausea & vomiting                             | Nausea & vomiting                                |
| Radiation pneumonitis                         | Breathing difficulties & chest pain              |
| Sore throat                                   | Sore throat                                      |
| Tachycardia                                   | Tachycardia                                      |
| Tiredness, weakness & fatigue                 | Tiredness, weakness & fatigue                    |

Sources: World Health Organisation, NHS, NORD, CDC, Mayo Clinic, UPMC Hillman Cancer Centre, BMJ

***5th December 2020***

In Nazi Germany Volksgesundheit (public health) took complete precedence over individual health care. Physicians and medically trained academics legitimized and helped to implement Nazi policies aiming to cleanse German society of people viewed as biologic threats to the nation's health. Unquestioning acceptance of these policies by sufficient of the faithful masses was critical. The problem we face today, as was faced then, is that ordinary folk didn't understand what was actually happening, thinking it to be a good thing simply because they were told so by those in authority. The greatest danger to any society lies with uncritical and unquestioning minds among them. What is chilling is that we can all look to our own family, friends and colleagues to find those who would have made good Nazis, who are subsequently reacting to this 'pandemic' in a similar vein.

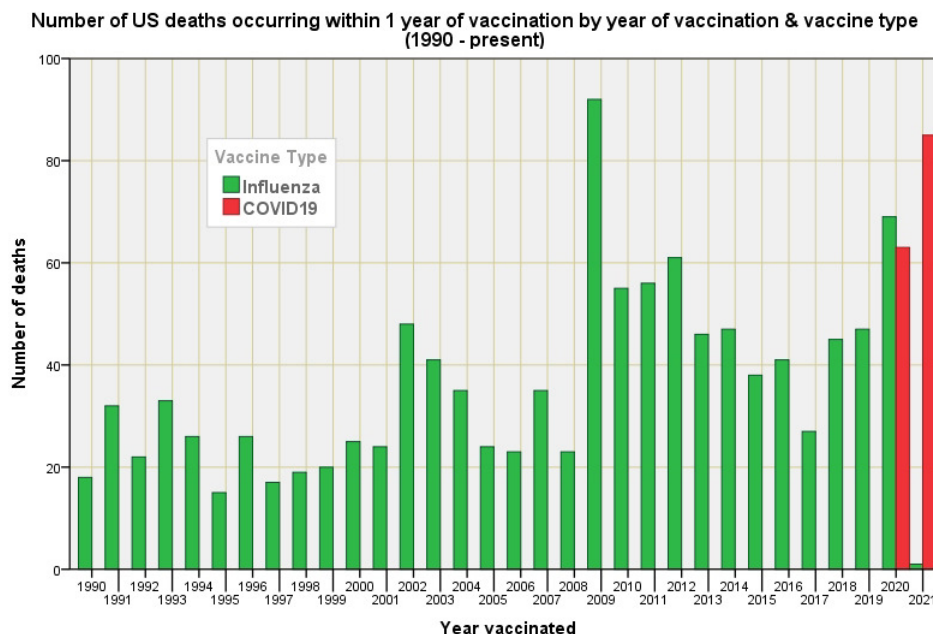
# John Dee, His Almanac

28th January 2021

## VAERS Mini Project: Result 1

I have been up since 4am interrogating VAERS and building a database for statistical analysis. I can now report that since 1990 a total of 1,304 deaths after vaccination for influenza/COVID19 have been registered in the system, some 1,279 of which occurred within a year of inoculation. I present a bar chart that reveals the total number of registered deaths by year of vaccination and vaccine type to give us a feel for what is actually going on. There are a few key caveats and features here worth noting:-

1. Deaths may not be causal despite temporal proximity.
2. We have no idea of the number of doses administered in each year nor do we have any idea of the severity of any disease outbreaks (influenza, COVID19 or anything else) that will influence outcomes.
3. Data for 2021 is to 15th January. Yes indeed, that large red bar after just 15 days of data is something of a shocker!
4. The first COVID19 shots outside of trials took place on 14th December 2020, thus the red bar for 2020 is based on just 17 days of data. Again something of a shocker given near parity with influenza jab 'deaths' over a full season, but ideally we need to know the number of doses administered for both.
5. Deaths following influenza jabs during 2020 seem on par for the course but the weedy green bar for 2021 is looking a little sickly - we need to see how this pans out but bear in mind the 'flu jabbing season doesn't really get going until autumn.



Source: Vaccine Adverse Event Reporting System (VAERS) <https://wonder.cdc.gov/vaers.html>

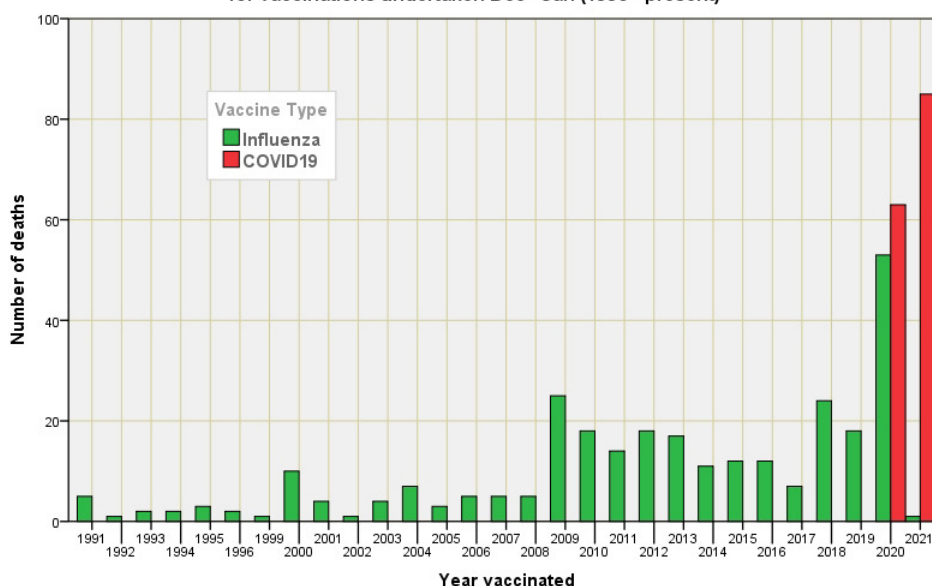
## VAERS Mini Project: Result 2

One big fat problem in trying to compare COVID19 deaths with historic influenza deaths is that data are only available for December 2020 and January 2021, and not even for full months at that! What we can do in an attempt to compare apples with apples is to only select influenza vaccinations that have taken place during December and January each year and then to only include deaths whose survival period was less than or equal to one month. This trimmed dataset for the influenza jab thus imitates the limited dataset we have for the COVID19 shot.

When this is done we find a total of 438 deaths registered in VAERS, 290 of which followed an influenza jab and 148 of which followed a COVID19 shot. Given the influenza death toll represents all years from 1990 to 2021 then we may wish to raise an eyebrow at just how many COVID19 shots are represented in the sample.

They say that a picture tells a thousand words so here is that bar chart again but this time we are comparing apples with apples or as near as I can muster. This chart compares deaths following both types of jab in a more appropriate manner. If the COVID19 shot is 95% effective as claimed why are we seeing record Dec-Jan deaths following vaccination?

Number of US deaths occurring within 1 month of vaccination by year of vaccination & vaccine type for vaccinations undertaken Dec - Jan (1990 - present)



Source: Vaccine Adverse Event Reporting System (VAERS) <https://wonder.cdc.gov/vaers.html>

### VAERS Mini Project: Result 3

Some quick and dirty top-line figures for you all. As of 15th January VAERS is reporting 148 deaths, 170 life threatening reactions, 65 permanent disabilities and 1,883 hospitalisations following COVID19 shots, making 2,266 unpleasant events in total. Given around 16.5 million shots have been administered then crude risk of a serious outcome fetches up at 0.014% - all things being equal, of course, and as things stand after 32 days into the experiment.

2nd February 2021

### Some Notes on mRNA Vaccine Safety

The Pfizer-BioTech Fact Sheet for Healthcare Providers Administering Vaccine (revision 12/2020) states the following:-

*'Additional adverse reactions, some of which may be serious, may become apparent with more widespread use of the Pfizer-BioNTech COVID-19 Vaccine.'*

The FDA Briefing Document on the Pfizer-BioNTech COVID-19 Vaccine, for consideration at the Vaccines and Related Biological Products Advisory Committee Meeting December 10, 2020, states:-

*'There are currently insufficient data to make conclusions about the safety of the vaccine in subpopulations such as children less than 16 years of age, pregnant and lactating individuals, and immunocompromised individuals.'*

*'...However, risk of vaccine-enhanced disease over time, potentially associated with waning immunity, remains unknown and needs to be evaluated further in ongoing clinical trials and in observational studies that could be conducted following authorization and/or licensure.'*

Homo sapiens chromosome 8, GRCh38.p13 Primary Assembly consists of an 18 base sequence – CTCCTTTGTTGTGTTGT - this being an identical sequence to that expressed in a WHO RT-PCR real time assay for the detection of SARS-COV-2 (see image). This has lead folk like Dr Kaufmann to suggest Human Chromosome 8 could trigger a false positive/match for the virus in some cases of the use of some protocols (a link to his informative YT video may be found in the comments section).

The question we should ask of vaccine manufacturers is whether this same sequence is included in the mRNA vaccine sequence. If so, then the question we should ask of genetic engineers is whether the human immune response is going to produce antibodies that could well bind to human chromosome 8 as well as the alleged SARS-COV-2 'spike' protein that mRNA therapy is designed to generate. Links to sources are provided in the comments section.

#### Primers and probes

| Name                        | Sequences (5'-3')                            | Length (bases) | PCR product size | Ref. |
|-----------------------------|----------------------------------------------|----------------|------------------|------|
| <b>RdRp gene / nCoV_IP2</b> |                                              |                |                  |      |
| nCoV_IP2-12669Fw            | ATGAGCTTAGTCCTGTGG                           | 17             | 108 bp           | 1    |
| nCoV_IP2-12759Rv            | CTCCCTTTGTGTGTGTG                            | 18             |                  |      |
| nCoV_IP2-12696bProbe(+)     | AGATGCTTGTGCTGCCGTA [5']Hex [3']BHQ-1        | 21             |                  |      |
| <b>RdRp gene / nCoV_IP4</b> |                                              |                |                  |      |
| nCoV_IP4-14059Fw            | GGTAACGTGATGATTCG                            | 19             | 107 bp           | 1    |
| nCoV_IP4-14146Rv            | CTGGTCAAGGTTAATATAGG                         | 20             |                  |      |
| nCoV_IP4-14084Probe(+)      | TCATACAAACCACGCCAGG [5']Fam [3']BHQ-1        | 19             |                  |      |
| <b>E gene / E_Sarbeco</b>   |                                              |                |                  |      |
| E_Sarbeco_F1                | ACAGGTACGTTAATAGTTAATAGCGT                   | 18             | 125 bp           | 2    |
| E_Sarbeco_R2                | ATATTGACGACGTACGCACACA                       | 20             |                  |      |
| E_Sarbeco_P1                | ACACTAGCCATCCTTACTGCGCTTCG [5']Fam [3']BHQ-1 | 20             |                  |      |

1/ National Reference Center for Respiratory Viruses, Institut Pasteur, Paris.

2/ Corman et al. Eurosurveillance<sup>1</sup>

24th February 2021

## Gibraltar

Back on 19th August 2020 when I was merrily running statistical analyses Gibraltar was a rather healthy place to be with only 222 cases, 195 recovered cases, 27 active cases and zero deaths after 171 days of global pandemic. In terms of death rate it ranked equal 190th along with 24 other countries with zero deaths. Let's call this phase 1.

This morning, on 24th February 2021, I took a look at the worldometer data again to find Gibraltar up in first place with 2,702 deaths per million population and a running tally of 4,234 cases, 4,115 recovered cases, 30 active cases and 91 deaths.

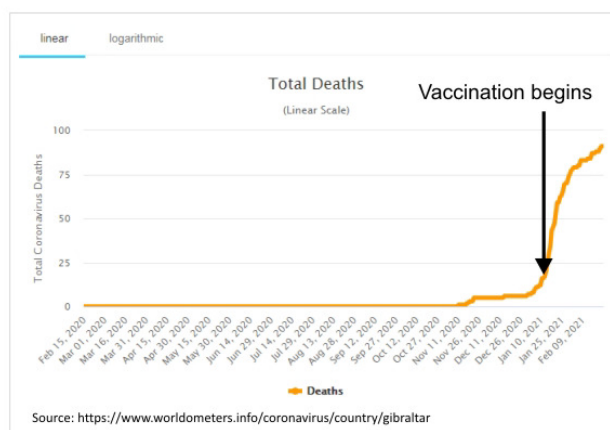
If we subtract these two sets of figures we find an increase of 4,012 cases (x19.1 factor increase), 3,920 recovered (x21.1 factor increase), 3 active (x1.1 factor increase) and 91 dead (infinite factor increase) in just 188 days from 20th August 2020 to 24th February 2021. Let's call this phase 2.

Figures for phase 1 and 2 are staggeringly incomparable and we should ask just what the heck is going on. If we take the recovery rate as a yardstick we find 87.8% recovery for phase 1 and 97.7% for phase 2, so the virus hasn't got any more vicious and health service providers may have upped their game as expected.

As we all should know the number of cases depends on the number of tests as well as viral dynamics. In phase 1 the case rate per 1,000 tests was down at 8.0, whereas during phase 2 it was up at 26.2. How could the same virus with the same recovery profile, that had already spread across this small island during phase 1, suddenly get jacked up by a factor of x3.3 for case rate detection? Did the same virus mysteriously get more contagious or did they up the sensitivity of the RT-PCR test?

Experts claim that the virus tends to kill the most frail and elderly during the first stages of an outbreak. This being the case why are 91 deaths suddenly appearing in phase 2 when no deaths occurred in phase 1? Could this be anything to do with Gibraltar's policy of vaccinating every citizen? Fact checkers and authorities say not but take a look at the graph for yourself and ask why the same virus is suddenly so much more deadly given the same recovery profile.

Total Coronavirus Deaths in Gibraltar

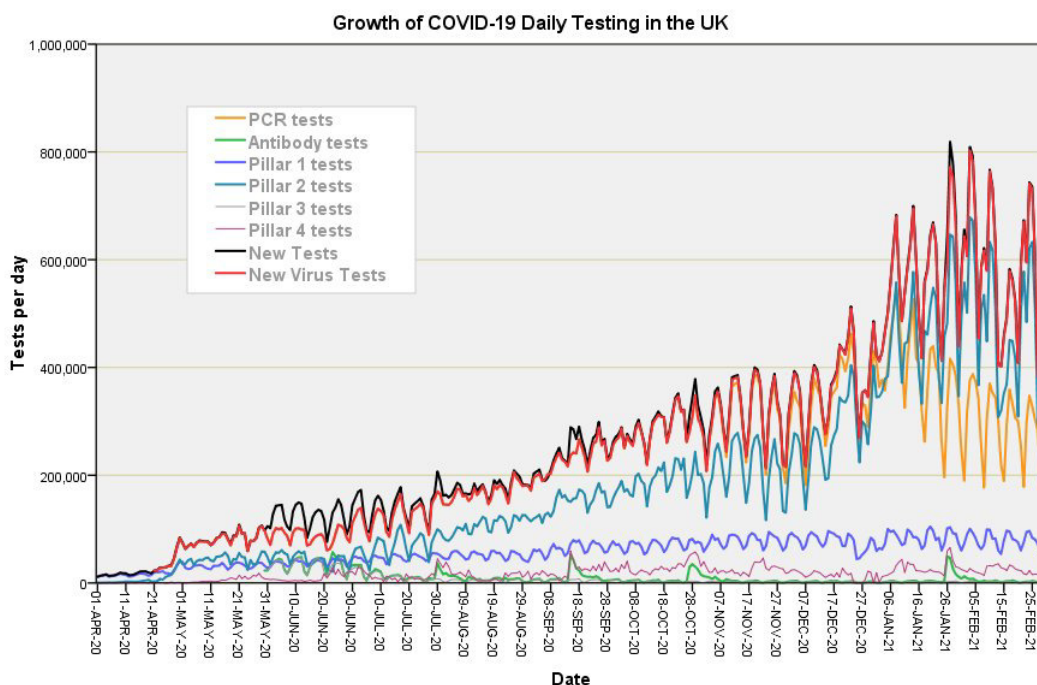




3rd March 2021

## Growth In UK Testing

Just updating my files with the latest official UK data and thought folk might like a peek at the growth in daily testing. No testing means no cases, and no cases means no admissions, and no admissions means no COVID beds, and no COVID beds means no COVID mechanical ventilation beds, and no mechanical ventilation beds means no COVID deaths - unless cases are clinically diagnosed by experienced physicians as they should be.



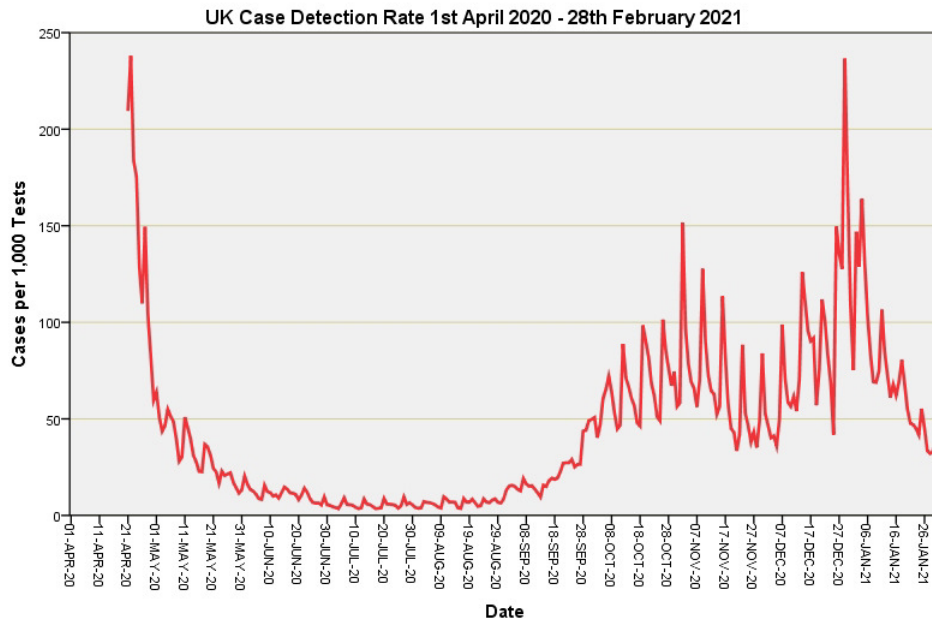
Source: <https://coronavirus.data.gov.uk/>

## UK Case Detection Rate

Here is a graph that the UK government is not likely to reproduce using its own data - the case detection rate over the period 1st May 2020 - 28th February 2021 in terms of detected cases per 1,000 tests.

It is worth noting that PHE put out what they call a 'rate' graph but this is a density function based on cases per 100k population that rests on the assumption that the daily test rate has remained unchanged over time and is equal across regions. This is most certainly not the case (please excuse the pun) and so PHE are putting out garbage.

I shall remind folk that a 'detected case' is not a clinical case in the strict sense of the term and is merely a positive swab test result, which is meaningless without a clinical diagnosis - and that's before we consider the PCR test as unfit for purpose. What we have, then, is nonsense slathered in tripe but it's what experts seem to peddle these days.



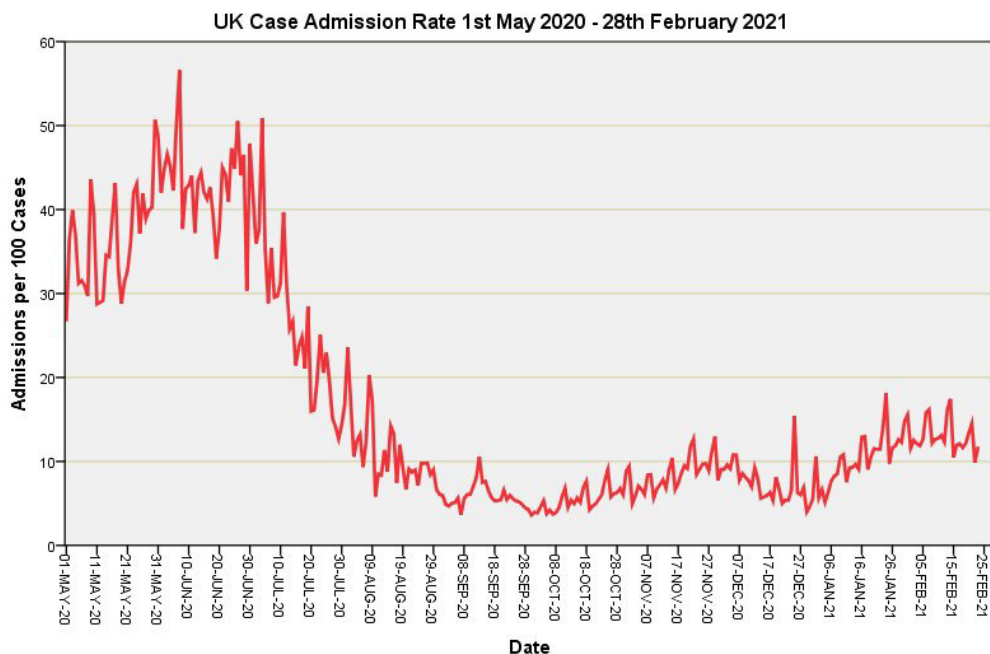
Source: <https://coronavirus.data.gov.uk/>

### ***UK Case Admission Rate***

Setting aside the fact that a COVID 'case' isn't a clinical case as such but a positive test result minus a diagnosis and that admissions to hospital figures include re-admissions (same person counted multiple times), inpatients in hospital for non-COVID reasons that happen to test positive during their stay and admissions for any condition whatsoever so long as it is within 14-days of a positive test, and that 'hospital' means any health service provider regardless of whether they actually treat COVID cases (e.g. admissions to mental health and gynaecological units), then we arrive at this chart.

Here we have hospital admissions per 100 detected cases for the period 1st May 2020 to 28th February 2021. It is worth asking why admissions per 100 cases is now hovering down around 10 - 50 when it was surging at a whopping 40 - 50 back last year. Has the virus become unwell?

Again not a rate graph you are likely to see from PHE despite this being based on official data, and despite it being rather more informative than the sensationalist tripe they serve daily.



Source: <https://coronavirus.data.gov.uk/>

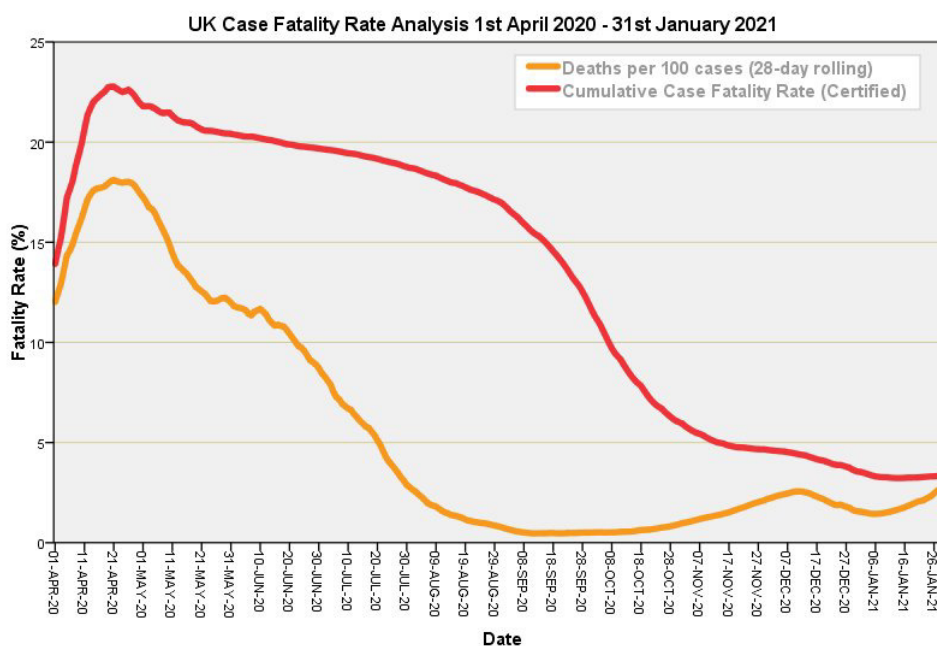
## UK Case Fatality Rate

The important thing to note here is that case fatality rate isn't infection fatality rate. At the beginning of the pandemic back in 2020 case fatality rate figures were bandied about until some bright spark pointed out these were not infection fatality rates!

The classic way to compute case fatality rate is to divide the accumulated death count by the accumulated case count and this is represented by the red line. One drawback with this method is that the death rates during the initial stages of a pandemic can dominate estimates, sometimes greatly over- or under-estimating the 'true' (long term) rate. With this in mind I've tried a rolling 28-day accumulated count of deaths and cases to see how this approach stacks up (orange line).

We now see that domination effect get into its stride from May 2020 through to September 2020, after which both curves converge. As at 31st January 2021 the cumulative case fatality rate estimate sits at 3.37% whilst the 28-day rolling estimate sits at 2.98% - we may as well call it a more memorable 3%!

The kink upward in the orange curve after 6th January is rather interesting because vaccination is supposed to be reducing risk of severe symptoms.



7<sup>th</sup> March 2021

## VAERS Analysis

The vaccine adverse event reporting system (VAERS) of the CDC relies on voluntary submissions and cannot be considered to be a comprehensive database of all vaccine injury. Nevertheless it is a valuable resource in allowing us to track outcomes following vaccination.

Whilst we cannot attribute causality to adverse outcomes, particularly in the frail and elderly where death is often a complex end-point, we can scrutinise data with a view to using VAERS as a first level of alarm if a novel vaccine is giving cause for concern.

In the case of vaccines developed to combat COVID-19 we may better judge performance by comparing adverse outcomes for these novel vaccines with adverse outcomes for well established vaccines developed for influenza, and particularly so given the respective target populations are near identical.

For most people the outcome of concern is death and so we may compare deaths occurring within 1 month of vaccination for vaccinations undertaken during the months of December, January and February each year. When this is done we discover a rather alarming situation in that deaths following a COVID-19 jab are outstripping deaths following a 'flu jab by a considerable margin.

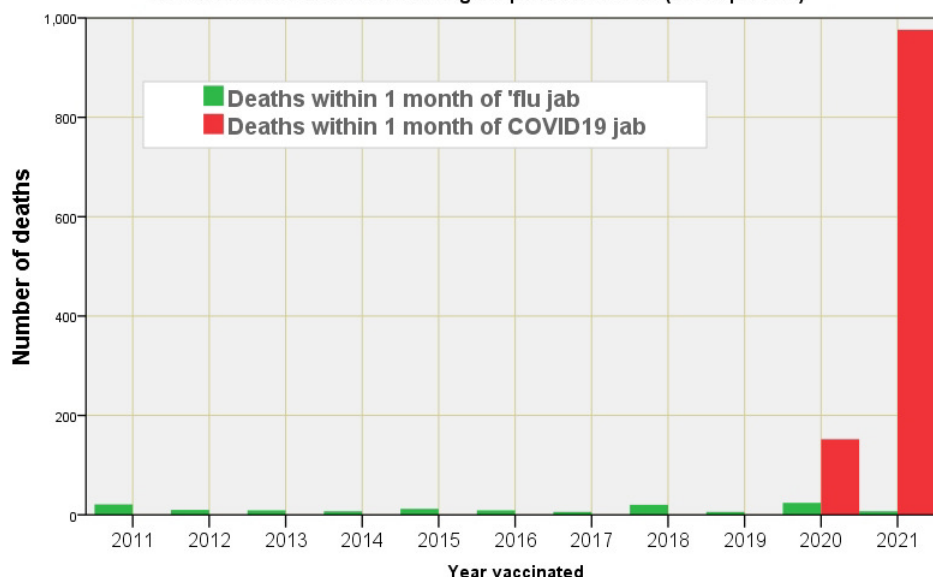
The annual average death rate for standard 'flu jabs over the period 2011-2021 amounts to an estimated 11.91 deaths for deaths occurring within one month of vaccinations undertaken December - February. In comparison, the annual average rate for the COVID-19 'jab is 564.00

deaths, the factor difference being a staggering x47.4. That is to say for every death occurring within one month of a 'flu jab we find 47 COVID-19 jab deaths.

At this stage we have no idea of the relative number of shots given but it is highly unlikely that 47 times the number of COVID-19 shots have been given in comparison to the widely used battery of 'flu shots.

In conclusion, alarm bells should be ringing within the corridors of CDC and pretty much all other organisations concerned with public health (and yes, that should include the utterly irresponsible media). We may well be heading for an unprecedented global clinical catastrophe.

Number of US deaths occurring within 1 month of vaccination by year of vaccination & vaccine type for vaccinations undertaken during the period Dec - Feb (2011 - present)



Source: Vaccine Adverse Event Reporting System (VAERS) <https://wonder.cdc.gov/vaers.html>

11<sup>th</sup> March 2021

## New Admissions vs Detections

I don't know whether anybody else has noticed but Public Health England, that great guardian of good public health, doesn't publish anything imaginative. Neither does it publish anything remotely useful for clinicians. We get treated to the same 'numbers going up' time series graphs that may well fool the public but they don't fool anybody who realises those raw numbers have not been standardised for the changing number and types of test, the changing RT-PCR cycling threshold and the ever-changing definitions as to who and what is counted and when. Today I'd like to try something colourful and imaginative by producing a series of scatterplots using data pulled down from the GOV coronavirus dashboard to see if we can fathom the hidden games.

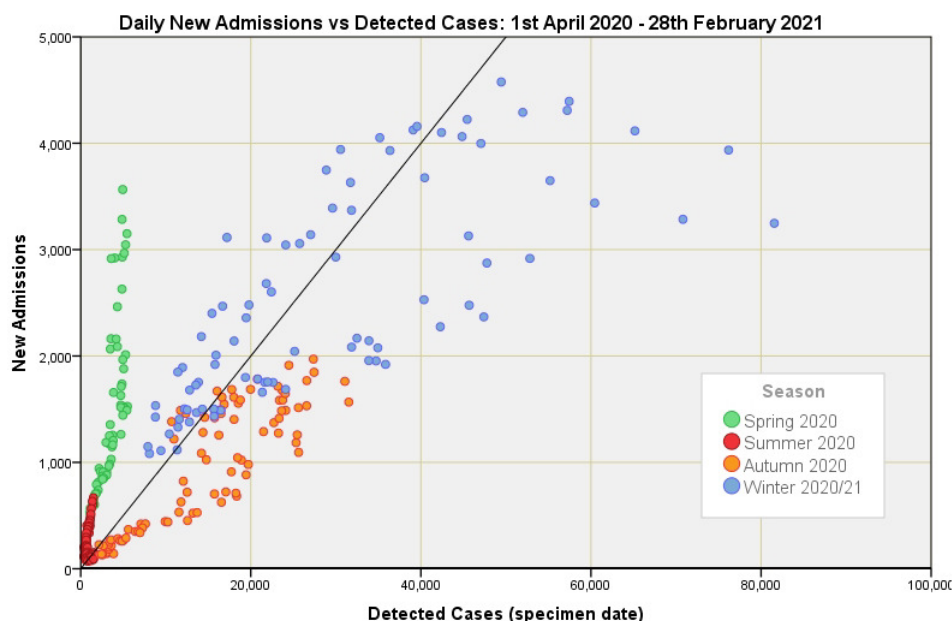
In this first plot we have the daily number of new admissions for the period 1st April 2020 - 28th February 2021 plotted against the daily number of detected cases. The thin black line is the function  $y=0.1x$  which, in plain English, marks out the relationship of one new admission per 10 detected cases (i.e. 1 in 10)

Back in Spring and Summer 2020 the relationship between daily admissions and daily detected cases was nice and tidy and pretty darn steep; detected cases converted into admissions with a high degree of consistency. During Autumn of 2020 something strange happened - that tidy relationship observed at the beginning of the outbreak broke down and started to scatter well below the 1 in 10 rate line.

We may note that on 13th September 2020 the DHSC started including admissions to mental health units as admissions to hospital (presumably to boost falling numbers). The result is that splodgy orange mess below the 1 in 10 line. Clinically speaking such data are fit for the bin (though it is apparently good enough for PHE).

We now arrive at the expanse of blue blobs for last Winter, which present an even bigger mess. Winter looks positively schizophrenic with a tract of points rising above the 1 in 10 line and another tract of points falling well below, with some going off sideways. This is not the scatter we should see from a coherent data set generated by a coherent testing regime according to coherent definitions. This is what you get when you change the goalposts to maximise case numbers for political purposes - the disease itself will behave far more graciously.

All in all we have at least 6 data subgroups masquerading as one coherent time series. I'm pretty darn sure bods at PHE already realise this because briefing senior NHS managers is what I used to do for a living. I can smell the deception and taste the rhetoric brewing 140 miles away!



Source: <https://coronavirus.data.gov.uk/>

## Hospitalised Cases vs Admissions

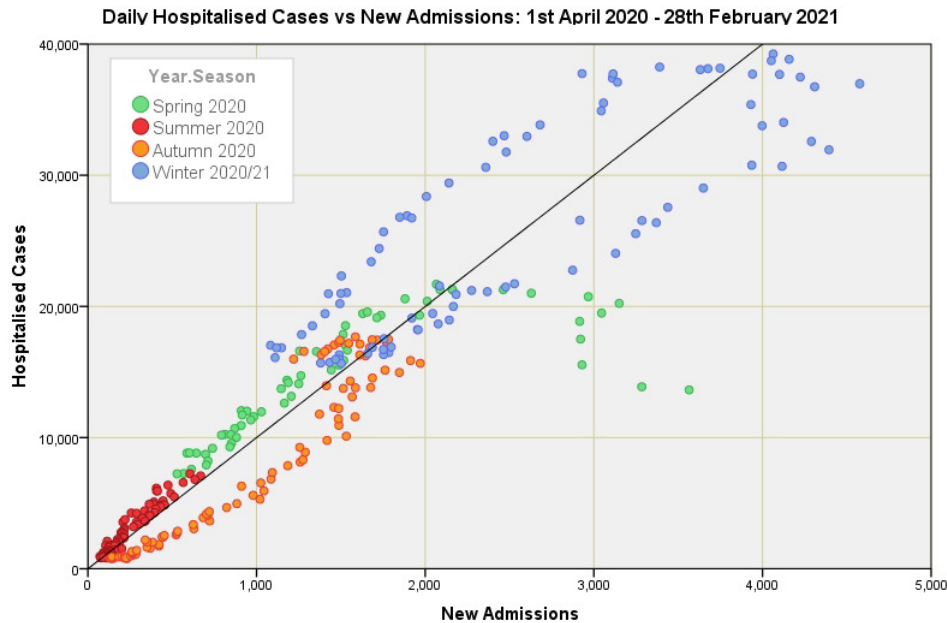
Admission to 'hospital' (by definition we should strictly say service provider since not all admitting 'hospitals' are hospitals that treat COVID; gynaecology units, for example, will admit positive-testing pregnant women that are counted in the DHSC grand total) is defined by folk testing positive 14 days prior to admission or folk already in hospital for whatever reason that also happen to test positive during their stay (inpatients). Thus, admitted folk don't have to be infectious, neither are they necessarily suffering COVID-like symptoms (asymptomatic cases). They may also not be carrying any virus (false positives).

What we can do now is go up a gear and take a look at how new positive-testing admissions to service providers in general have converted into hospitalised cases (again these folk are not necessarily suffering from COVID symptoms and are not necessarily carrying any virus; positive-testing renal patients in acute renal failure, for example, will count in the grand scheme of things).

The black line rate function for our eyeballs this time is  $y=10x$ , meaning for every new positive-testing 'admission' there are ten times as many positive-testing hospitalised cases. Clearly all these people must have come from somewhere and the answer is that they were already inpatients waiting for treatment for some other reason than COVID. In plain English there are around 10 positive-testing inpatients for every positive-testing new admission, so COVID is essentially an institutional disease, though the public perceive it as a blue-light-street-to-A&E affair largely thanks to the utterly irresponsible mainstream media.

Again we see cohesion back in Spring and Summer 2020 that falls into disarray as the data collection goalposts are repeatedly moved. That striking orange band tucked under the black line is a fine example of bias arising from the decision to include data from mental health providers in the overall figures - admissions to mental health units tend to be on a day case basis. Winter once again exhibits a fruity loop.

Now here's the thing... if the pandemic was becoming rather nasty with all these alleged new UK strains as the UK government claims then we'd expect to see a persistent rise in the rate of hospitalisations per admission for Winter 2020/21. Except we don't, we get a muddled picture.



### ***COVID occupied MV Beds vs hospitalised Cases***

Shifting up another gear and things are now getting serious. Anybody on a mechanically ventilated bed is going to be there for a darn good reason but that reason is not necessarily COVID-related - bacterial pneumonia is still a thing as well as a raft of other unfortunate conditions.

Back in Spring 2020 we see a tight relationship between MV bed occupancy and hospitalised folk testing positive that also exhibits the highest rate. This is when things were pretty darn serious. The rate remained nice and tight but cooled off during Summer 2020 to follow the thin black line, this being set to  $y=0.1x$  i.e. 1 in 10. To have one in ten inpatients requiring a MV bed is still pretty hairy going.

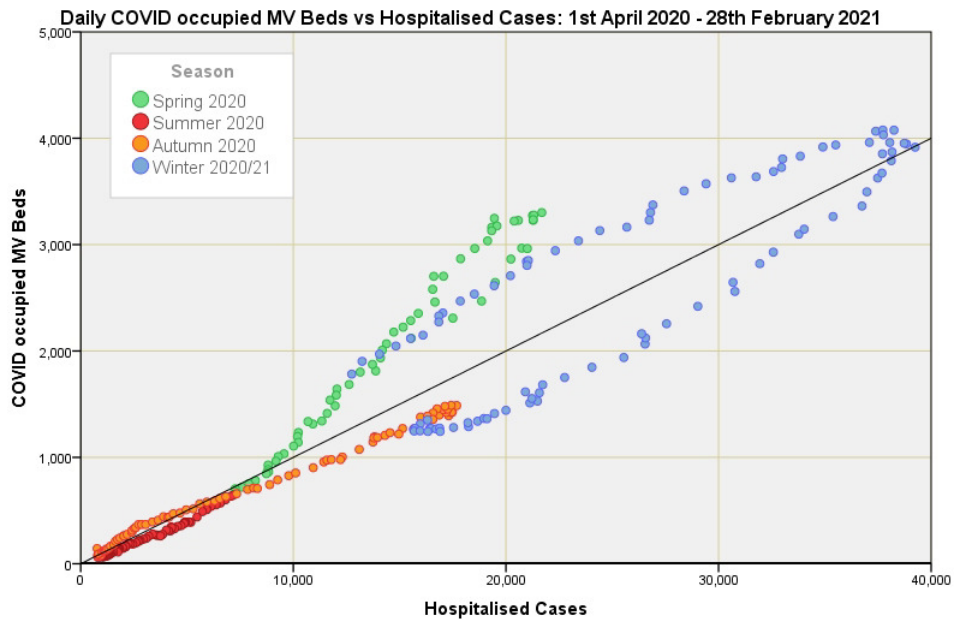
We may note that the relationship remains tight right through Autumn 2020, this is because mental health and other service providers don't operate MV beds. In plain English, the puffed-up numerical nonsense concocted by the DHSC to inflate numbers no longer applies - we're looking at the sharp end of COVID for the first time.

Winter still remains a fruity loop, though is now a better-behaved loop. What we are looking at here is the surge in seasonal illness (top loop) reaching a peak during December, after which MV bed requirement naturally goes into decline. How many of these are genuine COVID cases and how many mis-coded respiratory conditions is impossible to say.

One thing is for sure and that is seasonal influenza didn't magically disappear this year, neither did umpteen types of bacterial and viral pneumonia, not to mention chronic conditions such as emphysema/COPD, yet according Dr Susan Hopkins of PHE that is exactly what we are supposed to believe.

Are things getting worse with this alleged new UK strain? Absolutely not. The greatest rate of conversion from hospitalised patient to MV bed occupancy was witnessed back in Spring 2020 when the peak of the pandemic saw around 3,000 MV beds with 20,000 hospitalised cases (around 1 in 7).



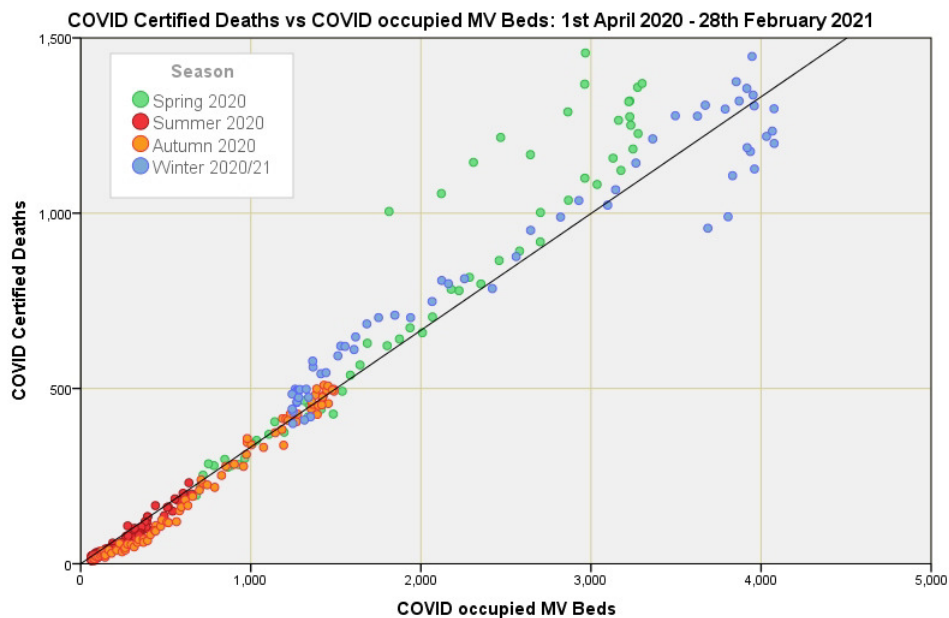


Source: <https://coronavirus.data.gov.uk/>

### ***Certified COVID deaths vs COVID occupied MV Beds***

And so we arrive at the final frontier, with the picture tighter than ever before. Setting aside major issues with death certification of COVID under WHO guidelines we can safely say these folk were in a serious condition one way or another.

There are couple of clusters of outliers either side of my nominal 1 in 3 rate line that are worthy of further investigation but the key story here is of consistency. Back in Spring 2020 we more or less observed one certified COVID death per 3 occupied MV beds and that has been the case more or less ever since. If there is a new UK super-deadly strain then it is not showing up in the Winter 2020/21 data.



Source: <https://coronavirus.data.gov.uk/>

13th March 2021

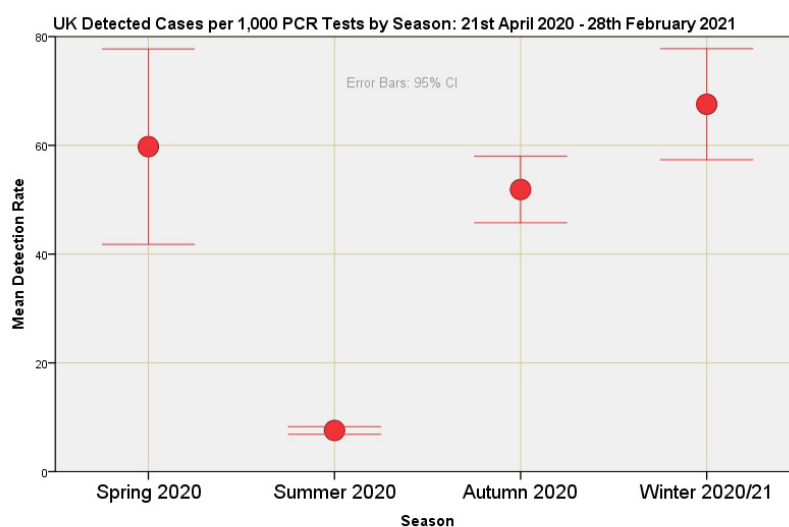
## Parrot Talk

With the UK authorities flapping their wings and squawking "infectious new strain! Infectious new strain!", and with all the other parrots in the mainstream and social media jungle joining in, I thought we might let the official data of Her Majesty's Government stand and roar this fine morning.

What I've done is compute the daily new case detection rate per 1,000 PCR tests and present this as an error bar plot. If a new winter strain emerged and was highly infectious as claimed then we would expect the case detection rate to rocket. Except it hasn't.

Generalised Linear Modelling assuming a Tweedie distribution with maximum likelihood as the scale parameter in Fisher-based estimation revealed that the mean detection rate for winter 2020/21 (67.6 cases per 1,000 PCR tests) did not differ significantly from the rate measured back in spring 2020 (59.8 cases per 1,000 PCR tests), with  $p=0.308$ .

Statistically significant differences emerge for spring vs summer ( $p<0.001$ ), summer vs autumn ( $p<0.001$ ), summer vs winter ( $p<0.001$ ) and autumn vs winter ( $p=0.006$ ). These differences are to be expected from seasonal variation alone. In conclusion there is no evidence for the emergence of a novel, highly infectious UK super-strain.



## Thought Piece #1

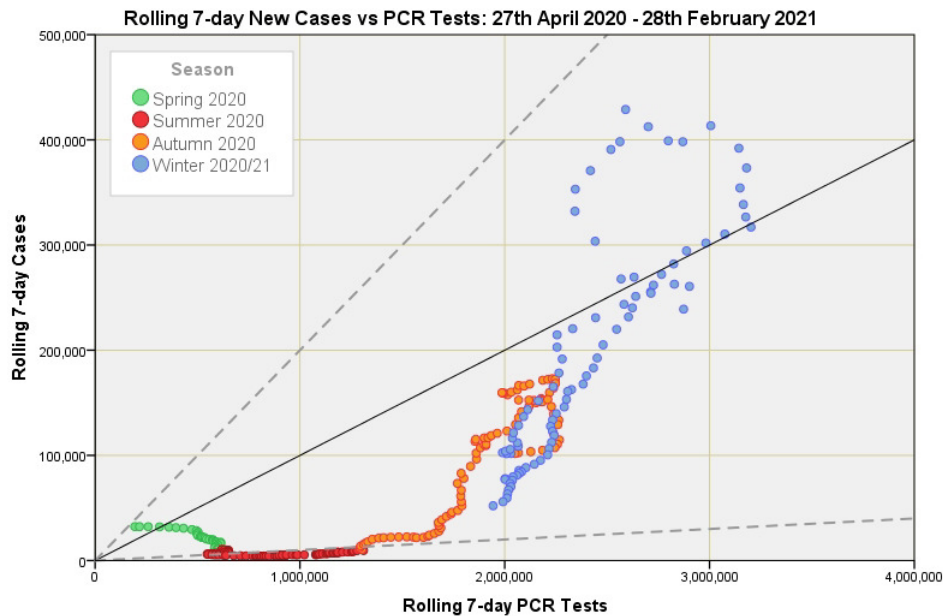
Whilst waiting for my tea to brew I fancied conjuring this thought piece. There are administrative delays in PCR testing and reporting as we may expect so what I have done is compute rolling 7-day case and test totals. In plain English we may think of these as telling us how many cases were detected and how many tests were undertaken in the last week.

I've added three rate lines for eyeballing purposes, the upper dashed line representing 1 in 5, the middle representing 1 in 10 and the lower dashed line representing 1 in 100. The colourful dot snake represents the progression of the disease through the population and through the seasons.

We now see the green tail start against the 1 in 5 rate line (one new case detected for every five PCR tests undertaken), then drop down to the red belly summer period rate of 1 in 100 before climbing into the autumn rates of somewhere between 1 in 100 and 1 in 10. Winter produces the head of the cobra with cases and tests both peaking in December before descending again.

Here are three questions...

1. Given that case detection rate is a measure of the level infection within the general public, why is the level of infection for an alleged novel virus at all seasonal? A novel virus would surely rip through the population regardless of season.
2. Given the UK public flocked to the beaches in droves last summer, why didn't all that evil socialising result in higher levels of infection?
3. Why are the highest levels of infection observed during extended periods of lockdown and following introduction of mandatory mask wearing? Could these policies be the source of the problem?



Source: <https://coronavirus.data.gov.uk/>

## Thought Piece #2

After drinking my tea I fancied conjuring a second thought piece. This time I have considered disease severity by plotting the rolling 7-day count of hospital admissions against the rolling 7-day count for detected cases

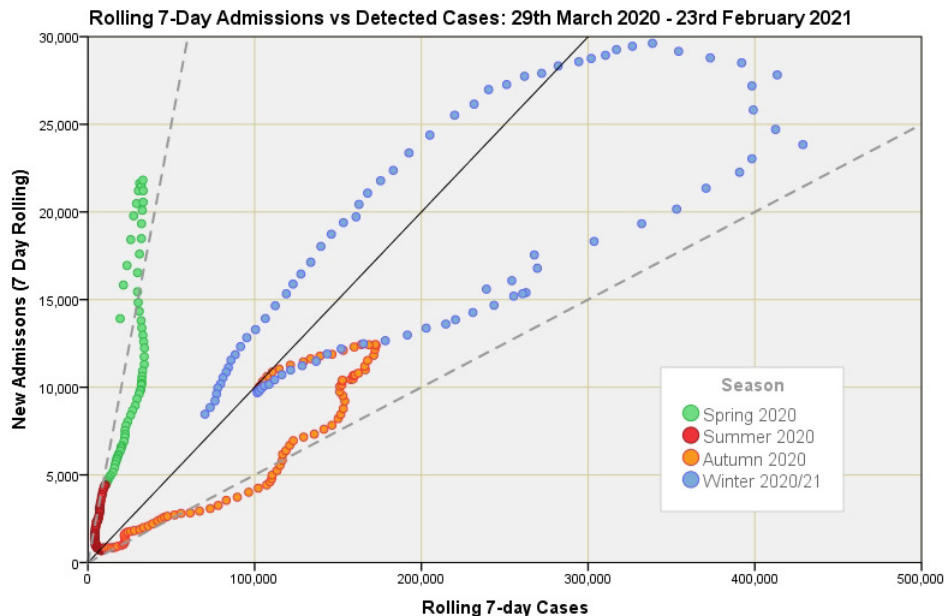
The upper dashed rate line represents 1 in 2 admissions per detected case, the solid middle rate line represents 1 in 10 admissions per detected case and the lower dashed line represents 1 in 20 admissions per detected case.

We now get a feel for what has been really going on despite all those squawking parrots. Disease severity started out pretty grim, with 1 in 2 detected cases being admitted to hospital. It is noteworthy that this grimness continued during the low infection rate summer months.

In contrast, there is a magical transformation for autumn and we see disease severity hug the 1 in 20 rate line before deciding to get deadly again and rise to the 1 in 10 rate line for Winter

Here are three more questions...

1. How can the same novel virus suddenly become less severe in a matter of a week or so, then decide to get more severe during winter?
2. How can a novel virus determine what week it is?
3. Why is HMG beefing on about a nasty new UK strain when disease severity was clearly at its peak during spring and summer 2020?



Source: <https://coronavirus.data.gov.uk/>

### Thought Piece #3

I am hoping my previous two colourful slides have provoked some thought by revealing there is a strange numerical reality that doesn't support what the UK authorities are claiming and hints at liberal shifting of the goalposts to maximise raw numbers at the expense of clinical value. The following slide is an attempt to bring this work together by considering two key rates simultaneously, these being detected cases per 1,000 PCR tests and admissions per detected case. In plain English we may think of these as 'spread' and 'severity'.

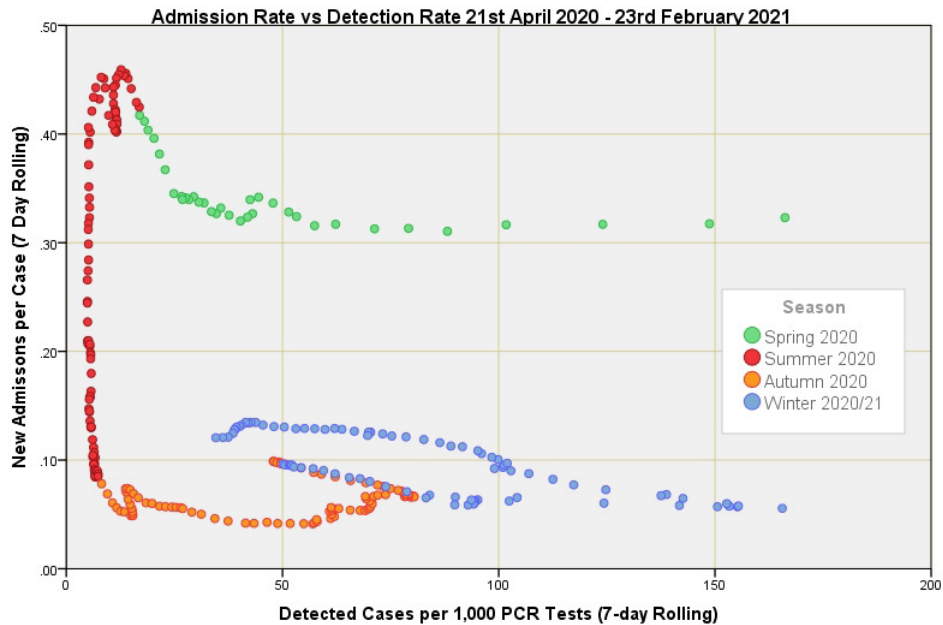
Before we get stuck in it is worth noting just how shy Public Health England are of the humble rate. The only rates I have seen them produce to date are detected cases per 100k population and hospital admissions per 100k population; neither account for differing numbers of tests upon which all hinges! I cannot imagine they cannot afford a band 6 or band 7 Information Officer to remedy this and can only conclude this is a deliberate strategy to maximise numbers for consumption by a largely innumerate public. Let us then remedy the situation ourselves and consider not one but two rates simultaneously!

I confess that this chart fair boggles my brain. If we take Spring of 2020 we see a pretty stable admission rate of around 0.33 admissions per detected case, this translating into one admission per three detected cases. What is interesting is this rate remained the same over a wide range for disease detection. Thus we see that severity remained constant despite evidence of a spreading infection - so far so good.

When we get to Summer of 2020 something extraordinary happens. Firstly, the detection rate (spread) scrapes along at minimum despite all that irresponsible social mingling and beach partying. Secondly, the severity plummets like a stone from 0.45 admissions per detected case to under 0.10 admissions per detected case. Clearly all that fresh air, sunshine, mingling and cold beer is good for us!

Autumn presents us with another mystery, for we see the disease start to spread from around 10 detections per 1,000 PCR tests to around 60 detections per 1,000 PCR tests. This is curious because gone is all that social mingling and in its place we have increasingly severe lockdown and mandatory mask wearing that clearly did absolutely nothing to stop the spread. Also curious is that the Autumn outbreak of 2020 is associated with a much lower disease severity - the lowest since the pandemic began, in fact! And all this in the face of authoritarian warnings of terrible new UK strains to come.

So, we now get to the Winter of our discontent. We can see the disease is spreading but we can also see the severity (in terms of admissions per detected case) is far less than experienced back in the Spring. Standing back and slurping on my cuppa it sure looks to me like a two-pronged epidemic and one that returned with a more mild variant. I have no idea what tea Boris and the gang are drinking - probably China red.



**15th March 2021**

### ***UK All Cause Death Rate***

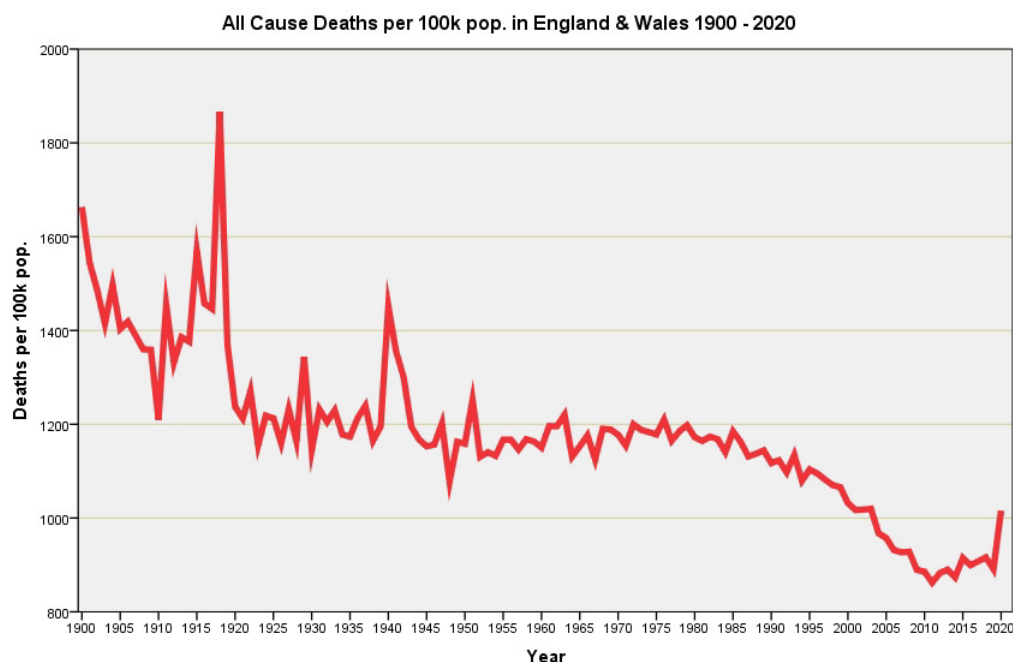
With figures for 2020 slowly making their way into ONS datafiles I thought I'd plot out the first key result, this being the all cause mortality rate for England and Wales in terms of deaths per 100k population. Unlike pretty much every COVID analysis I've seen to date I decided to take this series back to 1900 to give us a better perspective on current events.

The pandemic is indeed making its mark but the shrewd observer will note the 2020 all cause mortality rate of 1015.85 deaths per 100k population puts us on par with rates last seen in 2003 (1019.90 deaths per 100k population).

Whilst wearing our hat of shrewdness let us consider the fragment of time that is 2016 - 2020. If we put a magnifying glass on this we'll produce what appears to be seriously alarming results, these alarming results being the basis of the acclaimed EuroMomo project that computes Z-scores for a pathetically small historic window.

The steady curve downward from the 1970's onward could well be a testament to modern healthcare. If so, then the rise after 2010 may well be the sorry sign of under-funding combined with poor policy-making.

Another notable feature is that the overall health of the nation, in terms of all cause mortality, didn't improve much from 1920 all the way to 1980 or thereabouts. We may ask ourselves how the heck is this possible given dramatic improvements in diagnosis, treatment and clinical care that have been coupled with significant developments in medical technology and a near exponential explosion in pharmaceuticals.



Source: Office for National Statistics

16th March 2021

### ***Pulling A Fast One***

Whilst preparing data for importing into my stats package I've noted a fast one that has been pulled by ONS regarding weekly respiratory death counts. Up to 7th Jan 2021 weekly respiratory causal deaths ('causal' in this sense meaning an ICD10 code in the range J00-J99 entered onto the first section of the death certificate) were included in a row directly below certified COVID deaths.

With the figures in that row dwindling I see that in the spreadsheet covering the period 8th Jan onward the respiratory row has vanished altogether and a new table added to the spreadsheet giving two rows for respiratory death, one with figures much larger than the other.

To maintain historic consistency it is the bottom row we must use but what is the betting that PHE, politicians and the press start quoting those beefy numbers from the top row in attempt to disguise the situation?

|                                                                                                                                           |           |           |           |           |   |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|---|
| <a href="#">Contents</a>                                                                                                                  |           |           |           |           |   |
| <b>Weekly provisional figures on deaths registered in England and Wales, for selected causes of death</b> <sup>1,2,3,4,5,6,7,8</sup>      |           |           |           |           |   |
| <i>Note that up-to-date counts of the total numbers of deaths involving coronavirus (COVID-19) are published by Public Health England</i> |           |           |           |           |   |
| <a href="#">Footnotes</a>                                                                                                                 |           |           |           |           |   |
| <b>Week number</b>                                                                                                                        | 1         | 2         | 3         | 4         |   |
| <b>Week ended</b>                                                                                                                         | 08-Jan-21 | 15-Jan-21 | 22-Jan-21 | 29-Jan-21 | 0 |
| <b>Deaths by cause</b> <sup>1,2,3,4,5</sup>                                                                                               |           |           |           |           |   |
| <i>Note: deaths may be counted in more than one cause category, for example a death may have an underlying cause of COVID-19 but</i>      |           |           |           |           |   |
| <b>Diseases of the respiratory system (J00-J99)</b>                                                                                       |           |           |           |           |   |
| Deaths involving respiratory disease (any mention on the death certificate)                                                               | 7,025     | 7,497     | 7,837     | 7,816     |   |
| <i>of which, deaths due to respiratory disease (underlying cause)</i>                                                                     | 1,262     | 1,199     | 1,079     | 1,058     |   |
| <b>Influenza and pneumonia (J08-J18)</b>                                                                                                  |           |           |           |           |   |
| Deaths involving influenza and pneumonia (any mention on the death certificate)                                                           | 4,649     | 5,273     | 5,696     | 5,719     |   |
| <i>of which, deaths due to influenza and pneumonia (underlying cause)</i>                                                                 | 380       | 381       | 330       | 298       |   |
| <b>COVID-19 (U07.1, U07.2, U09.9, U10.9)</b>                                                                                              |           |           |           |           |   |
| Deaths involving COVID-19 (any mention on the death certificate)                                                                          | 6,057     | 7,245     | 8,422     | 8,433     |   |
| <i>of which, deaths due to COVID-19 (underlying cause)</i>                                                                                | 5,367     | 6,510     | 7,592     | 7,610     |   |



## Pulling A fast One - Again!

With my head in the ONS weekly datafiles I've noticed another sleight of hand. In the UK the official death certificate sanctioned by the Births And Deaths Registration Act 1953 records the cause of death under section I. Under section II a physician or coroner may enter...

*'Other significant conditions contributing to the death but not related to the disease or condition causing it'*

...in the trade we call these co-morbidities. What the ONS have been doing is counting primary cause for respiratory conditions (section I) but counting both primary cause and co-morbidities (sections I & II) for COVID stats i.e. they have been comparing apples to pears.

To compare apples with apples or pears with pears we either have to count section I entries alone or section I & II entries together for both COVID and non-COVID respiratory conditions if we want to compare the incidence of both.

Given this is the ONS this cannot possibly be a mistake. The upshot is that COVID figures up to 7th January 2021 have been inflated wrt non-COVID respiratory conditions. I shall be attempting to unravel this deceit and get some decent analysis out for all to see.

Weeks: 1 to 4 (Note: 5 to 10 are not shown as the data for these weeks has not yet been registered)

| Week number                                                                                                     | 1         | 2         | 3         | 4         |
|-----------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|
| Week ended                                                                                                      | 03-Jan-20 | 10-Jan-20 | 17-Jan-20 | 24-Jan-20 |
| Total deaths, all ages                                                                                          | 12,254    | 14,058    | 12,990    | 11,856    |
| Total deaths: average of corresponding week over the previous 5 years <sup>1, 10, 11</sup> (England and Wales)  | 12,175    | 13,822    | 13,216    | 12,760    |
| Total deaths: average of corresponding week over the previous 5 years <sup>1, 10, 11</sup> (England)            | 11,412    | 12,933    | 12,370    | 11,933    |
| Total deaths: average of corresponding week over the previous 5 years <sup>1, 10, 11</sup> (Wales)              | 756       | 856       | 812       | 802       |
| Note: Deaths could possibly be counted in both causes presented. If a death had an underlying respiratory cause |           |           |           |           |
| Deaths by cause <sup>2,3,4,5</sup>                                                                              |           |           |           |           |
| Deaths where the underlying cause was respiratory disease (ICD-10 J00-J99)                                      | 2,140     | 2,476     | 2,189     | 1,893     |
| Deaths where COVID-19 was mentioned on the death certificate (ICD-10 U07.1 and U07.2)                           | 0         | 0         | 0         | 0         |

## Goal Posts Shifting Again

Just caught sight of note 5 down in the ONS weekly COVID deaths spreadsheet. Here it is cut and pasted...

*From week ending 26th February 2021 (week8) new ICD-10 codes for COVID-19 issued by the World Health Organisation (WHO) have been implemented for deaths involving COVID-19. The new codes are U09.9 (Post-COVID condition, where the acute COVID had ended before the condition immediately causing death occurred) and U10.9 (Multisystem inflammatory syndrome associated with COVID-19 (also called Kawasaki-like syndrome), a specific, uncommon effect of COVID-19 in children). These are in addition to the existing codes of U07.1 (COVID-19, virus identified) and U07.2 (COVID-19, virus not identified, i.e. COVID-19 stated to be unconfirmed or suspected).*

..."New ICD10 codes for COVID-19" mean they've expanded the definition of what will now count as COVID - this is the first I've heard of this so please spread the news! The upshot is that these two new additional definitions will have the effect of bolstering numbers.

They are going to count medical conditions without ascertaining through case-controlled, propensity adjusted retrospective observational study whether these are related to COVID or not - simply because WHO says so. Some of these may well be due to COVID but they may also be due to response to treatment (iatrogenic), and some may well be due to opportunistic pathogens that lurk in all hospitals. Without proper study we have absolutely no idea but this is par for the course these days!

Mention of the "Kawaski-like syndrome" is interesting because if we get down to the medical nitty gritty much of COVID could be coded as 'COVID-like'. Those who have understood the DDT=>polio as opposed to virus=>polio causal chain will see where this is heading.

[https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datalist?sortBy=release\\_date&query=&filter=datasets&fromDateDay=&fromDateMonth=&fromDateYear=&toDateDay=&toDateMonth=&toDateYear=&size=50](https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datalist?sortBy=release_date&query=&filter=datasets&fromDateDay=&fromDateMonth=&fromDateYear=&toDateDay=&toDateMonth=&toDateYear=&size=50)

## Fudging the 'Flu

With 582 weekly records for respiratory death in England & Wales in my pot it didn't take much to turn the handle and reveal what many folk have been claiming - that seasonal 'flu and respiratory disease has been coded as COVID.

Just a reminder that what we mean by respiratory death is defined by a coded medical diagnosis in the range J00 - J99 according to the International Classification of Diseases, Tenth Revision (ICD-10). This includes everything from asthma to pneumonia via COPD, emphysema and many other chronic and acute conditions. This diagnosis has to be made by a qualified medical practitioner and recorded in section I of the death certificate (cause of death) i.e. it is a condition directly leading to death rather than a co-morbidity.

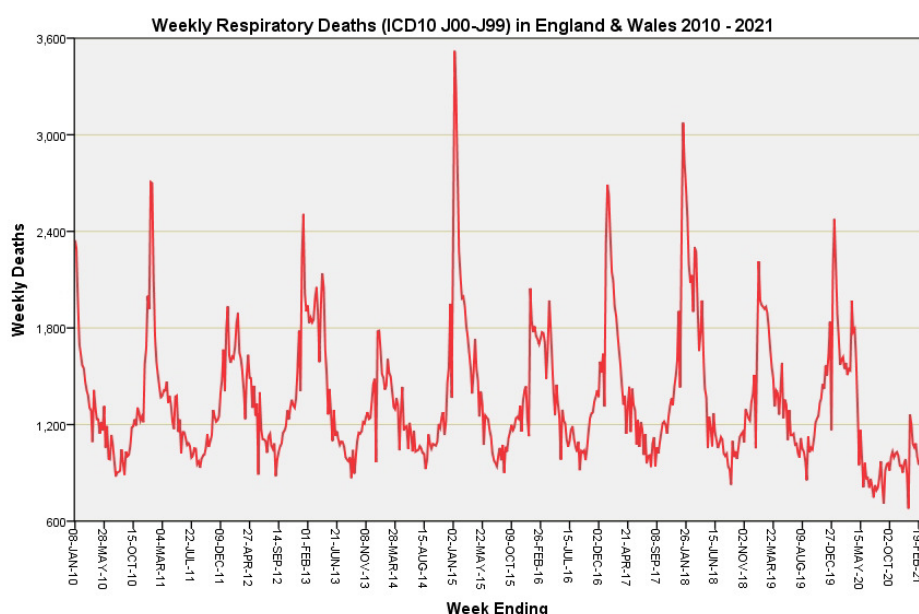
In this first slide I have simply plotted out the weekly death counts so we get a feel for the striking seasonality of respiratory death along with its pre-COVID natural variation. Something clearly is amiss from the week ending 15th May 2020 onward in that seasonal respiratory death for 2020/21 has magically disappeared. Biologically speaking this is simply not possible for 'flu strains are always with us to a greater or lesser extent; besides which ALL respiratory conditions tend to worsen in the winter months and always have in these small, damp islands, as witnessed by the data series.

In the second slide I have provided clarity by analysing the mean weekly death count by month, adding error bars representing the 95% confidence interval to give a feel of the spread of values. We now see that in March 2020 mean weekly respiratory death pretty much overlapped with the overall mean for 2010 - 2019 ( $p=0.621$ ; Mann-Whitney). In April 2020 we see a blue bump rising above the red 2020 - 2019 mean rate that indicates a statistically significant nastier-than-normal respiratory season ( $p=0.024$ ; Mann-Whitney). This is an important finding: we got hit by more than just COVID.

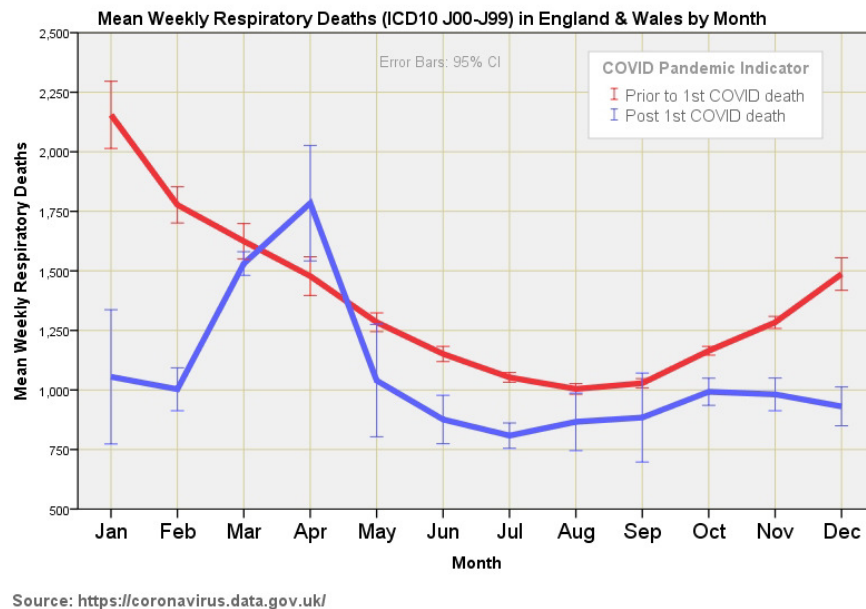
In May 2020 the data authorities clearly got into gear on the coding front and seasonal respiratory death starts to fall away, this being highly statistically significant ( $p=0.009$ ; Mann-Whitney). The key thing to note here is that this is not medics fudging the books but data management teams blindly following directives from WHO. I shall remind you of the WHO's own wording on the matter...

*"With reference to section 4.2.3 of volume 2 of ICD-10, the purpose of mortality classification (coding) is to produce the most useful cause of death statistics possible. Thus, whether a sequence is listed as 'rejected' or 'accepted' may reflect interests of importance for public health rather than what is acceptable from a purely medical point of view. Therefore, always apply these instructions, whether they can be considered medically correct or not."*

From May onward it just gets silly with every single month hitting statistical significance at  $p<0.01$  and beyond for differences in mean weekly respiratory deaths pre- and post-COVID. The prize goes to January 2021 whose statistical significance hits an incredible  $p=0.000003$ . In plain English this equates to a 1 in 333,333 chance that this difference may have come about by natural variation. Sorry Dr whatsyourname from Public Health England but you are either talking out of your arse or are being told to do so. In the next episode I'll provide an estimate of how many seasonal respiratory deaths have been attributed to COVID - stay tuned!



Source: Office for National Statistics



## Big Ben

In a previous post I wrote...

*Folk (including bods at PHE) are reporting a magical drop in influenza deaths during the 2020/21 'flu season and I'll be determining whether this variation could have occurred naturally or whether statistical analysis suggests a fudge the size of Big Ben.*

...we now know we are looking at a fudge the size of Big Ben, but how big is Ben? One way to estimate the size of the fudge is to calculate the 10-year average for respiratory death for the period 2010 - 2019 for each week of the year and subtract from these values the corresponding observed counts of respiratory death for 2020 and 2021 for the same week (a technique widely used by ONS). The balance we end up with is an estimate of the excess difference generated through clinical mis-coding.

When we do this for the period defined by 2020/week 19 (week beginning 2nd May 2020) right through to 2021/week 8 (week beginning 20th Feb 2021) we find a total of 16,794 mis-coded respiratory deaths parading as COVID, this equating to an average of 390.6 mis-coded deaths per week.

During this same time frame the COVID death count was purported to be 97,626 when in actual fact it was more like 80,832 (83%) - still a lot but the sort of lot that is going to make far more clinical sense than WHO's farting around with coding in the "interests of importance for public health" - by this do they mean nonsensical clinical data are good for us?

But Big Ben hasn't yet chimed midnight! Those 80,832 more-likely-to-be-genuine COVID deaths aren't necessarily causal COVID deaths because they include clinical coding from parts I (causal) and II (co-morbid) parts of the death certificate.

In order to compare apples with apples we have to separate that tangle out so we may compare causal respiratory death with causal COVID death; as it stands we are comparing causal respiratory death with causal and comorbid COVID death. It's the same old 'with' not 'of' argument come to bite us in the bum again. For my next trick I shall try and pull the causal white rabbit out of the hat.

## Corrected Causal First Stab

With estimates for mis-coding of causal respiratory disease death in my toolbox I can now pull down the ONS weekly deaths spreadsheet and locate the tab headed 'Weekly figures by cause'. Re-formatting, a splash of colour and adjustment of figures using my estimates yields this first glimpse of comparative causality using a level playing field.

After breakfast I'll get my sleeves rolled up and start doing some serious statistical modelling of time series data to confirm what we observe: that death from respiratory disease as a co-morbidity continues to outstrip death from COVID as a co-morbidity (a fancy word for 'with') by a factor of x1.54 but COVID, as casual factor, outstrips respiratory conditions by a factor of x2.29. This is a darn interesting finding.

We should note the extended definition for COVID, which now includes U09.9 (Post COVID-19 condition, unspecified) and U10.9 (Multisystem inflammatory syndrome associated with COVID-19, unspecified) - case counts will rise as a direct result so these tables are already infected with inconsistency and the playing field becoming bumpy once more!

[https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datalist?sortBy=release\\_date&query=&filter=datasets&fromDateDay=&fromDateMonth=&fromDateYear=&toDateDay=&toDateMonth=&toDateYear=&size=50](https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datalist?sortBy=release_date&query=&filter=datasets&fromDateDay=&fromDateMonth=&fromDateYear=&toDateDay=&toDateMonth=&toDateYear=&size=50)

| Note: deaths may be counted in more than one cause category, for example a death may have an underlying cause of COVID-19 but also have influenza and pneumonia mentioned as a contributory cause of death. |            |                                                                             |                                                                |                                                                  |                                                     |                                            |                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------|--------------------------------------|
| Deaths by cause 1,2,3,4,5                                                                                                                                                                                   |            |                                                                             |                                                                |                                                                  |                                                     |                                            |                                      |
|                                                                                                                                                                                                             |            | Diseases of the respiratory system (J00-J99)                                |                                                                | COVID-19 (U07.1, U07.2, U09.9, U10.9)                            |                                                     |                                            |                                      |
| Week number                                                                                                                                                                                                 | Week ended | Deaths involving respiratory disease (any mention on the death certificate) | of which, deaths due to respiratory disease (underlying cause) | Deaths involving COVID-19 (any mention on the death certificate) | of which, deaths due to COVID-19 (underlying cause) | Co-morbidity Factor (Respiratory to COVID) | Casual Factor (COVID to Respiratory) |
| 1                                                                                                                                                                                                           | 08/01/2021 | 7,937                                                                       | 2,174                                                          | 5,145                                                            | 4,455                                               | 1.54                                       | 2.05                                 |
| 2                                                                                                                                                                                                           | 15/01/2021 | 8,753                                                                       | 2,455                                                          | 5,989                                                            | 5,254                                               | 1.46                                       | 2.14                                 |
| 3                                                                                                                                                                                                           | 22/01/2021 | 8,941                                                                       | 2,183                                                          | 7,318                                                            | 6,488                                               | 1.22                                       | 2.97                                 |
| 4                                                                                                                                                                                                           | 29/01/2021 | 8,756                                                                       | 1,998                                                          | 7,493                                                            | 6,670                                               | 1.17                                       | 3.34                                 |
| 5                                                                                                                                                                                                           | 05/02/2021 | 7,842                                                                       | 1,886                                                          | 6,517                                                            | 5,718                                               | 1.20                                       | 3.03                                 |
| 6                                                                                                                                                                                                           | 12/02/2021 | 6,839                                                                       | 1,799                                                          | 4,890                                                            | 4,234                                               | 1.40                                       | 2.35                                 |
| 7                                                                                                                                                                                                           | 19/02/2021 | 5,970                                                                       | 1,760                                                          | 3,270                                                            | 2,686                                               | 1.83                                       | 1.53                                 |
| 8                                                                                                                                                                                                           | 26/02/2021 | 5,238                                                                       | 1,772                                                          | 2,122                                                            | 1,677                                               | 2.47                                       | 0.95                                 |
| Mean values                                                                                                                                                                                                 |            | 7,534                                                                       | 2,003                                                          | 5,343                                                            | 4,648                                               | 1.54                                       | 2.29                                 |

## Changes to COVID Coding

Up to now two emergency ICD-10 codes have been used to code COVID cases - U07.1 (COVID-19, virus identified) and U07.2 (COVID-19, virus not identified). Please be aware that a raft of new emergency codes are going to be added (see link to CDC document below) that may bump COVID case counts like crazy. Whenever you see claims of vast numbers in future please do ask what ICD-10 coding frame has been used to ensure historical consistency.

We should also note that these new codes will hide the emergence of adverse reactions to vaccines if these mimic Kawasaki-like syndrome, induce a cytokine storm or induce inflammatory conditions in children (vaccines in development).

With any luck the public will be given access to U12.9 (COVID-19 vaccines causing adverse effects in therapeutic use, unspecified) though I doubt this data will be made available even through FOI.

[https://cdn.who.int/media/docs/default-source/classification/icd/covid-19/covid-19-coding-updates-3-4-combined.pdf?sfvrsn=39197c91\\_3](https://cdn.who.int/media/docs/default-source/classification/icd/covid-19/covid-19-coding-updates-3-4-combined.pdf?sfvrsn=39197c91_3)

## Two Months To Determine Safety

Extract from the UK government document entitled 'REG 174 INFORMATION FOR UK HEALTHCARE PROFESSIONALS'. The original document was captured 7/12/20 and is the basis upon which Pfizer/Moderna Vaccine BNT162b2 rollout was agreed.

The latest version of the document focuses on the AstraZeneca product revises the time as follows:- "The median duration of follow-up in the COVID-19 Vaccine AstraZeneca group was 105 days post-dose 1, and 62 days post-dose 2

[https://web.archive.org/web/20201207114708/https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/941452/Information\\_for\\_healthcare\\_professionals.pdf](https://web.archive.org/web/20201207114708/https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/941452/Information_for_healthcare_professionals.pdf)

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/941452/Information\\_for\\_healthcare\\_professionals.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/941452/Information_for_healthcare_professionals.pdf)

### 4.8 Undesirable effects

#### Summary of safety profile

The safety of COVID-19 mRNA Vaccine BNT162b2 was evaluated in participants 16 years of age and older in two clinical studies conducted in the United States, Europe, Turkey, South Africa, and South America. Study BNT162-01 (Study 1) enrolled 60 participants, 18 through 55 years of age. Study C4591001 (Study 2) enrolled approximately 44,000 participants, 12 years of age or older. In Study 2, a total of 21,720 participants 16 years of age or older received at least one dose of COVID-19 mRNA Vaccine BNT162b and 21,728 participants 16 years of age or older received placebo. Out of these, at the time of the analysis, 19,067 (9531 COVID-19 mRNA Vaccine BNT162b2 and 9536 placebo) were evaluated for safety 2 months after the second dose of COVID-19 mRNA Vaccine BNT162b2.

## ***Pfizer Trial Exclusion Criteria***

There's lots of hand waving by important people in the UK right now in the wake of folk waking up to possible vaccine side effects, with shouts of "extensively tested! rigorous safety testing! extreme safety checks!" and more. We've already seen rollout was based on just a two month follow-up window for adverse reactions so let us now look at the sort of folk who were excluded from the safety trial upon which all hangs...

### **EXCLUSION CRITERIA:**

- Other medical or psychiatric condition including recent (within the past year) or active suicidal ideation/behavior or laboratory abnormality that may increase the risk of study participation or, in the investigator's judgment, make the participant inappropriate for the study.
- Phases 1 and 2 only: Known infection with human immunodeficiency virus (HIV), hepatitis C virus (HCV), or hepatitis B virus (HBV).
- History of severe adverse reaction associated with a vaccine and/or severe allergic reaction (eg, anaphylaxis) to any component of the study intervention(s).
- Receipt of medications intended to prevent COVID 19.
- Previous clinical (based on COVID-19 symptoms/signs alone, if a SARS-CoV-2 NAAT result was not available) or microbiological (based on COVID-19 symptoms/signs and a positive SARS-CoV-2 NAAT result) diagnosis of COVID 19
- Phase 1 only: Individuals at high risk for severe COVID-19, including those with any of the following risk factors:
  - Hypertension
  - Diabetes mellitus
  - Chronic pulmonary disease
  - Asthma
  - Current vaping or smoking
  - History of chronic smoking within the prior year
  - BMI >30 kg/m<sup>2</sup>
- Anticipating the need for immunosuppressive treatment within the next 6 months
- Phase 1 only: Individuals currently working in occupations with high risk of exposure to SARS-CoV-2 (eg, healthcare worker, emergency response personnel).
- Immunocompromised individuals with known or suspected immunodeficiency, as determined by history and/or laboratory/physical examination.
- Phase 1 only: Individuals with a history of autoimmune disease or an active autoimmune disease requiring therapeutic intervention.
- Bleeding diathesis or condition associated with prolonged bleeding that would, in the opinion of the investigator, contraindicate intramuscular injection.
- Women who are pregnant or breastfeeding.
- Previous vaccination with any coronavirus vaccine.
- Individuals who receive treatment with immunosuppressive therapy, including cytotoxic agents or systemic corticosteroids, eg, for cancer or an autoimmune disease, or planned receipt throughout the study.
- Phase 1 only: Regular receipt of inhaled/nebulized corticosteroids.
- Receipt of blood/plasma products or immunoglobulin, from 60 days before study intervention administration or planned receipt throughout the study.
- Participation in other studies involving study intervention within 28 days prior to study entry and/or during study participation.
- Previous participation in other studies involving study intervention containing lipid nanoparticles.
- Phase 1 only: Positive serological test for SARS-CoV-2 IgM and/or IgG antibodies at the screening visit.
- Phase 1 only: Any screening hematology and/or blood chemistry laboratory value that meets the definition of a ≥ Grade 1 abnormality.
- Phase 1 only: Positive test for HIV, hepatitis B surface antigen (HBsAg), hepatitis B core antibodies (HBc Abs), or hepatitis C virus antibodies (HCV Abs) at the screening visit.
- Phase 1 only: SARS-CoV-2 NAAT-positive nasal swab within 24 hours before receipt of study intervention.

...how many of these folk are now getting the jab but don't realise folk like them were excluded from the 'safety' study? We may note the official title of this clinical trial (NCT04368728)... *Study to Describe the Safety, Tolerability, Immunogenicity, and Efficacy of RNA Vaccine Candidates Against COVID-19 in **Healthy** Individuals...* there you go - does what it says on the tin!



## Lockdown Deaths

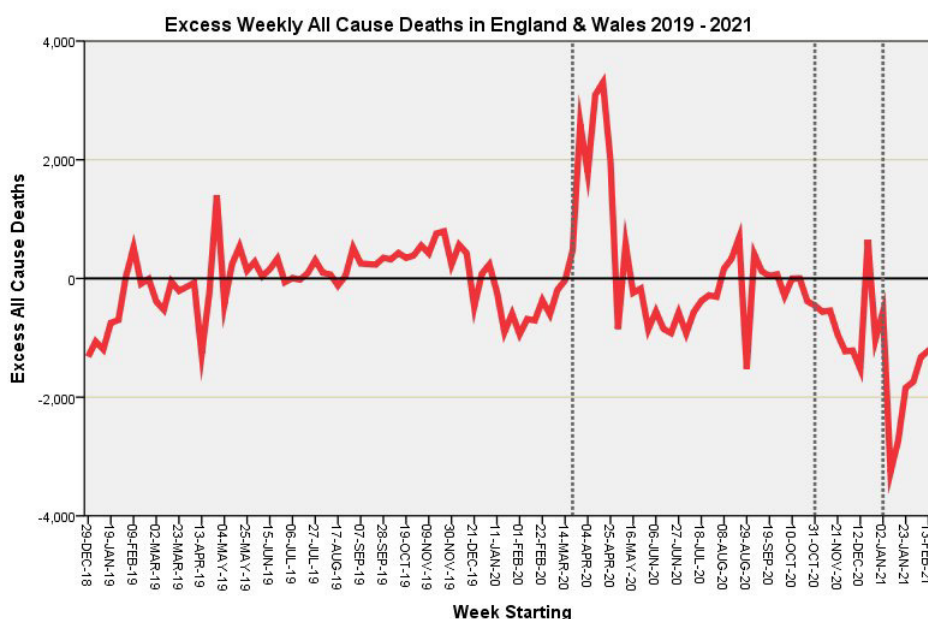
Another thing we can do with 582 ONS weekly records of all cause and COVID deaths is estimate deaths due to lockdown measures (hospital closures, suicides, delayed diagnostics, delayed treatment etc).

The simplest method for doing this is simply subtract COVID deaths from all cause deaths then subtract the prior 5-year average number of deaths for the corresponding week. This will leave us with an estimate for excess weekly deaths.

When we do this an interesting picture emerges. The first period of national lockdown from 26th March 2020 to the phased re-opening of schools on 1st June 2020 corresponds to a whopping great spike in excess deaths over and above the 5-year average. This is government policy killing people, plain and simple. At its peak this first lockdown period saw an estimated 13,206 accumulated lockdown deaths.

In stark contrast, during the third period of national lockdown starting 6th January 2021, we see a marked saving in excess deaths. What did HMG get so wrong during the first lockdown period?

As more data comes my way I shall be refining these crude estimates further - sticking in my mind like a sore thumb is that hugely negative excess of January 2021. Either lockdown has magically transformed into something beneficial or there is something very wrong with how COVID deaths are counted.



18th March 2021

## Trouble At Mill

My recent attempt at estimating excess death due to lockdown policies left me with a sore thumb in my mind and I suggested that lockdown has either magically transformed into something beneficial or there is something very wrong with how COVID deaths are counted.

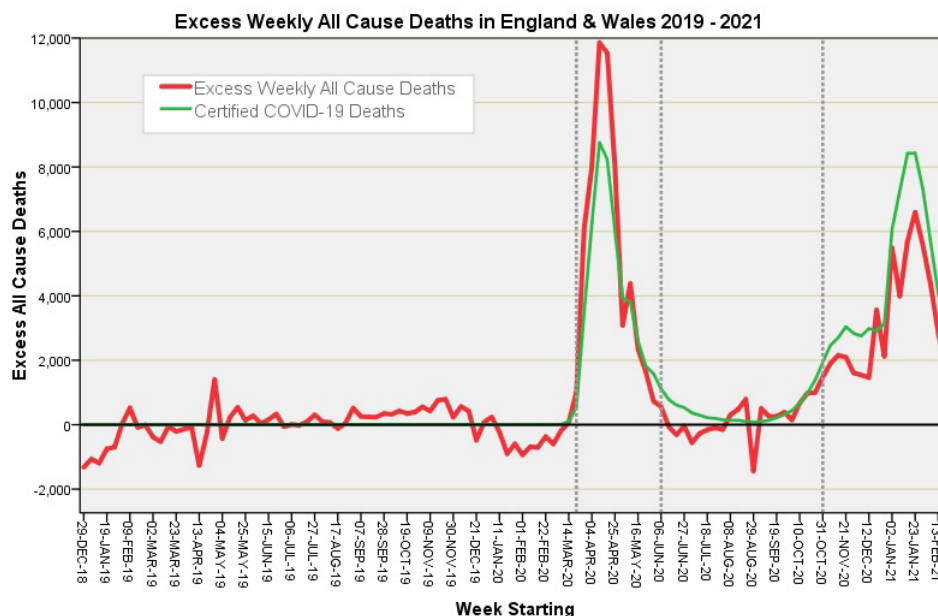
To unpick this I went back to calculating excess deaths as the number of observed all cause deaths each week minus the prior 5-year average for that week. The residual will then reveal excess deaths due to COVID as well as lockdown policy.

What transpired blew my mind. In the plot below you'll see COVID deaths acting as a subset of excess weekly deaths as expected, but only for the period 14 March 2020 - 16 May 2020. After this we start to see more COVID deaths than there are excess deaths - an impossibility by definition!

This brings us back to the topic of causality and my earlier post pointing out that COVID mortality stats are based on counting both section I (causal) and section II (co-morbidities) of the death certificate.

According to the WHO this shouldn't matter for they claim there is very little difference, in that nearly all COVID deaths are allegedly causal. A quick squint at the latest ONS figures reveals 88% of certified COVID deaths are causal. Really? Let's put this to the test... stay tuned!





Source: <https://coronavirus.data.gov.uk/>

## Death Certification Fiasco

In 'Trouble At Mill' we discovered an irregularity in that the number of weekly certified COVID deaths exceeded the number of weekly total excess deaths from May 2020 onward. It was pointed out that this was due to COVID death stats being derived from both section I (causal) and section II (co-morbidities) of the death certificate.

In their latest offering of weekly death stats ONS provide a unique table entitled 'Weekly figures by cause' that provides a breakdown of section I and section II figures for COVID. What I've done is bung these into my spreadsheet and redrawn the previous graph.

Proof of the pudding is in the eating they say and here is some pretty strong proof that not all is well with the death certification process. Over on the right of the plot we see certified causal (section I) COVID death counts exceeding the excess weekly all cause deaths!

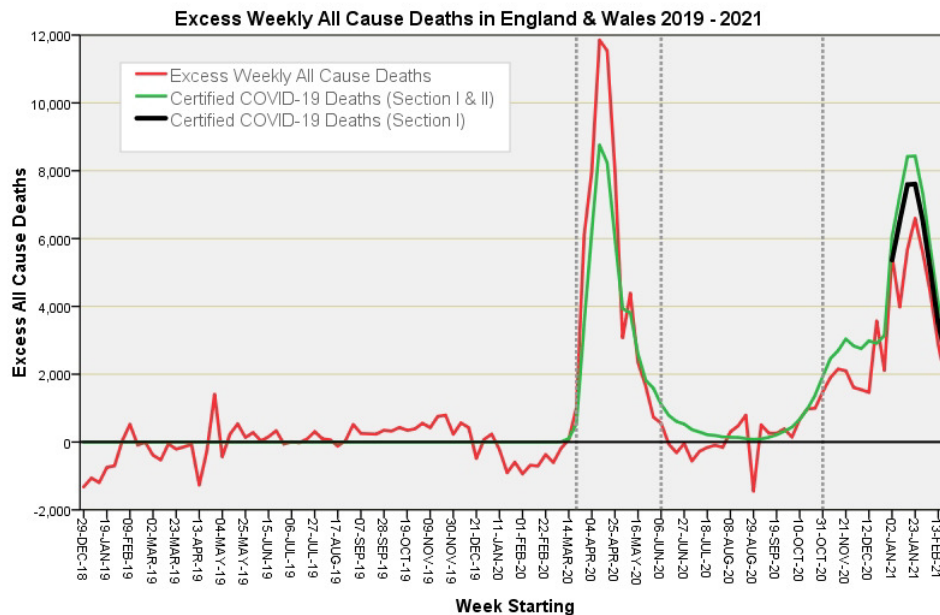
A quick stab at my trusty hand-held calculator reveals that, for weeks 1 to 8 of 2021, the total all cause excess death count comes to 36,345 deaths, whereas the allegedly causal COVID count comes to 44,599 deaths. This is 8,254 deaths more than is possible by definition and I offer this as proof that the death certification process is more than a little wonky.

In terms of factor increase those telling first eight weeks of 2021 reveal an overall mean inflation of x1.25 of causal COVID deaths over and above what we would expect from historic rates. This equates to a 125% causal count which, in plain English, means that for every four genuinely causal COVID deaths the authorities are generating another causal COVID death by applying WHO certification guidelines - this may be a gross underestimate of just how much data manipulation is taking place.

I cannot imagine any physician getting involved in this but I would not be at all surprised to learn that death certification stats are being deliberately altered by those suits who enter them on the system, or perhaps by an automated algorithm in the electronic system itself. An audit of the death certification process is strongly recommended, and I shall remind folk yet again of what the WHO recommends as regards death certification...

*"With reference to section 4.2.3 of volume 2 of ICD-10, the purpose of mortality classification (coding) is to produce the most useful cause of death statistics possible. Thus, whether a sequence is listed as 'rejected' or 'accepted' may reflect interests of importance for public health rather than what is acceptable from a purely medical point of view. Therefore, always apply these instructions, whether they can be considered medically correct or not."*

... there it is in black and white!



Source: <https://coronavirus.data.gov.uk/>

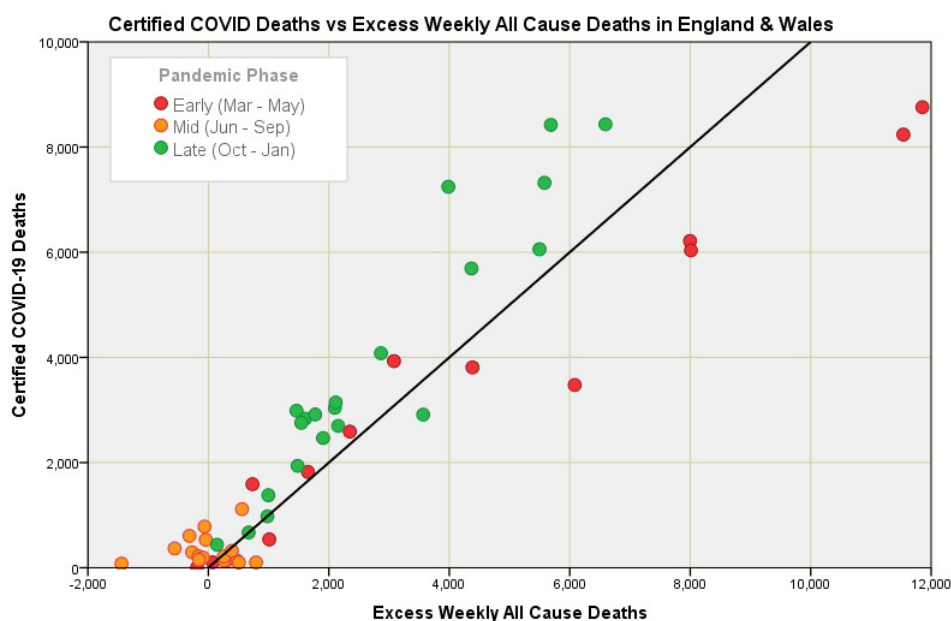
## Death Certification Bias

For those who like scatterplots here is a cracker! I've plotted out certified COVID deaths against excess weekly all cause deaths in England and Wales for March 2020 onward, and have colour-coded the points according to pandemic phase. The black line represents the identity function  $y=x$ . Any point lying above this line is telling us there were more certified COVID deaths than weekly excess deaths - this being impossible by definition!

We now see a pattern emerging. In the early phase of the pandemic (March - April) the red blobs sit well below the identity function or pretty close to it. This makes sense. In the mid phase (June - September) the orange blobs gather around the origin as folk enjoyed a decent summer with deaths. This makes sense.

What doesn't make sense is that when the pandemic came back, as we may expect from anything respiratory and thus seasonal (the much-hyped 'second wave'), we see a scatter of green blobs lying above the identity function. This does not make sense.

What we have here is yet more evidence of strategic 'adjustments' to certification. I shall be using a few fancy statistical modelling tricks to sniff out what has been hidden from the public gaze - stay tuned!



Source: <https://coronavirus.data.gov.uk/>

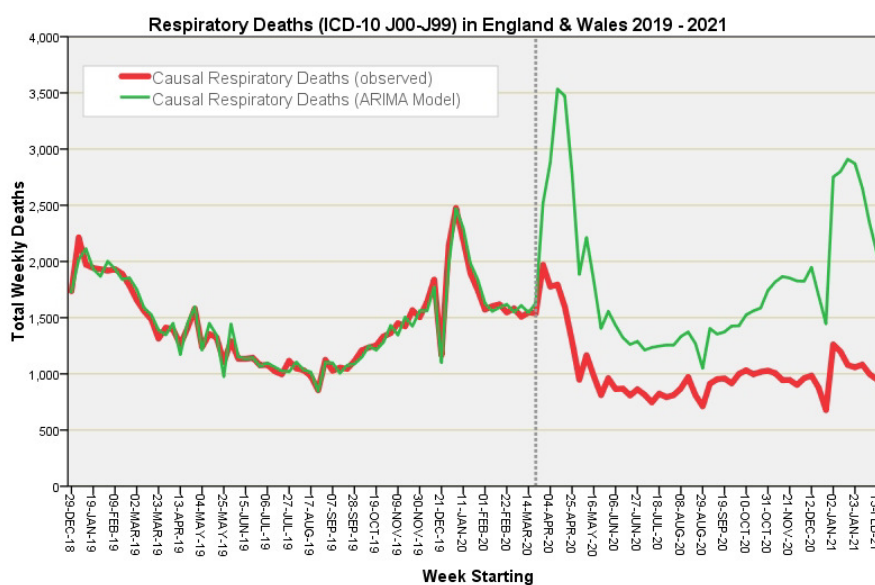
## Respiratory Death ARIMA Model

In my post of yesterday entitled 'Fudging The 'Flu' I revealed the discrepancy between historic respiratory deaths over the period 2010 - 2019 and respiratory deaths as coded during the pandemic under WHO guidelines. We saw a gaping hole the size of Big Ben and gathered fudge was afoot.

This afternoon I rolled out a favourite statistical tool of mine this being ARIMA time series modelling with independent variables. Thus I have been able to successfully model the data series for respiratory deaths from 2010 - 2019, thence to predict what the weekly death count should have been like during the pandemic.

As you can see from the slide below the model performs exceptionally well ( $R\text{-square} = 0.832$ ,  $p < 0.001$ ) in tracking respiratory deaths right up to the start of the pandemic, after which we see a gaping divergence. The difference between the green line and red line are almost certainly mis-coded COVID cases and I will be making adjustments to the data accordingly.

A quick count reveals an astonishing 39,999 missing respiratory causal deaths since the pandemic began. If that is not a gob-smacking statistic I don't know what is!



Source: <https://coronavirus.data.gov.uk/>

## Lockdown Deaths Revisited

With statistical modelling and detective work making better sense of the weekly death datafiles kindly provided by ONS I thought I'd end today's session by going back and producing refined estimates for deaths arising from lockdown policies.

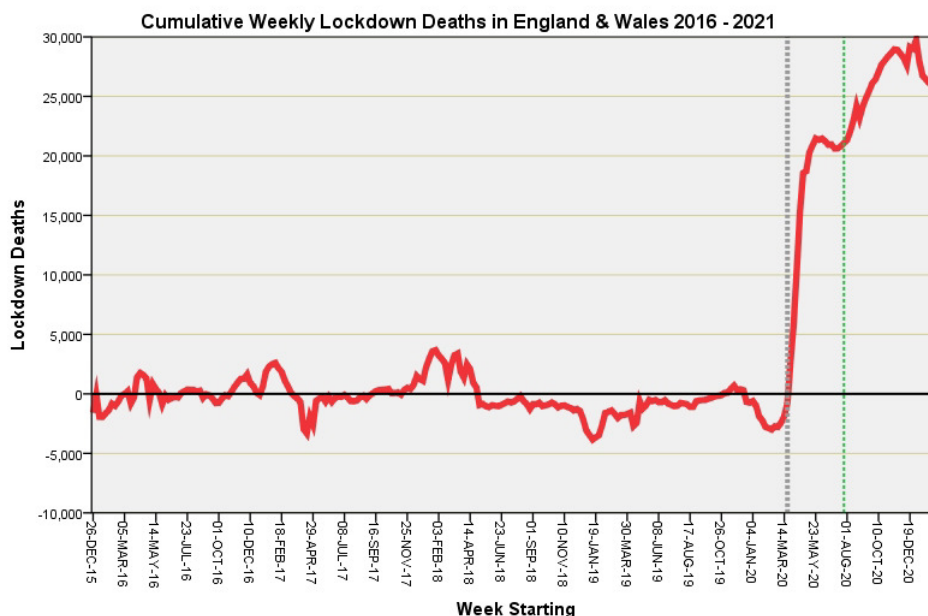
These are the residual deaths we may count once certified causal COVID deaths have been removed from totals, and once the seasonally-adjusted 12-year baseline for periodic natural variation has been removed from totals.

These residual deaths may arise from absolutely any unexpected cause of death but in the midst of draconian lockdown measures, cancellation of clinical services nationwide, rumoured increases in care home deaths and concern over elevated numbers of suicides I'm pretty sure we can pin the horror on the lapels of the Prime Minister, his Cabinet and their advisors.

In the slide below I've taken the series back to 2015 so folk may get a feel for the background noise inherent in the analysis and I've produced a cumulative total so we can see just how bad things have gotten. Things have gotten pretty bad indeed, with the peak value hitting 29,739 lockdown deaths w/b 2nd Jan 2021.

I'm not isolated in declaring such a horror since the universities of Sheffield and Loughborough got there before me, declaring an estimated 21,000 lockdown deaths back in July 2020. I've marked this point with a green line, and we can see my revised analysis pretty much hits the same estimate dead on.

This is a sorry story that is not being told. Lockdown kills as well as the virus and a balance is required in the interests of public health. I don't see evidence of that balance but I do see evidence of political posturing.



Source: <https://coronavirus.data.gov.uk/>

19th March 2021

## Coding Death

A long time ago in a hospital far, far away I was the suit in charge of coding death. Not only did I code death and verify that clinical coders and coroners were coding death correctly but I also ran the monthly mortality and morbidity meetings where every death was scrutinised in detail by the multi-disciplinary team responsible. As a result I was the suit to whom the legal team would come should charges be brought. Death was my specialism.

We've already seen how WHO want our clinicians to code death; here are their words again...

*"With reference to section 4.2.3 of volume 2 of ICD-10, the purpose of mortality classification (coding) is to produce the most useful cause of death statistics possible. Thus, whether a sequence is listed as 'rejected' or 'accepted' may reflect interests of importance for public health rather than what is acceptable from a purely medical point of view. Therefore, always apply these instructions, whether they can be considered medically correct or not."*

...they want our clinicians to throw their training out of the window and label everything COVID regardless of whether this makes medical sense. Ironically, they state this is in the best interests of public health yet this approach trashes everything we need to know about incidence of respiratory and circulatory disorders both as causal and co-morbid factors.

Back in January I asked the ONS how they approached analysing these nonsensical death certificates and was fobbed off with a standard reply. Revealing my credentials and pressing the point I received a more helpful reply from a Senior Customer Service and Data Release Manager. A screenshot of the actual email is attached.

I'd like to draw attention to two sentence fragments:

*For statistical purposes one of the health conditions on the certificate is chosen...*

*...and is worked out according to rules from the World Health Organisation (WHO).*

Thus, if a respiratory condition and COVID are both recorded in section I (causal) of the certificate then COVID alone is chosen to compute the death stats. The sleight of hand doesn't stop there for if we carefully consider the second sentence we see that they 'work out' how to code each certificate regardless of what qualified physicians may have entered i.e. they are applying WHO's rules as they extract information. I'm pretty sure an audit of death certificates will support my accusation.

As time permits I will be using statistical modelling techniques to gradually unravel the COVID story so we may see exactly what happened. Without sound clinical data guiding us all authorities can do is wallow in confectionery and arrive at marshmallow policies and, as every doctor knows, excessive sugar is bad for the health.

From: Health Data <Health.Data@ons.gov.uk>  
 Subject: RE: Deaths involving COVID-19 - Interactive map: Query  
 To: Me <[REDACTED]>  
 Date: 05/01/2021, 17:08

Good afternoon Mr [REDACTED]

ONS data as described here are different from the figures on COVID-19 deaths published on the government's [COVID-19 dashboard](#) which shows 'deaths within 28 days of a positive test'. You can read a blog by Professor John Newton of Public Health England [about the complexities of counting COVID-19 deaths and the different methods used](#).

Our data is derived from the death certificate. The doctor or coroner certifying a death can record more than one health condition or event on the form. The medical certificate of cause of death has two parts, Part 1 contains the sequence of health conditions or events leading directly to death, while Part 2 can contain other health conditions that contributed to the death but were not part of the direct sequence. **For statistical purposes one of the health conditions on the certificate is chosen as the 'underlying cause of death'.** The underlying cause of death is defined as the health condition or event that started the train of events leading to death **and is worked out according to rules from the World Health Organisation (WHO).** COVID-19 is the underlying cause of death in around 92% of deaths where it was mentioned on the death certificate.

You can read in detail about the coding of causes of death and identifying the underlying cause in the [ONS User guide to mortality statistics](#) and the [WHO International Classification of Diseases \(ICD-10\) instruction manual](#).

When we say that a death 'involved' COVID-19, we mean that COVID-19 was mentioned anywhere on the death certificate, possibly along with other health conditions, not necessarily as the underlying cause of death. When we say that a death was 'due to' COVID-19, we mean that COVID-19 was the underlying cause of death, because it was either the only health condition mentioned on the death certificate, or it was the one that started the train of events leading to death. COVID-19 is the underlying cause of death in around 92% of deaths where it was mentioned on the death certificate.

You can see how these different categories are used in the [ONS Monthly mortality analysis](#).

Kind regards  
 Anne

**Anne Baker** | Senior Customer Service and Data Release Manager | Health Analysis and Pandemic Insight | Public Policy Analysis  
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[www.ons.gov.uk](http://www.ons.gov.uk) | @ONS

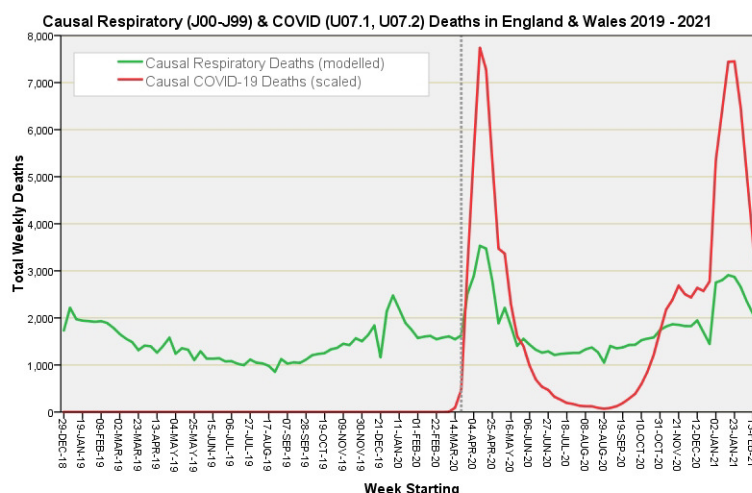
## Toward Understanding

In my post entitled 'Coding Death' I tore into the gross stupidity exhibited by both WHO and ONS in setting aside medical rigour and deciding to track COVID and only COVID for reasons of "public health". Public health my arse - try telling that to patients with bacterial pneumonia whose clinical outcomes you wish to track over time in order to improve healthcare!

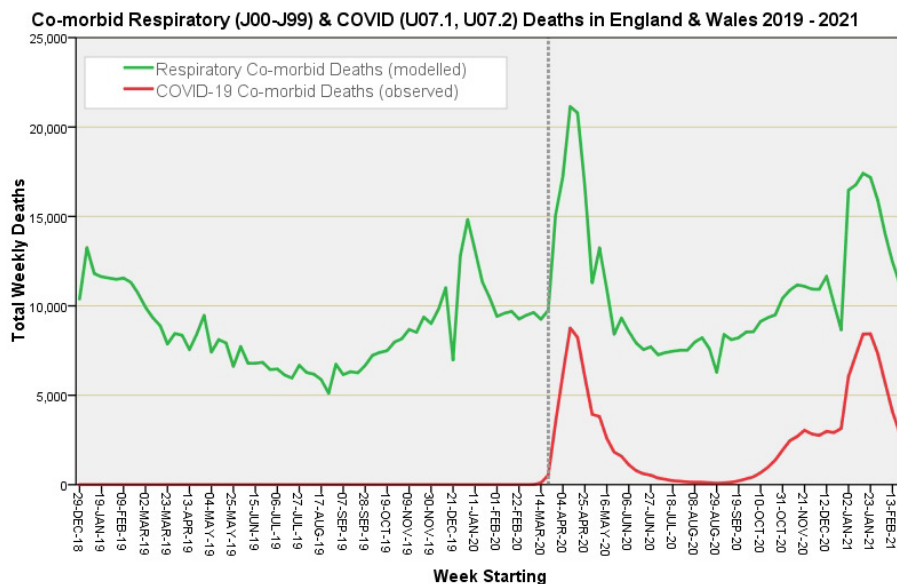
After thrashing about with statistical modelling in an attempt to unpick the damage done by an idiotic coding regime I have finally settled on two slides I have more faith in though, to be honest, I'm not convinced the RT-PCR test, at 45 cycles is doing anything but producing nonsense.

Setting that barrel of worms aside here, then, is my current understanding of how weekly respiratory death stacks up against weekly COVID death for the last couple of years. It would be nice to add a line covering diseases of the circulatory system but the ONS don't care to release that data even under FOI. I think we can guess why. Topline figures-wise here are the accumulated totals for the period w/b 7/3/20 - w/b 20/2/21 as they stand in my spreadsheet this morning:

- COVID deaths (observed co-morbid): 130,991
- COVID deaths (adjusted causal): 115,731
- Respiratory deaths (official causal): 53,374
- Respiratory deaths (modelled causal): 93,373
- Respiratory deaths (modelled co-morbid): 558,931
- All cause deaths (observed causal): 628,748







Source: <https://coronavirus.data.gov.uk/>

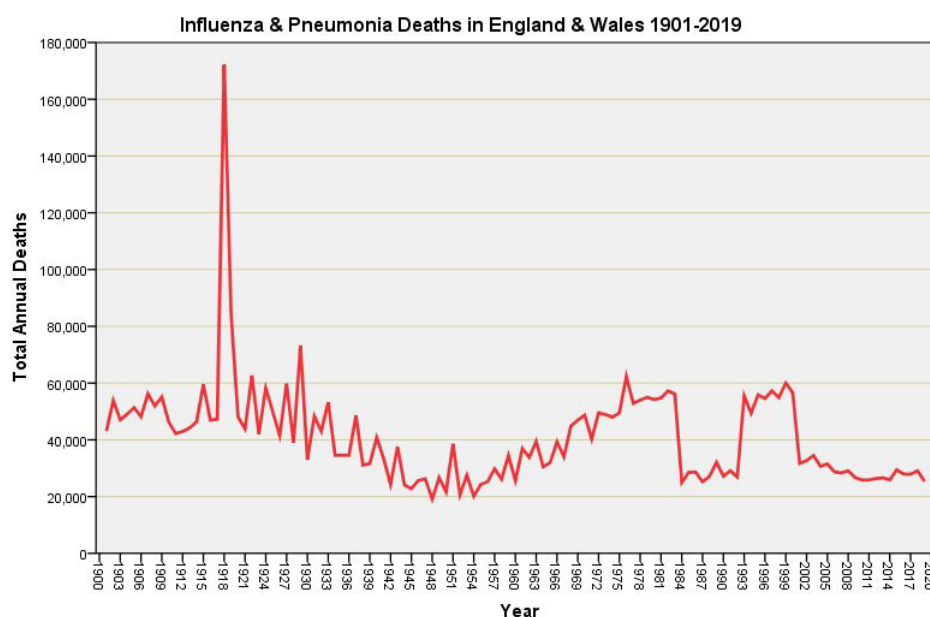
## Jack In The Box

I unearthed what promised to be a rather exciting time series down in ONS' store of death data this being annual counts of influenza and pneumonia deaths in England and Wales dating back to 1901. Unfortunately it seems I've uncovered a veritable jack-in-the-box, as you can see for yourselves!

Did these respiratory conditions magically disappear from 1984 to 1992 only to emerge unscathed in 1993 before disappearing again forever in 2001, or are we looking at the curse of the clinical coders? Real diseases don't surprise us like this so something is clearly wrong down in the engine room over at ONS.

Now here's the interesting thing... the Jack has been hiding down in the box since 2001 and I am going to guess is likely to remain hidden during 2020 and 2021 thus giving us a false impression of low influenza and pneumonia rates with which to compare to COVID. Interesting innit?

Also interesting is the spike generated by the infamous Spanish 'Flu, this being a spike of 172,149 deaths registered in the year 1918 and a lesser spike of 83,943 deaths registered in 1919. What happened to the alleged mild first wave and deadly second wave? I suspect I am going to need the big teapot.



Source: Office for National Statistics

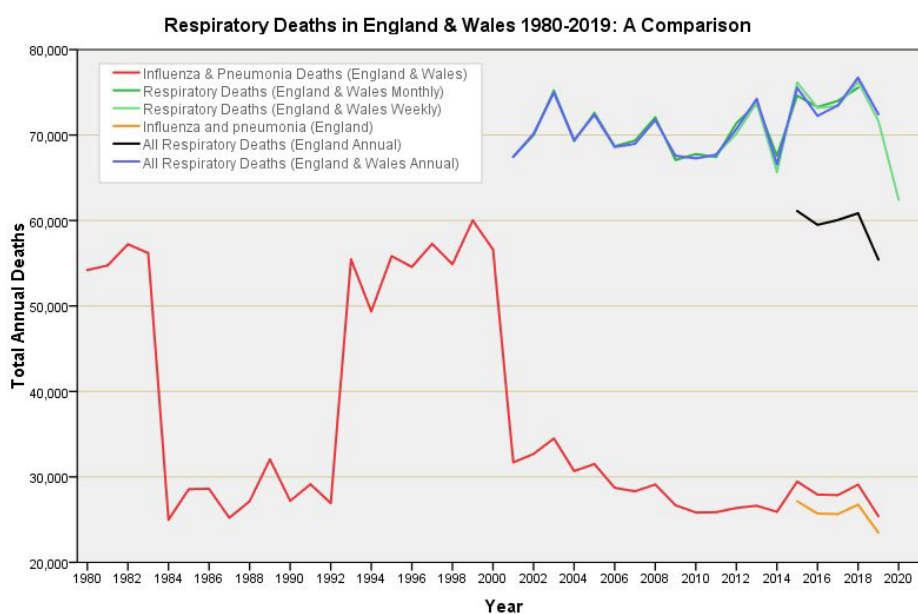


## Non The Wiser

In attempting to unravel the mystery enshrined in my post entitled 'Jack In The Box' I have downloaded several different datasets from ONS and plonked the results down on one colourful slide. Whilst there is excellent agreement between several datasets that black line for all respiratory deaths in England (annual series) is sitting well below the equivalent series for England & Wales. Either this is an error or Wales isn't a good place for chest conditions; this may well be the case.

All this comparison has done is tell us that the ONS have decided on a coding framework for influenza and pneumonia that is different to the coding framework adopted between 1993 and 2000. Either that or England & Wales suffered a prolonged pandemic between 1993 and 2000 that somehow slipped past the magic solution discovered in 1984. Unless a well-experienced GP can point me in the direction of prolonged 'flu pandemics and their magical solutions I am going to assume coding definitions were changed in 1984, 1993 and 2001.

The question on my parched lips now is what should genuine influenza and pneumonia death counts for England & Wales look like without all this goalpost shifting? Now for a much-needed cuppa!



Source: Office for National Statistics

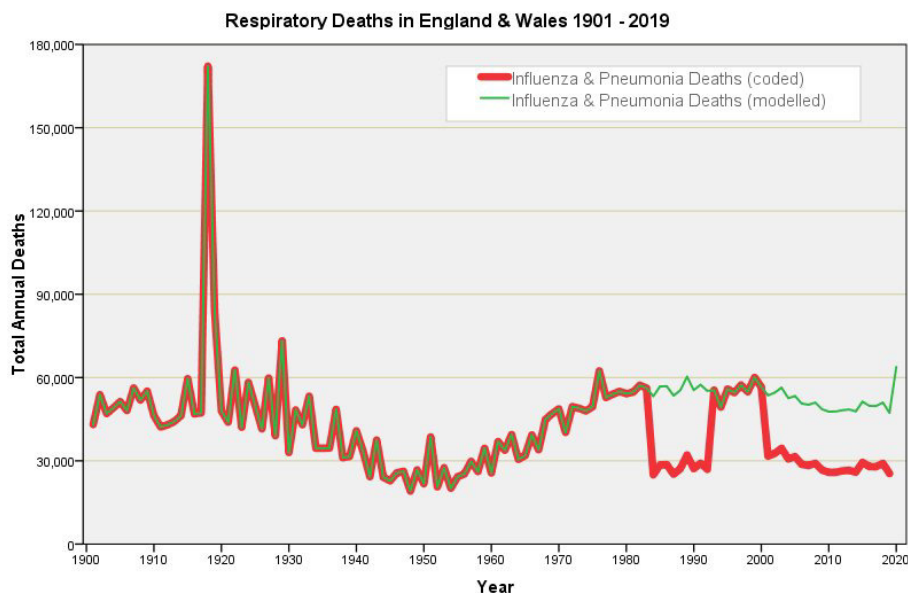
## In A Nutshell

I am hoping that my series of recent posts has brought folk to the realisation that death certification during the pandemic is not following medical reality and that ONS are happy to alter coding to suit WHO guidelines. We have also seen how coding changes have magically solved our perennial respiratory disease problem here in the UK, and we have also seen just how bold the ONS can be in re-coding thousands of annual deaths in step-like fashion.

What I have done to close today's investigation is use statistical modelling techniques to correct the long-term record for influenza and pneumonia death thereby revealing what that record should look like.

The attached slide should provide confidence in these powerful statistical techniques for we can see my model tracking the data with near perfection (R-square = 0.924). The model also goes on to provide an estimate for influenza and pneumonia death during 2020 (63,744 cases) - these will be a mix of COVID and non-COVID conditions. Shrewd observers will note epidemics of equal and greater stature in 1976 and 1929 and that the scale of the current pandemic has been artificially manufactured by lowering the baseline from 2001 onward.

As time permits I will continue to unravel the true story behind the COVID statistics (as far as I am able) but it should be pretty plain by now that data manipulation has been and continues to be extensive.



**20th March 2021**

### ***Influenza & Pneumonia Historic Mortality***

Well here it is folks, the time series for influenza & pneumonia causal deaths per 100k population in England and Wales over the period 1901 - 2020. Our pandemic is now put into proper perspective at last!

That little blip for 2020 has come from statistical modelling of all cause death in England and Wales as a predictor of deaths due to influenza & pneumonia and will thus include both COVID as well as non-COVID cases. When the ONS decide to release the relevant data (several FOI requests have been turned down) I will double-check my estimate against actual counts though, as we have seen in the post entitled 'Jack In The Box', these counts are likely invalid owing to the coding fun and games that is evidently going on.

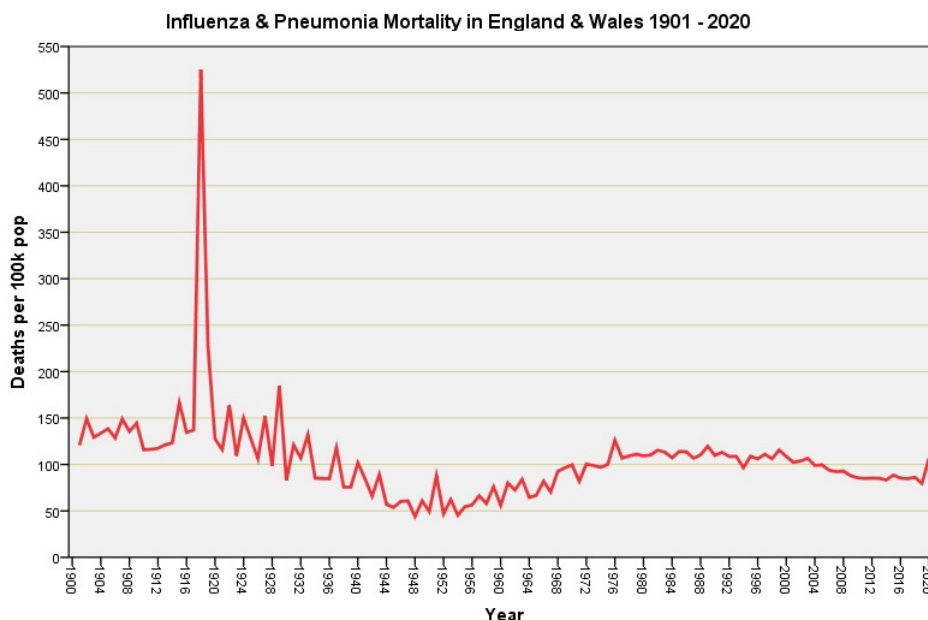
There are a couple of features of interest here, starting with the extraordinary fact that the 2020 pandemic, as a blip, isn't anything special - there's a nice little blip in 1976 and another in 1951 and several between 1920 and 1944, as we may expect.

In terms of the death rate achieved 2020 wasn't anything special either, for if we rank years according to mortality rate we find 2020 fetching up in 55th place. Some folk will grumble at this and say we shouldn't be considering musty old data prior to the twenty-first century. If I delete data prior to 2001 we find 2020, at 106.64 deaths per 100k population, coming second place to 2003 at 106.65 deaths per 100k population. It would seem that health experts, as well as the press and politicians have short memories.

Another interesting feature of this historic series is that death from influenza and pneumonia was at it lowest ebb just after WWII, prior to the post-war vaccination campaigns for children. Those same campaigns over the next few decades managed to secure the death rate from acute respiratory illness at levels last seen in the 1920s and 30s. This is quite an achievement.

Why the nation was healthiest in terms of acute respiratory illness just after the war is a topic worth chewing on, as is the evident and somewhat ironic decline in acute respiratory health as the healthcare and the pharmaceutical industries blossomed.

What we have then, is not so much a pandemic as a marketing exercise aimed at those with short memories, little reasoning ability and an unswerving faith in authority figures.



Source: Office for National Statistics

**21<sup>st</sup> March 2021**

### ***What Pandemic?***

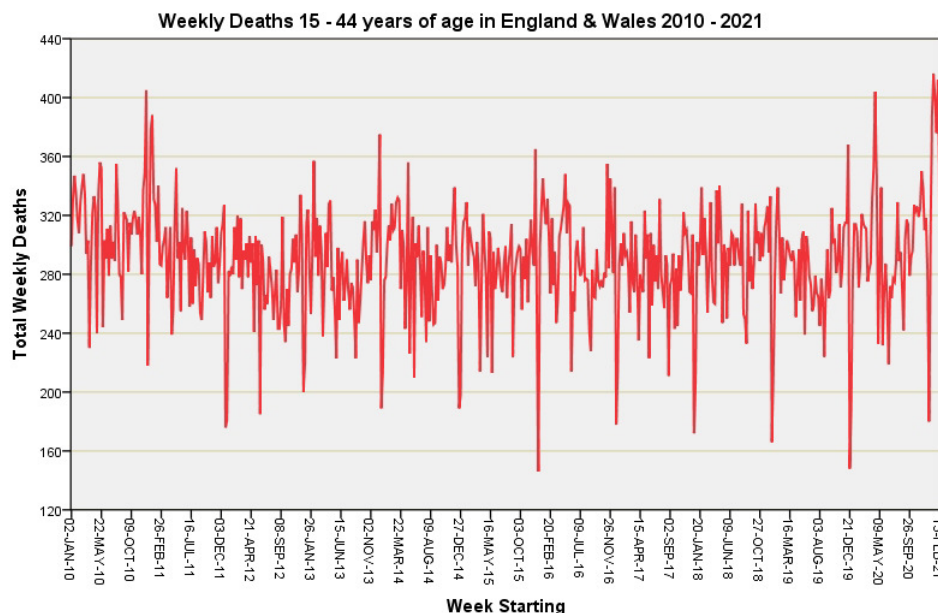
The historic ONS weekly datafile series dating back to 2010 usefully provides the number of weekly all cause deaths broken down by 7 age bands (Under 1 year, 1 - 14, 15 - 44, 45 - 64, 65 - 74, 75 - 84 and 85 years and older). Since it is widely acknowledged that COVID hasn't been a major threat for children I decided to start my analysis by looking at the 15 - 44 year group.

What I discovered surprised me somewhat - if I hadn't been told there was a pandemic I wouldn't have guessed it from the time series plot! But see for yourself; there's a spike around April 2020 and a more pronounced spike in January 2021 but they don't exactly stand and shout "PANDEMIC!!!". Then there's that big spike way back in December 2010. Goodness knows what we would find if we went back another ten to twenty years, so I've kindly requested this data from ONS.

What we can do with a wonderful time series like this is subject it to a statistical technique called Temporal Causal Modelling (TCM). TCM uses the concept of Granger causality (see Wiki) to determine the significance of other data series as correlated predictors. What we can do with this powerful technique is create an indicator series marking the temporal extent of the three national lockdowns and another to mark the onset of the pandemic in March 2020. We may then determine whether these are statistically significant factors in the prediction of weekly all cause deaths for the 15 - 44 age group.

Now this is where my eyebrows hit the ceiling, for TCM revealed the indicator for presence of a pandemic starting w/b 7th March 2020 to be insignificant ( $p=0.509$ ), whereas statistical significance for the indicator of national lockdowns went off the scale ( $p<0.00001$ ).

What this means, in plain English, is that folk in the age group 15 - 44 years are tending to die at a greater weekly rate during periods of lockdown but the pandemic itself isn't having any overall effect on this age group. I appreciate this is astonishing so in the next episode we'll take a look at a couple of error bar plots just to confirm this is indeed the case.



Sources: Office for National Statistics, <https://coronavirus.data.gov.uk/>

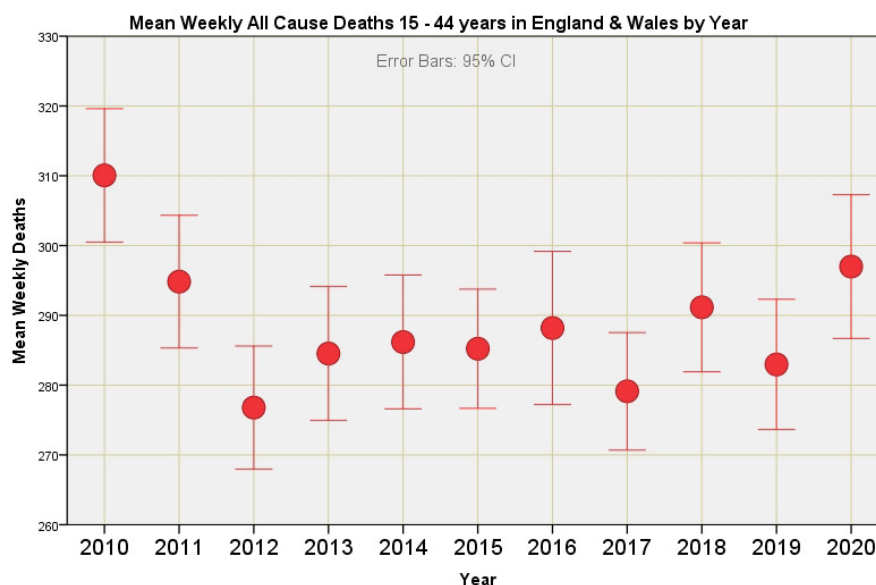
## The Pudding

In my previous post entitled 'What Pandemic?' I found some rather unexpected results for the 15 - 44 year age group that were at once astonishing and somewhat chilling and promised to run off two error bar plots just to double check. Here they are. In the first of these we see the mean weekly all cause death rate for the 15 - 44 year group by year and find 2020 was nothing special, being matched by similar rates back in 2011 and beaten into second place by rates back in 2010. Goodness knows what we'd find if we went further back! [N.B. To avoid seasonal bias I've had to restrict this analysis to whole years only - once 2021 is completed I'll be able to add it to the plot.]

So here is that statistical insignificance of  $p < 0.509$  dropping out of my Temporal Causal Modelling (TCM), as plain as plain can be. What this is telling us is that the pandemic has had little or no impact on all cause mortality for the 15 - 44 year group. Not only that but 2010 was much worse!

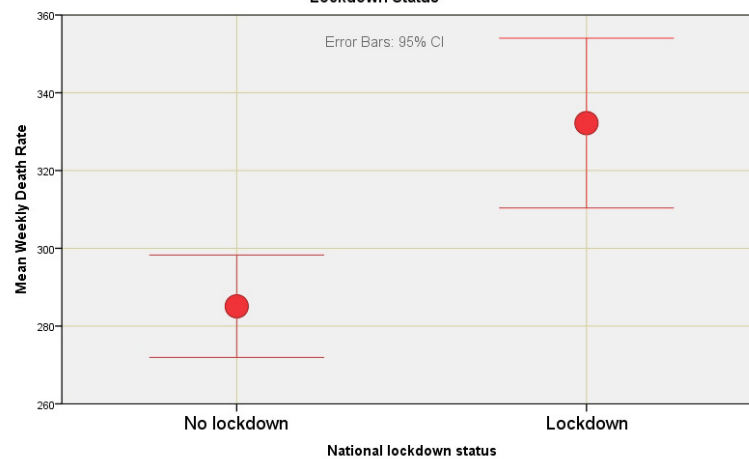
For the second slide I've taken the period w/b 7th March 2020 - w/b 20th February 2020 and sliced this into weeks of no lockdown and weeks of national lockdown. We can clearly see that the mean weekly all cause death rate for the 15 - 44 group is elevated during periods of lockdown, this being very highly statistically significant ( $p = 0.0004$ ; Mann-Whitney,  $n = 51$ ).

We may conclude the 15 - 44 group are being killed by government policy rather than the virus. One reason for this may well be increased suicides and I shall be obtaining data from ONS to verify this hypothesis. There is also the distinct possibility of increased incidence of domestic violence, drug abuse and alcohol abuse. Does public health mean caring for everybody or not?



Sources: Office for National Statistics, <https://coronavirus.data.gov.uk/>

Mean Weekly All Cause Death Rates 15 - 44 years in England & Wales March 2020 - February 2021 by Lockdown Status



Sources: Office for National Statistics, <https://coronavirus.data.gov.uk/>

## THIS Pandemic!

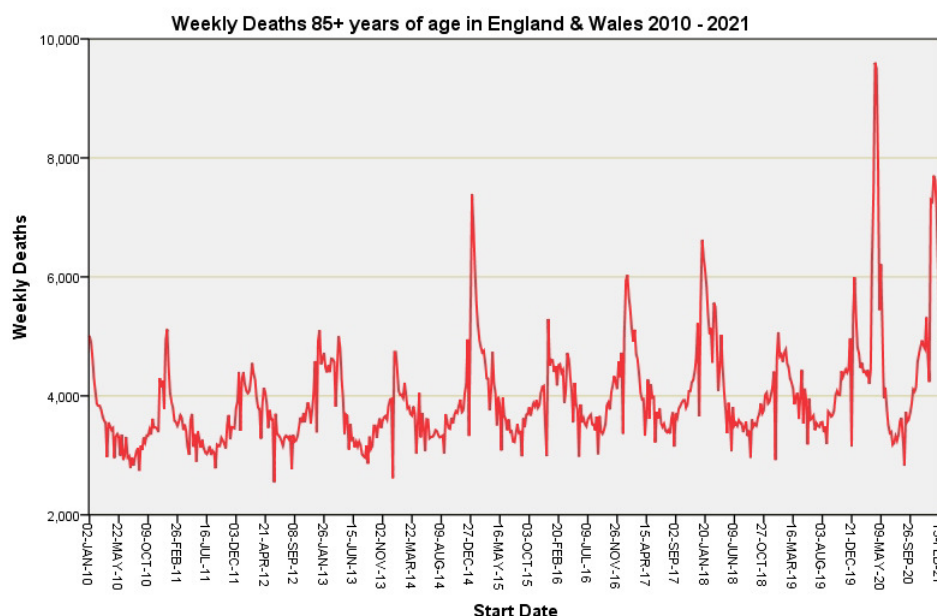
With all cause weekly death in the 15 - 44 year group shedding light on what is and isn't going on I though we'd better turn straight to the most vulnerable age group and see how these folk have fared.

In the time series now we see a mighty different story, with sharp peaks during April 2020 and January 2021. That being said the seasonal peak back in December 2014 should raise an eyebrow and, of course, we have no idea of what seasonal peaks were reached prior to 2010. With luck my data request from ONS will be granted and we'll get to see this series extended back to 2000 or before.

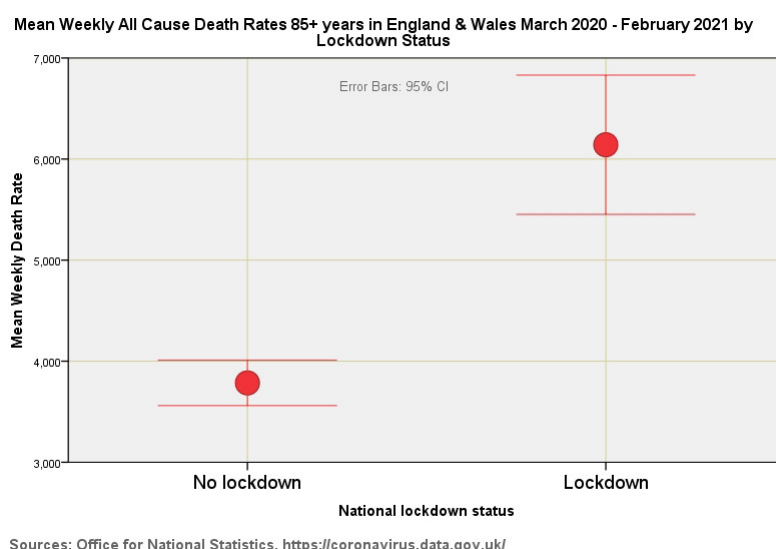
So what did Temporal Causal Modelling (TCM) reveal? It revealed just what we anticipated in that the indicator variable for presence of a pandemic was found to be highly statistically significant in the prediction of weekly all cause death for this age group ( $p=0.00002$ ). It also revealed what we didn't anticipate and that is the indicator variable for periods of national lockdown is also highly statistically significant in the prediction of weekly all cause death for this age group ( $p=0.000004$ ).

In plain English the virus is killing our most vulnerable people but so are lockdown policies. This is more easily seen in the error bar plot. For this second slide I've taken the period w/b 7th March 2020 - w/b 20th February 2020 and sliced this into weeks of no lockdown and weeks of national lockdown.

As a general rule of thumb 2,000 more of our vulnerable folk are dying each week during lockdown than when restrictions are lifted. To say this makes my blood boil is an understatement. If I can find time I'll produce a refined estimate. I have also started downloading ONS data for deaths in care homes so we can see what this tells us.



Sources: Office for National Statistics, <https://coronavirus.data.gov.uk/>



## Confounding Factors

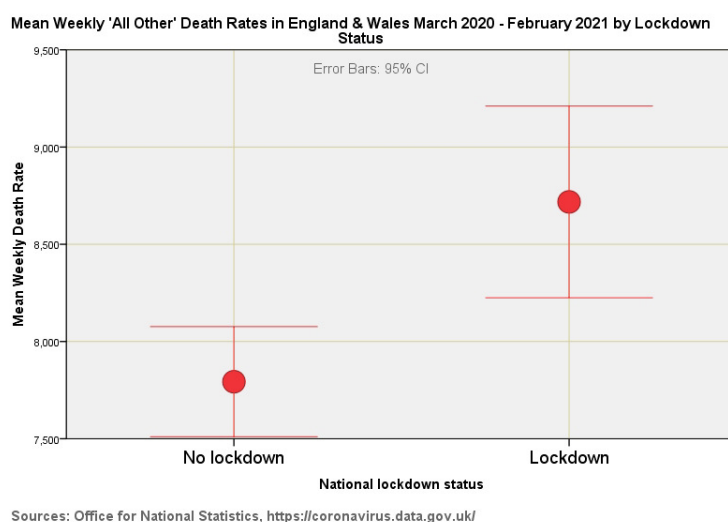
A rather shrewd member who knows his onions has raised the ugly issue of confounding factors in the estimation of deaths due to lockdown policies. In comparing non-lockdown and lockdown mean weekly death rates since March 2020 an assumption is made that the virus is killing folk at the same rate each week, that infection rates within the general population are the same each week and that PCR test rates within the population are the same each week (assuming these influenced death certification).

These are mighty bold assumptions and offer a fine example of what goes on behind the numerical scenes whenever an expert from PHE, DHSC, ONS or NHS stands up and waves their hands. The difference is that I'm not ashamed to admit things and re-run analyses to get a better approximation of the truth.

There are many ways to unravel confounding factors and I thought I'd start with the easiest to grasp... we exclude COVID deaths and we exclude respiratory deaths and simply look at what happened to all other deaths. This is a messy group that will include road traffic fatalities, homicide, suicide, intoxication and all the rest.

The assumption here is that these deaths will have nothing to do with what the virus was doing or how people were being tested. On this basis I have produced another error bar plot and once again we find statistical significance ( $p=0.003$ , Mann-Whitney,  $n=51$ ), with the mean weekly death rate rising from 7,793 deaths per week to 8,718 deaths per week on average.

In plain English nearly a thousand more people a week (925) are dying during periods of national lockdown despite their death being independent of anything COVID. For a fuller picture of just how horrific the whole sorry situation is please see my post 'Lockdown Deaths Revisited.'





**22nd March 2021**

### ***Testing, testing...***

A person responding well to my grumping over on PHE's page is trying to grasp why rates per test are important but they admit to not having the penny drop. I have written this little piece to assist them and thought folk here also might find it useful...

Let us suppose 10% of the population are infected. If we go out on Monday and test 10 people we'll expect to find 1 positive case (all things being equal). If we go out on Tuesday and test 100 people we'll expect to find 10 positive cases. If we go out on Wednesday and test 1,000 people we'll expect to find 100 cases. If we then report these figures as raw counts 1 - 10 - 100 it will look like the number of cases is rising and the infection spreading but it is not, it has remained at 10%. If we divide these numbers by the population of the area in which we sample we'll get a rate per 100k and it will still look like the infection is spreading in time but it is not; all that we are doing is increasing the likelihood of capturing a positive case by increasing our sample size.

The same principle applies to sampling across age bands. Let us suppose 10% of the population are infected regardless of age. If we go out on Monday and test 10 kids we'll expect to find one positive case (all things being equal). If we go out on Tuesday and test 100 adults we'll expect to find 10 positive cases. If we go out on Wednesday and test 1,000 teenagers we'll expect to find 100 cases. Without accounting for the differing numbers of tests and simply reporting 1 - 10 - 100 (whether these figures are turned into rates per 100k or nay) it will look like the infection is rampant among teenagers and our conclusion will be false.

The same goes for regional breakdowns per 100k issued by PHE - unless we account for differing test densities across regions we cannot say anything about comparative rates. This is because the test is the fundamental sampling unit. For a given level of infection amongst the population a vast number of tests will yield a vast number of cases but if Boris cancelled all testing tomorrow new cases would drop to zero the day after.

What will complicate this is the disease will be spreading, shifting and contracting across regions and age groups. If we undertake equal numbers of tests across age bands and across regions and across months we'll be able to track these changes reasonably well within the bounds of sampling error. But this is not what is happening; we are taking unequal numbers of tests across age bands, across regions and across months and this is introducing considerable sampling bias.

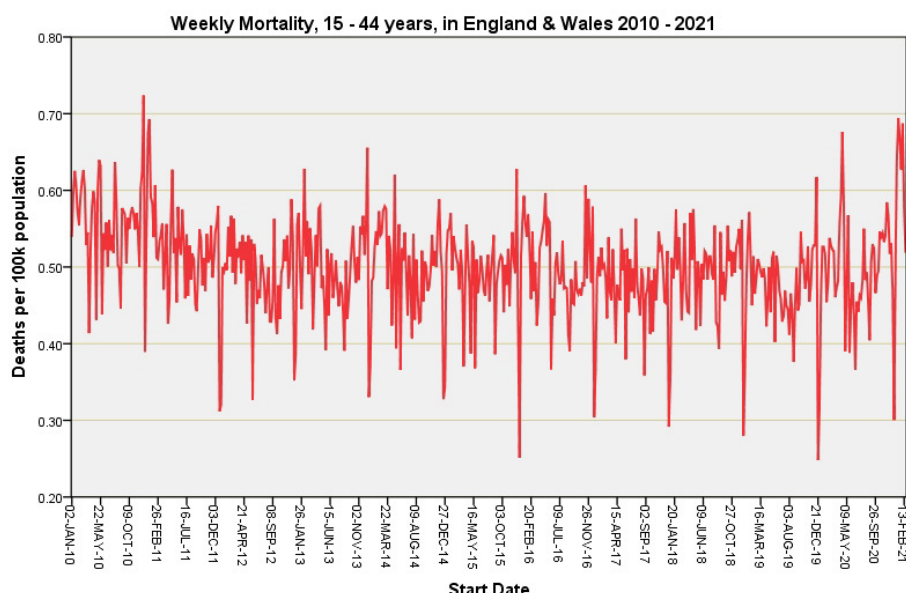
**23rd March 2021**

### ***Weekly Mortality Rate (15-44 yrs)***

Whenever we start looking at death counts over a considerable period of time the issue of mortality rate arises. If the population has been growing then we'd expect more deaths (all things being equal), so we turn to calculating rates such as deaths per 100k population. Deaths we can count easily but counting the population is a different matter. Counting the UK population each week, each month and even each year would be impossible so cunning bods at the ONS run growth models to obtain what they call mid-year estimates. These models are then calibrated each time we undertake a national census like the one last Sunday. Prior to this the census was taken on Sunday 27th March 2011.

What I've done is taken the series of ONS mid-year estimates to predict what the population has likely done over the period 2012 - 2021 using time series techniques, and this has allowed me to infill my database with weekly population estimates, thence to calculate weekly mortality rates. Yes indeed, this is a lot of fiddling about!

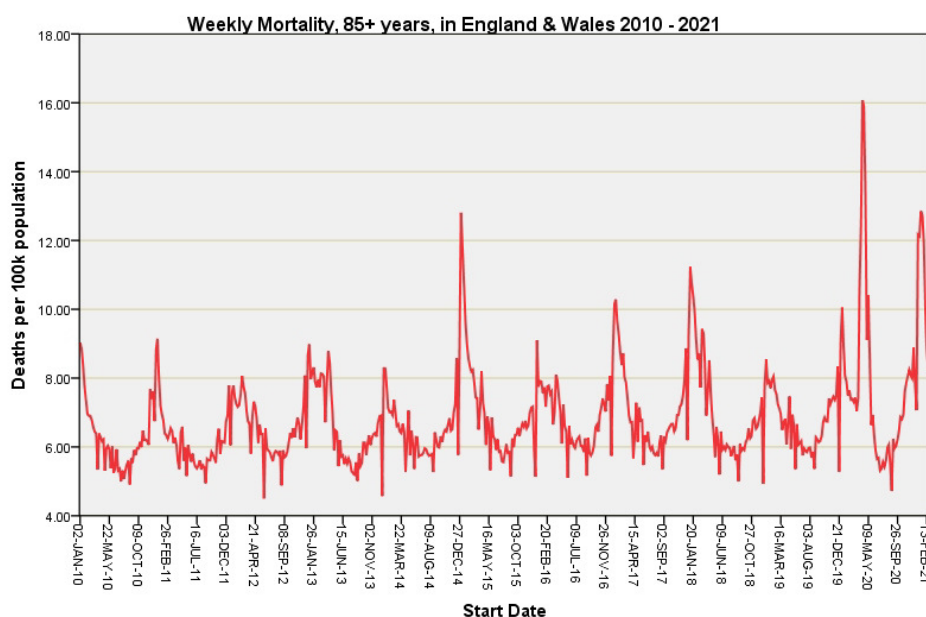
Herewith the fruits of my labours in a simple time series chart depicting mortality rates for deaths occurring in the 15 - 44 age band. All very interesting indeed. If I were an alien arriving on Earth and looking at this chart I'd want to know why we were locking these people away. The post-vaccination 'blip' is intriguing but I'll need a few more weeks data before I can investigate whether the mysterious post-rollout hike in death rates for this age band is hitting statistical significance.



Sources: Office for National Statistics, <https://coronavirus.data.gov.uk/>

### ***Weekly Mortality Rate (85+ yrs)***

Following on from my last post herewith the equivalent weekly rate analysis for our most vulnerable age group. That spike back in April 2020 suggests that we didn't protect these folk in good time. The second spike for this age group in January 2021 is interesting in that it is matched by a spike of similar size back in December 2014. Are we now looking at classic seasonal respiratory death that is being re-packaged as COVID-19 owing to inappropriate use of the RT-PCR test?



Sources: Office for National Statistics, <https://coronavirus.data.gov.uk/>

### ***Cheeky Weekly Mortality Rate (85+ yrs)***

After 30 years in the business my eyeballs are quite used to picking out features on time series plots and this morning they were suggesting to me that the peak COVID-19 outbreak we saw back in the eight week period w/b 28th March is dominating our visually-guided thought process.

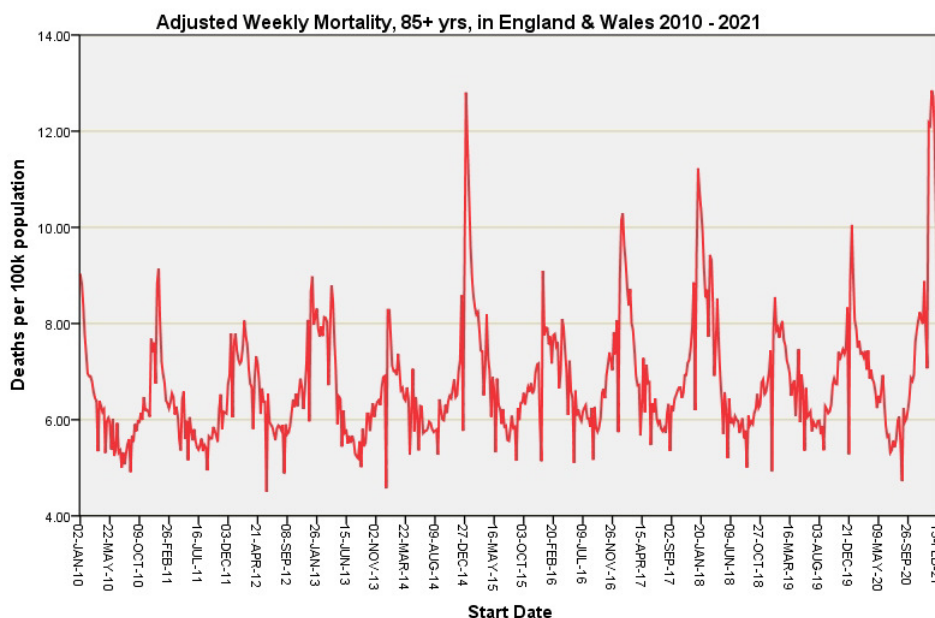
Back in the old days we used to operate something called 'the rule of thumb', whereby if a statistical relationship could be made to disappear by sticking your thumb over a subset of points then it was likely a mirage.

Whilst COVID-19 back in 2020 most certainly wasn't a mirage, what I've gone and done for this analysis is replace observed mortality rates for that eight week peak period with equivalent weekly mean rates derived from 2010 - 2019. The idea here is to surgically remove that intense peak to see how we then react.

The resulting rather cheeky plot is utterly fascinating because the pandemic seems to have disappeared, even for our most vulnerable age group! This may seem like fiddle-fudge but in the trade it is called sensitivity analysis and it is a powerful tool for judging the situation. As it stands our eyes have led us to the surprising conclusion that there was a problem for eight weeks beginning 28th March 2020 that evaporated directly after.

Eyeballs are one thing but rigorous analysis another. What we need to do next is test this hypothesis by running Temporal Causal Modelling (TCM) with an indicator variable for presence of a pandemic within the population. When this is done we find the unadjusted series yielding a highly statistically significant result, as expected ( $p < 0.0001$ ) but the adjusted series yields a statistically insignificant result ( $p = 0.816$ ).

In plain English what this sensitivity analysis reveals is that the pandemic (in terms of mortality outcome for the 85+ year group across England & Wales) was constrained within those eight critical weeks.



Sources: Office for National Statistics, <https://coronavirus.data.gov.uk/>

**25<sup>th</sup> March 2021**

## ***Death By Trial***

In my post 'Cheeky Weekly Mortality Rate (85+ yrs)' we discovered something extraordinary – the whole darn shooting match collapsed before our very eyes (and before Temporal Causal Modelling) for the oldest and sickest sector of the UK population once we surgically removed a data wart of just eight weeks commencing w/b 28<sup>th</sup> March 2020. How is this even remotely possible in the middle of a global pandemic? Whilst scratching my head a kindly GP confirmed this was their experience on the ground.

So what is a pandemic? Well, bizarrely, it's no longer about death and suffering for WHO removed that stipulation when they started changing the definition sometime between January 2003 and July 2008. According to the WHO "a pandemic is the worldwide spread of a new disease" – and that's it. What we have, then, is a shift away from visible mortal outcome to genome sequencing, and reliance on evidence mustered by one or two grant-funded experts instead of thousands of victims. This wouldn't be half so bad if these experts could produce purified viral isolates using unadulterated cultures taken directly from infected humans but they don't do this. What a virologist calls an 'isolate' these days is simply the supernatant extracted using an ultra-centrifuge on cultures grown on all manner and treated to all manner. This guarantees they'll find something novel over which they can hypothesise.

So a pandemic it is and, aside from those eight weeks and a seasonal hike last January, not a particularly lethal one even for the 85+ year age group. But those eight weeks bothered me because real pathogens don't act that way. Neither do they yield differing outcomes in different countries, and then different regions of those countries, and then different hospitals with those differing regions in differing countries, and then different wards within different hospitals with those differing regions in differing countries. I think you get the picture. At this point I trod on the missing piece of the jigsaw...

On 18<sup>th</sup> March 2020 Tedros Adhanom Ghebreyesus announced the SOLIDARITY study to explore the most effective drug combinations in the battle against COVID-19. The primary contenders for this global trial were remdesivir, lopinavir/ritonavir (Kaletra), and interferon- $\beta$  in combination with Kaletra and hydroxychloroquine and chloroquine. These drugs offer a small toxic to therapeutic margin and more than one senior voice has expressed concern about WHO's recommended dosage. In addition both hydroxychloroquine and chloroquine are difficult for the body to breakdown, having an effective half-life of 1 – 2 months, meaning that it is easy to overdose through accumulation. Among the

countries joining the trial were Belgium, Spain, France and Switzerland - all of whom exhibited unusually high case mortality rates in the early stages of the outbreak. But that's not all.

On 22<sup>nd</sup> March 2020 the French biomedical agency INSERM announced an additional European-wide trial called DISCOVERY that was designed to test the same drugs with the exception of chloroquine. By 8<sup>th</sup> April the University hospital in Nice (CHU) had to stop experimental treatment with high dose hydroxychloroquine due to risk of cardiac arrhythmia. In contrast, come 8<sup>th</sup> June 2020 Belgium had settled on high dose hydroxychloroquine in the treatment of COVID-19... and was leading Europe in COVID fatalities per capita. But that's not all.

On 3<sup>rd</sup> April 2020 the UK government announced that around 1,000 patients from 132 hospitals had been rapidly recruited for a trial called RECOVERY. With thousands more participants promised, the UK government aimed to conduct the largest randomized controlled trial of COVID-19 drug therapies in the world. This study focused on lopinavir/ritonavir, dexamethasone, hydroxychloroquine, azithromycin, tocilizumab and a monoclonal antibody preparation called REGN-COV2. The hydroxychloroquine arm of the study was abruptly discontinued on 5<sup>th</sup> June 2020 with claims that the drug offered little "benefit", yet Engelbrecht et al in their book 'Viral Mania' state that 25.7% of treated patients had died. Shortly after, on 17<sup>th</sup> June 2020, the hydroxychloroquine arm of WHO's SOLIDARITY study also abruptly ended. But that's not all.

A global trial called REMAP was instigated to explore treatment for patients on ventilators or in shock owing to a rapidly deteriorating condition. High dose hydroxychloroquine was again the focus but in combination with lopinavir/ritonavir. Trials took place at 200 sites in 14 countries including Belgium, Spain, Netherlands, UK and USA – again all countries that were notching up significant death counts.

I don't know about you folks but I'm getting an uneasy feeling that all these exploratory trials designed to test a raft of drug therapies to combat COVID-19 may have generated iatrogenic death on an unprecedented scale via high dose and cumulative toxicity leading to liver failure, sudden cardiac death and multi-organ failure. Quite where we go from here I have no idea because attributing causality is near impossible at the best of times, and especially if placebo arms are ruled out on grounds that it is unethical to withhold treatment, and especially if autopsy and post mortem is ruled out under emergency Laws.

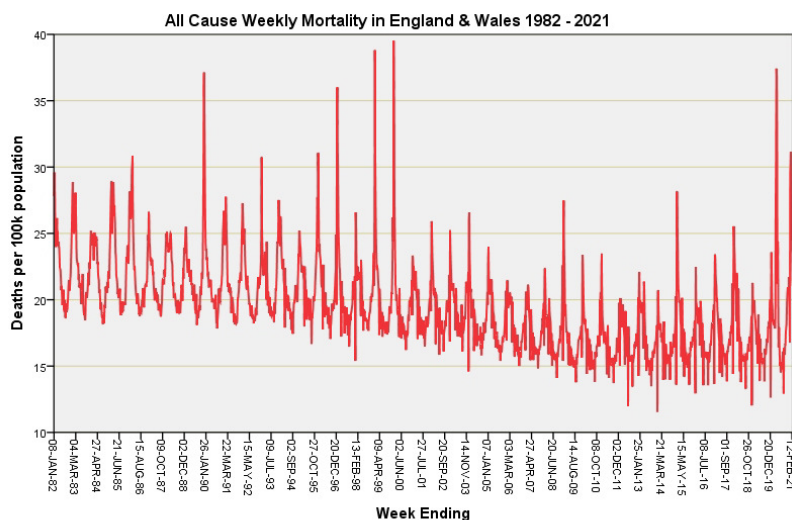
## 26<sup>th</sup> March 2021

### *Historic Weekly Mortality*

With assistance from bods at the Office for National Statistics I have been able to piece together data for all cause weekly mortality across England and Wales for the period w/b 2<sup>nd</sup> January 1982 – 20<sup>th</sup> February 2021. This has involved requests for archived files of weekly registered deaths and statistical modelling of ONS mid-year population estimates to obtain weekly estimates both for the UK and England and Wales. Please note that this plot is based on date of death registration as opposed to date of occurrence. Delays in the registration process can induce spikes that reflect administrative matters as much as they reflect incidence of death, and these can be thought of as jitter in the system.

With all this in mind we can now turn to the slide and place the current pandemic into historical perspective. And what a perspective it is! We find weekly mortality for w/b 1<sup>st</sup> January 2000 at 39.52 deaths per 100k population and weekly mortality for w/b 2<sup>nd</sup> January 1999 at 38.81 deaths per 100k population exceeding the current peak pandemic mortality of 37.42 deaths per 100k population for w/b 11<sup>th</sup> April 2020, with mortality for w/b 16<sup>th</sup> December 1989 coming close behind at 37.14 deaths per 100k population.

We may conclude that the current pandemic is by no means unique in terms of peak death registration and there is little evidence of excessive all cause mortality over the last 12 months. In the next episode I shall be smoothing out those peaks in order to get a grip on the 'volume' of fatalities, as it were.



## Vaccine & Transmission

Back on 8th February 2021 a research team uploaded a paper to medRxiv that caused quite a stir. Entitled '*Initial real world evidence for lower viral load of individuals who have been vaccinated by BNT162b2*' this is very the paper at the heart of all claims that the vaccine may reduce viral transmission. The results were splattered over the media and, as we have come to expect these days, the public took the message on board without critical thought. Here's my initial response upon a first reading:

1. The paper was not peer-reviewed and published in a formal journal so may well contain errors.
2. The paper heavily relies on estimation, a critical weakness being they didn't have access to data on vaccination or clinical status for individuals - an alarming omission!
3. The study is cross-sectional and not longitudinal. By that I mean they didn't track individual people over time to see if their viral load diminished after vaccination. Instead, they relied on changing Ct threshold values within a cross-section population that had been divided into two age bands.
4. Individual Ct threshold values, test date and vaccination date data were not available. This is a mind-boggling omission, for without this we have no idea whether Ct values for individuals were lower or higher immediately after vaccination. Neither do we have any idea of individual viral loads in the run up to vaccination and in the weeks after.
5. We have no idea of the rate of false positive and false negative test results occurring within the population. The paper assumes testing is 100% accurate in the detection of cases and quantification of viral loads.
6. The authors assume that increased mean Ct threshold indicates smaller viral loads. Whilst this is correct a major confounding factor is increased likelihood of false positives as Ct values rise.
7. Figure 2 offers a contradictory result in that all box and whisker plots greatly overlap yet an extreme p-value of  $p=0.000007$  is claimed for the overlapping Jan15-30 pair. This is most peculiar and I would suggest their statistical methodology is scrutinised.
8. In the results section they make an inexplicable distinction between the "late January period" and the "late January variable" which makes no sense in terms of their declared modelling strategy.
9. Their age term inexplicably becomes statistically significant in model III when this was absent in model II and model I. This suggests multi-collinearity within the data that has not been properly accounted for.
10. Their final calculations on viral load following vaccination are based on several assumptions and a somewhat suspect linear model rather than empirical evidence.
11. The authors do not consider variations in viral load within the population arising from factors other than vaccination, such as the progression of endogenous vitamin D3 production, prophylactic medication (both COVID-19 specific and non-specific) and immunity conferred through the natural recovery process.
12. Without an un-vaccinated control group for the elderly this study is virtually pointless.
13. Use of Ct threshold values to determine viral load dynamics within a population is only made possible if initial samples are precisely and absolutely identical in every aspect. For example, a nasal swab containing just 2 SARS-COV-2 mRNA fragments will replicate to 34.360 billion DNA chains at a Ct threshold of 35, whereas a swab containing 3 SARS-COV-2 mRNA fragments will replicate to 51.540 billion DNA chains at the same threshold, the difference being a monstrous 17,179,869,184 DNA chains arising from just a difference of 1 mRNA molecule. The authors are expecting us to imagine the population of Israel handing in nasal and other swabs to molecular precision. Such is the sheer and utter folly of the entire study.

[https://www.medrxiv.org/content/10.1101/2021.02.08.21251329v1.full.pdf?utm\\_source=Coronavirus\\_Update&utm\\_medium=email&utm\\_campaign=cvupdate021021](https://www.medrxiv.org/content/10.1101/2021.02.08.21251329v1.full.pdf?utm_source=Coronavirus_Update&utm_medium=email&utm_campaign=cvupdate021021)

## A worked Example In Nonsense

Let us suppose it takes 1 billion UV-tagged DNA chains to trigger a positive RT-PCR test result. If we start with a swab containing 1 viral mRNA molecule we'll hit that detection threshold in 31 test cycles. If we double the initial sample to 2 viral mRNA molecules we'll hit detection at 30 test cycles. With 4 viral mRNA molecules the Ct drops to 29 cycles, and at 8 viral mRNA molecules the Ct drops to 28 cycles. Thus, somebody happy to give their nose a good poke and fetch out 8 viral fragments will yield a Ct of 28, whereas somebody who gingerly dabbed about retrieving just 1 viral fragment will generate a Ct of 31.

These are small starting numbers. Get into real world swab tests where differences in biological samples run to millions of viral fragments and the differences in Ct threshold goes off the scale. By way of continuing our example a starting point of 8 million viral mRNA molecules hits the 1 billion UV-tagged DNA chain detection jackpot after just 8 cycles.

If elderly people don't like being poked up the nose, or if the method of obtaining swab samples changes over time, along with test kit development (and a zillion other things) then the extreme amplification offered by the RT-PCR test is going to make a total mockery of the Israeli paper touted as offering evidence of reduced viral loads following vaccination.

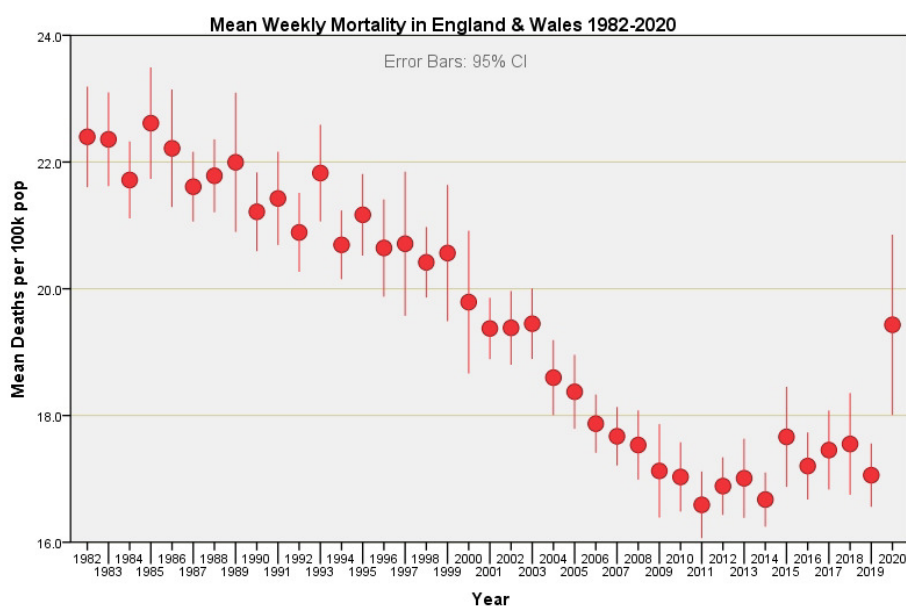
27<sup>th</sup> March 2021

## Mean Historic Weekly Mortality

In my previous post entitled 'Historic Weekly Mortality' I took a look at mortality in terms of weekly registered deaths per 100k population from 1982 to present. We saw a fair few surprising trends and peaks and concluded that the current pandemic is by no means unique in terms of peak death registration, with little evidence of excessive all cause mortality over the last 12 months. I drew attention to the vagaries of weekly death registration and the likelihood of peaks arising from administrative delays rather than a genuine increase in fatalities. In this analysis I am going to melt those weekly peaks down into annual means. To do so we have to compare full years and so the analysis was limited to 1982 – 2020.

BOOM! There we go. We now see something not so good was definitely going on during 2020 that clobbered England and Wales (and institutionalised elderly folk in particular). But here is the interesting thing... whatever was going on during 2020 wasn't any worse than what was going on back in 2003 and earlier. Sure, we've got an elevated mortality rate that sticks out like a sore thumb in the last two decades but this level of mortality isn't historically unusual for England and Wales, though it's clear something unpleasant hit the population.

One thing I've noted is that analyses being churned by big bods out don't go back that far. The splendid EuroMomo project, for instance, starts the data series at 2016 and consequently generates scary looking Z-score humps for England, thereby 'proving' the presence of a pandemic.



Sources: Office for National Statistics

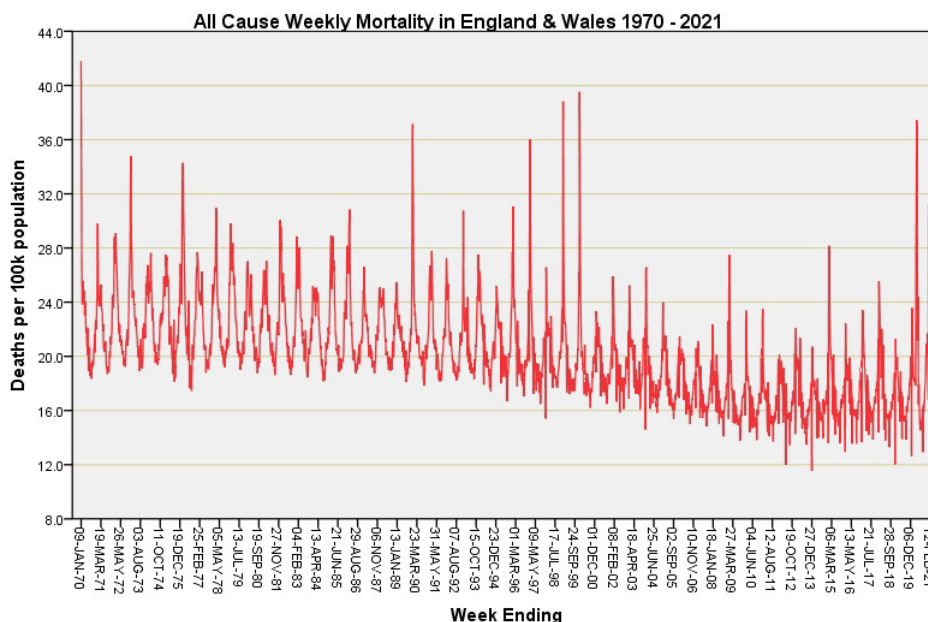
28<sup>th</sup> March 2021

## Extended Historic Weekly Mortality

With further assistance from bods at the Office for National Statistics I have been able to further extend all cause weekly mortality across England and Wales for the period w/b 3<sup>rd</sup> January 1970 – 20<sup>th</sup> February 2021. Please note that this plot is based on date of death registration as opposed to date of occurrence. Delays in the registration process can induce spikes that reflect administrative matters as much as they reflect incidence of death, and these can be thought of as jitter in the system. How about that for a slice of perspective? First place for death registration now goes to w/b 3<sup>rd</sup> January 1970, with the mortality rate sitting at 41.80 deaths per 100k population. The peak of the current pandemic, at 37.42 deaths per 100k population for w/b 11<sup>th</sup> April is now pushed down into fourth place behind 1970, 2000 and 1999.

Whilst cogitating on this slide I started to formulate a notion that these islands may get clobbered with influenza-type epidemics on a quasi regular basis. This is a vague notion along the lines of a serious influenza outbreak every 25 years or so with a mega outbreak every 50 or 100 years – that sort of thing. This is only a woolly notion at present with no support other than a hunch and a spike back in 1970 that feels very '2020.' All conjecture welcome!





Source: Office for National Statistics

## EudraVigilance Reports

COVID-19 MRNA VACCINE MODERNA (CX-024414)

[https://dap.ema.europa.eu/analytics/saw.dll?PortalPages&PortalPath=%2Fshared%2FPHV%20DAP%2F\\_portal%2FDAP&Action=Navigate&P0=1&P1=eq&P2=%22Line%20Listing%20Objects%22.%22Substance%20High%20Level%20Code%22&P3=1+40983312](https://dap.ema.europa.eu/analytics/saw.dll?PortalPages&PortalPath=%2Fshared%2FPHV%20DAP%2F_portal%2FDAP&Action=Navigate&P0=1&P1=eq&P2=%22Line%20Listing%20Objects%22.%22Substance%20High%20Level%20Code%22&P3=1+40983312)

COVID-19 MRNA VACCINE PFIZER-BIONTECH (TOZINAMERAN)

[https://dap.ema.europa.eu/analytics/saw.dll?PortalPages&PortalPath=%2Fshared%2FPHV%20DAP%2F\\_portal%2FDAP&Action=Navigate&P0=1&P1=eq&P2=%22Line%20Listing%20Objects%22.%22Substance%20High%20Level%20Code%22&P3=1+42325700](https://dap.ema.europa.eu/analytics/saw.dll?PortalPages&PortalPath=%2Fshared%2FPHV%20DAP%2F_portal%2FDAP&Action=Navigate&P0=1&P1=eq&P2=%22Line%20Listing%20Objects%22.%22Substance%20High%20Level%20Code%22&P3=1+42325700)

COVID-19 VACCINE ASTRAZENECA (CHADOX1 NCOV-19)

[https://dap.ema.europa.eu/analytics/saw.dll?PortalPages&PortalPath=%2Fshared%2FPHV%20DAP%2F\\_portal%2FDAP&Action=Navigate&P0=1&P1=eq&P2=%22Line%20Listing%20Objects%22.%22Substance%20High%20Level%20Code%22&P3=1+40995439](https://dap.ema.europa.eu/analytics/saw.dll?PortalPages&PortalPath=%2Fshared%2FPHV%20DAP%2F_portal%2FDAP&Action=Navigate&P0=1&P1=eq&P2=%22Line%20Listing%20Objects%22.%22Substance%20High%20Level%20Code%22&P3=1+40995439)

COVID-19 VACCINE JANSSEN (AD26.COV2.S)

[https://dap.ema.europa.eu/analytics/saw.dll?PortalPages&PortalPath=%2Fshared%2FPHV%20DAP%2F\\_portal%2FDAP&Action=Navigate&P0=1&P1=eq&P2=%22Line%20Listing%20Objects%22.%22Substance%20High%20Level%20Code%22&P3=1+42287887](https://dap.ema.europa.eu/analytics/saw.dll?PortalPages&PortalPath=%2Fshared%2FPHV%20DAP%2F_portal%2FDAP&Action=Navigate&P0=1&P1=eq&P2=%22Line%20Listing%20Objects%22.%22Substance%20High%20Level%20Code%22&P3=1+42287887)

## EudraVigilance: Death Counts

It is rather strange indeed that the wonderfully detailed EudraVigilance reporting system does not offer a summary table of fatal outcomes. To obtain these figures you have to work your way across to 'Number of Individual Cases for a selected Reaction' then work your way through all 27 reaction groups to obtain counts of fatalities. They couldn't have buried this information better if they tried!

This morning I've quietly worked my way through all 27 reaction groups for all COVID-19 vaccine products currently registered in ongoing trials (something that goes totally over the head of the public) and have produced this summary table for everyone.

The blue shaded cells are what I call 'iatrogenic+' these being deaths arising from personal circumstance and following clinical interventions and tests. The darker red band is where we'd find deaths attributed to COVID-19.

I shall be producing a sister table of percentages so we may compare reactions across the four products.

## European Deaths Following COVID-19 Vaccination by Product

| Accumulated Fatalities by Reaction Group |         |        |             |         |       |
|------------------------------------------|---------|--------|-------------|---------|-------|
| As at 27th March 2021                    | Moderna | Pfizer | AstraZeneca | Janssen | Total |
| Blood & lymphatic system                 | 0       | 21     | 33          | 0       | 54    |
| Cardiac                                  | 124     | 368    | 104         | 2       | 598   |
| Congenital                               | 0       | 2      | 1           | 0       | 3     |
| Ear & labyrinth                          | 0       | 2      | 0           | 0       | 2     |
| Endocrine                                | 0       | 1      | 1           | 0       | 2     |
| Eye                                      | 2       | 3      | 2           | 0       | 7     |
| Gastrointestinal                         | 43      | 172    | 34          | 0       | 249   |
| General & administration site            | 548     | 1,147  | 307         | 2       | 2,004 |
| Hepatobiliary                            | 2       | 14     | 3           | 0       | 19    |
| Immune system                            | 1       | 13     | 2           | 0       | 16    |
| Infections & infestations                | 69      | 332    | 67          | 0       | 468   |
| Injury, poisoning & complication         | 21      | 49     | 9           | 0       | 79    |
| Medical Investigations                   | 40      | 137    | 9           | 0       | 186   |
| Metabolism & nutritional                 | 22      | 69     | 7           | 0       | 98    |
| Musculoskeletal                          | 25      | 33     | 7           | 0       | 65    |
| Neoplasms                                | 3       | 3      | 2           | 0       | 8     |
| Nervous system                           | 138     | 267    | 105         | 0       | 510   |
| Pregnancy, puerperium & perinatal        | 0       | 4      | 0           | 0       | 4     |
| Product issues                           | 0       | 0      | 0           | 0       | 0     |
| Psychiatric                              | 16      | 47     | 4           | 0       | 67    |
| Renal & urinary                          | 13      | 50     | 8           | 0       | 71    |
| Reproductive & breast                    | 1       | 1      | 0           | 0       | 2     |
| Respiratory & thoracic                   | 111     | 381    | 79          | 0       | 571   |
| Skin & subcutaneous tissue               | 13      | 26     | 6           | 0       | 45    |
| Social circumstances                     | 3       | 6      | 2           | 0       | 11    |
| Surgical & medical procedures            | 5       | 5      | 8           | 0       | 18    |
| Vascular                                 | 46      | 115    | 37          | 0       | 198   |
| Total                                    | 1,246   | 3,268  | 837         | 4       | 5,355 |

Source: EudraVigilance European database for suspected adverse drug reaction reports  
<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

## EudraVigilance: Death Percentages

In my last post entitled '*EudraVigilance Death Counts*' I presented accumulated counts of fatalities obtained from the European database for suspected adverse drug reports for the four COVID-19 vaccine products currently subject to clinical trial. I don't have figures for the number of shots given per product so we can't calculate rates but what we can do at this stage is look at the percentage breakdown by reaction group to see how they stack up. Setting aside Janssen's new product the big three stack up rather similarly indeed, with deaths coded under '*General & administration site*' sticking out like a sore thumb at 37% of all deaths across all vaccine products.

This is a complicated, catch-all category that covers all manner of reaction, many of which are somewhat minor and concern injection site injury or localised skin reaction. Notable conditions include asthenia, chest pain, death, fatigue, general physical health deterioration, malaise, multiple organ dysfunction syndrome, pyrexia and sudden death. Trying to establish a breakdown is time consuming since a list of 200+ sub-conditions has to be trawled through by hand for each vaccine.

Taking Pfizer's product as an example we find 1,147 deaths coded under '*General & administration site*' of which 561 (49%) were attributed to 'Death', which doesn't exactly explain a great deal. We should note these entries were not coded as '*adverse drug reaction*' within the adverse drug reaction database, which is somewhat perverse. Oddly enough one of these 1,147 people died of '*apparent death*'. No comment. Herewith the accumulated death counts for the most noteworthy entries under *General & administration site*...

Asthenia (32), brain death (2), cardiac death (4), chest pain (12), chills (15), condition aggravated (19), death (561), disease progression (2), disease recurrence (3), fatigue (51), foaming at mouth (2), general physical health deterioration (98), hyperpyrexia (10), hyperthermia (2), hypothermia (3), illness (2), influenza-like illness (5), malaise (77), multiple organ dysfunction syndrome (20), pain (8), peripheral swelling (2), pyrexia (131), sudden cardiac death (10), sudden death (180), systemic inflammatory response syndrome (4), terminal state (2).

...please note that these will sum to more than the 1,147 recorded cases since this is a condition count and not an individual case count.

## European Deaths Following COVID-19 Vaccination by Product

| Percentages by Reaction Group     |         |        |             |         |      |
|-----------------------------------|---------|--------|-------------|---------|------|
| As at 27th March 2021             | Moderna | Pfizer | AstraZeneca | Janssen | ALL  |
| Blood & lymphatic system          | 0%      | 1%     | 4%          | 0%      | 1%   |
| Cardiac                           | 10%     | 11%    | 12%         | 50%     | 11%  |
| Congenital                        | 0%      | 0%     | 0%          | 0%      | 0%   |
| Ear & labyrinth                   | 0%      | 0%     | 0%          | 0%      | 0%   |
| Endocrine                         | 0%      | 0%     | 0%          | 0%      | 0%   |
| Eye                               | 0%      | 0%     | 0%          | 0%      | 0%   |
| Gastrointestinal                  | 3%      | 5%     | 4%          | 0%      | 5%   |
| General & administration site     | 44%     | 35%    | 37%         | 50%     | 37%  |
| Hepatobiliary                     | 0%      | 0%     | 0%          | 0%      | 0%   |
| Immune system                     | 0%      | 0%     | 0%          | 0%      | 0%   |
| Infections & infestations         | 6%      | 10%    | 8%          | 0%      | 9%   |
| Injury, poisoning & complication  | 2%      | 1%     | 1%          | 0%      | 1%   |
| Medical Investigations            | 3%      | 4%     | 1%          | 0%      | 3%   |
| Metabolism & nutritional          | 2%      | 2%     | 1%          | 0%      | 2%   |
| Musculoskeletal                   | 2%      | 1%     | 1%          | 0%      | 1%   |
| Neoplasms                         | 0%      | 0%     | 0%          | 0%      | 0%   |
| Nervous system                    | 11%     | 8%     | 13%         | 0%      | 10%  |
| Pregnancy, puerperium & perinatal | 0%      | 0%     | 0%          | 0%      | 0%   |
| Product issues                    | 0%      | 0%     | 0%          | 0%      | 0%   |
| Psychiatric                       | 1%      | 1%     | 0%          | 0%      | 1%   |
| Renal & urinary                   | 1%      | 2%     | 1%          | 0%      | 1%   |
| Reproductive & breast             | 0%      | 0%     | 0%          | 0%      | 0%   |
| Respiratory & thoracic            | 9%      | 12%    | 9%          | 0%      | 11%  |
| Skin & subcutaneous tissue        | 1%      | 1%     | 1%          | 0%      | 1%   |
| Social circumstances              | 0%      | 0%     | 0%          | 0%      | 0%   |
| Surgical & medical procedures     | 0%      | 0%     | 1%          | 0%      | 0%   |
| Vascular                          | 4%      | 4%     | 4%          | 0%      | 4%   |
| Total                             | 100%    | 100%   | 100%        | 100%    | 100% |

Source: EudraVigilance European database for suspected adverse drug reaction reports  
<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

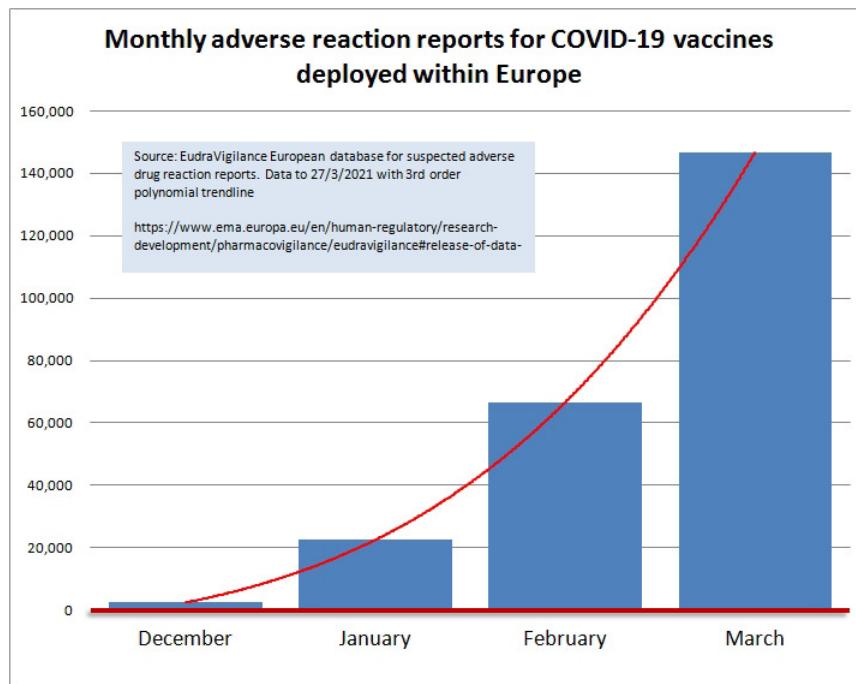
## EudraVigilance: Adverse Report Growth

An obvious ponder at this stage is on how bad things are likely to get in terms of folk reporting adverse events, including fatalities, as time goes along. This is not easy to answer since we don't have figures for vaccinations undertaken per product per week or per month. What I've done, therefore, is tabulate individual report counts for all four vaccines under trial and sum these into a grand total by month.

The attached figure should be largely self-explanatory but we should note that, unlike my previous analyses, these are monthly counts with the accumulated total for EEA and non-EEA zones standing at 238,427 adverse reactions as at 27<sup>th</sup> March 2021. The monthly growth curve at this early stage is near exponential but not precisely exponential, and I have fitted a third order polynomial trendline out of interest. Where this series is going to end up is anyone's guess.

Before we start to panic it is worth remembering that an adverse reaction might even be something as simple as crying after vaccination (63 reports of crying were noted after vaccination with the Pfizer product). Then again crying as an outcome may have preceded death or permanent injury, which will also be recorded against that adverse event so you can't dismiss these records by trivialisation. What we don't know is whether serious outcomes are rising in time at a near-exponential rate and this is a most serious shortcoming of the EudraVigilance reporting system. They have the data but they are not making it available.

Until such time as they do make this critical chart available I shall assume death remains a constant proportion of all adverse events and model this accordingly. Near-exponential death as a vaccine outcome isn't a pleasant prospect and neither is the potential burden on healthcare systems if beds start to fill with vaccine injured folk instead of COVID-19 cases. COVID didn't nail everybody but the government sure will.



### ***EudraVigilance: Bottom Line***

As at 27th March 2021 the EudraVigilance European database for suspected adverse drug reaction reports has recorded 5,355 deaths among 238,427 adverse events, this giving us a vaccination fatality rate of 2.2%. If we pull down the latest global figures from Worldometers.info we find 2,792,217 deaths among 127,495,412 cases, this giving us a COVID-19 fatality rate of 2.2%. We are between a rock and a hard place.

**29<sup>th</sup> March 2021**

### ***EudraVigilance: 'FLU JABS***

One of the major limitations of the EudraVigilance European database for suspected adverse drug reaction reports is that entry is not mandatory for vaccine products. The same is true of the Vaccine Adverse Event Reporting (VAERS) system of the CDC, an audit of which revealed that around 1 in 100 adverse reactions are voluntarily recorded. We have no idea of just how many adverse reactions to vaccines there are each year.

This prompted me to compare performance of the four COVID-19 vaccines under trial with performance from seasonal and non-seasonal influenza products being products that, according to the OECD influenza vaccination rate indicator, achieve 40% market penetration each year for the target population of the elderly and infirm. These products are supplied by six manufacturers (AstraZeneca, CSL Ltd, GlaxoSmithKline, Mylan, Novartis and Sanofi Pasteur) under 35 brand names from Aflunov to Vaxigrip Tetra.

All 35 brand name entries were sought within EudraVigilance and the total number of adverse reactions was derived for the 12 month period ending 27th March 2021. In sum a grand total of 3,115 adverse reactions were reported for a vaccine that achieves 40% market penetration on average. In comparison a total of 238,949 adverse reactions were reported for the four COVID-19 products currently under trial over the same period. I have no idea what the average market penetration of COVID-19 product vaccination is across Europe but it's not likely to be greater than 50%.

We may conclude that the adverse reaction reporting rate for all four COVID-19 vaccination products is currently running at 76.7 times the rate reported for influenza vaccination products. This is quite extraordinary. Medical authorities, government agencies and governments across Europe persistently claim that COVID-19 vaccination products have undergone rigorous testing and are safe to unleash on the public. The hard data tells us otherwise.

## WHO Rule 3

On 19th March 2021, under my post headed 'Jack In The Box', I pointed out some rather strange fluctuations in the historic series for annual deaths from influenza and pneumonia that ran from 1901 – 2019 (see attached slide). Suspecting cause of death coding changes I wrote to the Office for National Statistics who confirmed that this was indeed the case and who kindly directed me to documents explaining these changes in detail. The culprit turns out to be a ruling by the World Health Organisation known as 'Rule 3' - this rule changed the rules. Herewith extracts from an ONS national mortality status report dated 2006 that was laid before parliament that explains the changes...

*In general, the main change in introducing automated cause coding was in the interpretation of WHO Rule 3, one of the rules used to select the underlying cause of death. The interpretation of Rule 3 was broadened by OPCS in 1984, so that certain conditions that are often terminal, such as bronchopneumonia (ICD-9 485) or pulmonary embolism (ICD-9 415.1) could be considered a direct consequence of any more specific condition reported. The more specific condition would then be regarded as the underlying cause. This change in interpretation meant that deaths from certain conditions such as pneumonia declined in 1984, while deaths from conditions often mentioned in part II of the death certificate increased. The change in 1993 was thus to move back to the internationally accepted interpretation of Rule 3 operating in England and Wales before 1984. The effects of moving back to this earlier interpretation of Rule 3 have been discussed elsewhere. Deaths assigned to external causes were excluded from the Rule 3 change in 1984 because the procedures for assigning underlying cause of death based on coroners' verdict were unaffected by WHO rules.*

*The rule that changes cause of death statistics most is Rule 3. In ICD-10 the list of conditions affected by Rule 3 is more clearly defined than in ICD-9 and is also broader in scope. Its impact is to reduce the number of deaths assigned to certain conditions such as pneumonia and to increase the number of deaths assigned to chronic debilitating diseases. In England and Wales, about 20 per cent of deaths mention pneumonia so the effect of the change in Rule 3 is large.*

*1984 - OPCS decided to amend its interpretation of WHO Rule 3 in the assignment of underlying cause of death. This amendment is covered in more detail in section 3.2. It resulted in a decrease in the numbers of deaths coded to pneumonia and a few other causes, and an increase in deaths from many other conditions – most of the latter being small increases. The background to this change is given in the annual volume for 1984 in the DH2 series which includes a table assessing the numerical effects of changes, by underlying cause.*

*1993 - OPCS decided to revert to the internationally accepted interpretation of Rule 3 operating in England and Wales before 1984 (see section 3.2).*

*2001 - Introduction of the Tenth Revision of the International Statistical Classification of Diseases for coding cause of death on 1 January 2001. This replaced the Ninth Revision used from 1979 to 2000. There are some significant differences between the ICD versions. The main differences are:*

- *a change in format of the code and an expansion in the number of codes used*
- *a movement of some diseases and conditions between broad groups called ICD chapters*
- *changes to the rules governing the selection and coding of the underlying cause of death, especially Rule 3, which has had a large effect (see section 3.2)*

...so there you go, the reason for that Jack in the box graph is the WHO farting about, and here it is in B&W in a report laid before the UK parliament for all to see. This farting about greatly reduced how we go about counting deaths arising from pneumonia, and thus influenza-induced pneumonia. And there we all were thinking all those new 'flu vaccines were doing a grand job!

As a result the mortality series dating from 2001 is coded under WHO rule 3, which means fewer deaths from influenzal pneumonia than we used to count, which is why the current pandemic tends to look like a sore thumb. It looks even more like a sore thumb than usual because a few fingers have been chopped off by WHO. Whilst we have suppressed reporting of deaths due to influenzal pneumonia under WHO rule 3 we somehow have ignored this ruling when it comes to counting alleged COVID-19 deaths.

But this isn't the worst of it. That phrase 'automated cause coding' is another skeleton in the closet and I'll be flushing this monster out in the next episode.

## ***Automated Cause Coding***

In my post entitled 'WHO Rule 3' we discovered how a World Health Organisation ruling back in 1984 changed the way we count deaths such that counts of acute conditions such as pneumonia and influenzal pneumonia have been suppressed since 2001, thus making the pandemic look more impressive than it is. I promised to flush out a monster in the cupboard and will do so with extracts taken from an ONS national mortality status report that was laid before parliament in 2006. As you read these you'll see that what a qualified physician puts on a death certificate isn't what ends up in our national death registry and isn't what ends up in mortality statistics based on this registry. In sum, the ONS are providing mortality statistics based upon WHO rulings on causality and not what physicians are deciding is the underlying cause of death. Try these extracts for size...

### **4.7 Routine checks in Titchfield**

All deaths accepted onto the database that need routine coding are identified and coded as required. The detailed routine coding falls into five main areas:

- postcoding to give usual residence of deceased
- occupation, that is, the occupation of deceased/spouse where age of deceased under 75, or father where age of deceased under 16
- communal establishment coding for place of death of deceased
- place of birth of deceased
- cause of death

Causes of death are coded either through ACCS (see below) or by a manual process (for example, coroners' inquests). There are also routine checks of cause of death data. Those carried out monthly include:

- checking cause fields against inquest verdict fields for compatibility
- the presence or absence of original and final cause of death fields
- codes for ONS cause groups (see section 2.16) are present for neonatal deaths, and absent for non-neonatal deaths
- validity of suicides at very young ages
- mentioned conditions on death certificate are compatible with sex

Once coding of the cause of death is complete, checks are carried out on variables such as date of death, sex, year of birth, marital status and communal establishments. These checks evolve continuously during exploratory surveillance of data quality, and some of these are later incorporated as routine checks.

### **4.8 Automated Cause Coding System (ACCS)**

ACCS processes data for most deaths (see section 3.1) to derive codes for each medical condition on the certificate and to identify the underlying cause. The accuracy of automated coding is checked regularly by comparing it with the results of a ten per cent sample of randomly selected, manually coded records. Periodical reports on persistent coding problems are referred to a medical epidemiologist. They also provide feedback to NCHS (USA) and authors of the software to highlight areas of concern for the new releases.

### **4.9 Checks before and after extraction of data for analysis**

The first of these are carried out as a final check of what is held on the deaths database before an annual extract of data is taken. These comprise frequency checks for a range of fields, covering age, sex, underlying cause, and area of residence. Also checked are possibly incorrect combinations of fields. Any apparent errors or inconsistencies result in checks of individual cases by coders who make amendments, as required. Some of these checks are also carried out routinely every month. Further examinations are carried out once the data extract has been taken. They include checks similar to those done before extraction, to ensure that corrections made at that stage were properly carried out. After the annual extract used for mortality analyses has been produced as a dataset in a statistical computing package, a further set of frequency counts and two-way tables are prepared to ensure that no new errors have been introduced at this stage. These checks are to ensure that the frequency distributions are both valid and plausible and broadly similar to those for the previous year's data.

<https://webarchive.nationalarchives.gov.uk/20160108064004/http://www.ons.gov.uk/ons/rel/vsob1/mortality-statistics--deaths-registered-in-england-and-wales--series-dr-/2006/index.html>



**31<sup>st</sup> March 2021**

## ***EudraVigilance: 'FLU vs. COVID Jabs***

As I have already stated, one of the major limitations of the EudraVigilance European database for suspected adverse drug reaction reports is that entry is not mandatory for vaccine products. The same is true of the Vaccine Adverse Event Reporting (VAERS) system of the CDC, an audit of which revealed that around 1 in 100 adverse reactions are voluntarily recorded. We have no idea of just how many adverse reactions to vaccines there are each year.

This prompted me to compare performance of the four COVID-19 vaccines under trial with performance from seasonal and non-seasonal influenza products being products that, according to the OECD influenza vaccination rate indicator, achieve 40% market penetration each year. These products are supplied by six manufacturers (AstraZeneca, CSL Ltd, GlaxoSmithKline, Mylan, Novartis and Sanofi Pasteur) under 35 brand names from Aflunov to Vaxigrip Tetra.

Another issue with EudraVigilance is all manner of adverse events are recorded, such that both crying and death following vaccination are counted. We might be tempted to trivialise this situation by stating that a database that records a zillion sobbing people isn't telling us anything of clinical value but this is where we can come a logical cropper – some folk may have cried just before they died. So the issue here is *seriousness of outcome* and this is where EudraVigilance isn't that helpful because there is only one complicated graph that doesn't enable us to quantify the situation. I have thus worked my way through 27 reaction groups and manually counted fatal outcomes for each vaccine under investigation to get some actual numbers.

All 35 'flu vaccine brands were sought within EudraVigilance and the total number of adverse reactions was derived for the 12 month period ending 27th March 2021. In sum, a grand total of 3,115 adverse reactions were reported of which 13 were fatal, this giving us an adverse report fatality rate of 0.42%. In comparison, a total of 238,949 adverse reactions were reported for the four COVID-19 products currently under trial over the same period, of which 5,355 were fatal, this giving us a 2.24% adverse report fatality rate. The difference between these two rates is highly statistically significant at  $p < 0.0001$  (Poisson rate comparison), with fatal outcomes being 5.4 times more frequently noted for COVID-19 biological products than their standard 'flu jab counterparts. In terms of volume of reports entered onto the system we find 77 times more adverse reaction reports for COVID jabs than 'flu jabs, and 412 times more reports of fatalities. You read that right – 412 times more reports of fatalities; and this for an allegedly 'safe' yet novel vaccine that is still subject to clinical trial.

I am not sure why this isn't ringing alarm bells with every nurse, every physician, every pharmacist, every clinical researcher, every professor, every NHS executive, every senior grade within PHE, every senior officer within DHSC, every member of parliament, every journalist, every news channel, every medical journal, every pharmaceutical executive and every member of the public who cares to stop and think. Have people gone insane?

**1<sup>st</sup> April 2021**

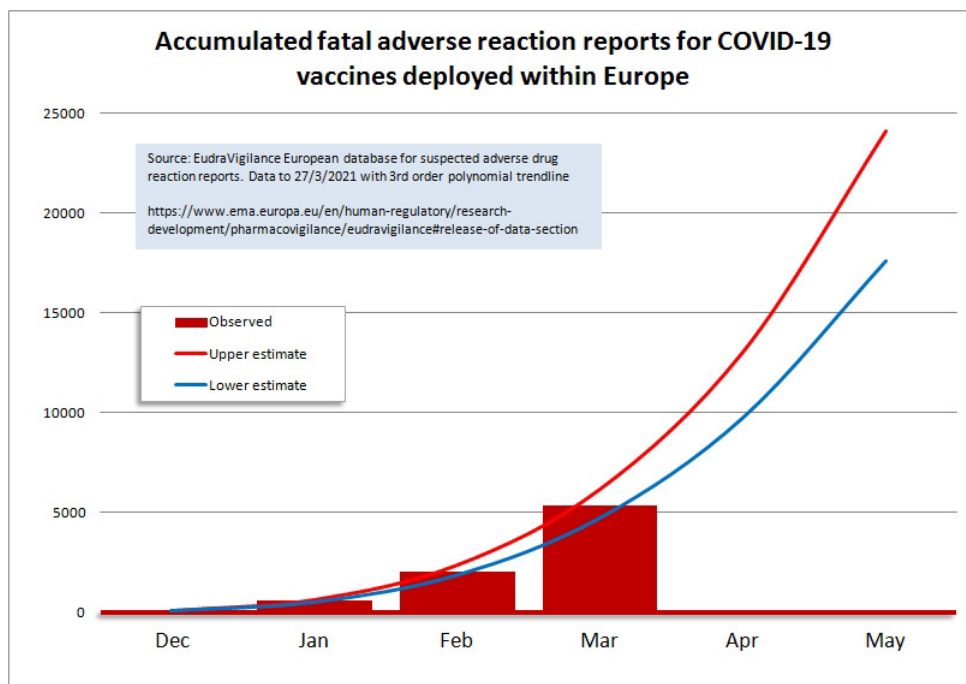
## ***Doing A Neil***

If Professor Neil Ferguson of Imperial College, London, can produce wild predictions of deaths from COVID-19 using dodgy assumptions that then go on to influence the entirety of UK government policy then I thought that, on this first day of April, I'd do the same for fatal reactions to vaccines.

As at 27<sup>th</sup> March 2021 the EudraVigilance European database for suspected adverse drug reaction reports indicated 5,355 deaths amongst 238,949 adverse reports for the four COVID-19 biological products under trial. By taking this ratio of one death per 45 reports we can then estimate how many accumulated deaths have occurred for each of the months of December 2020, January 2021, February 2021 and March 2021 (EudraVigilance does not provide this critical breakdown). With those four numbers in the pot we can then do a bit of statistical modelling to see what mathematical function best fits the data.

It turns out that a power series is the very best fit with an R-square of 1.000 and expansion coefficient of 3.3 ( $p < 0.001$ ). In plain English this means the accumulated number of deaths has been following a near perfect triple power series, which is going some. With this best fit function in the pot we can now ask it to predict the number of accumulated deaths that are likely in the coming months. The answer is displayed graphically and we now see that we can expect around 20,000 fatal reports within EudraVigilance come the end of May.

If we really want to scare folk (like the mainstream media and their favoured experts prefer to do these days) we can do the 'full Neil' and predict the number of fatal reports that will be lodged within the EudraVigilance European database for suspected adverse drug reaction reports come the end of next December. My model predicts we shall see between 213,612 and 330,853 deaths across Europe following vaccination with COVID-19 biological products. This may be the first of April but this is not an April Fool.



**2<sup>nd</sup> April 2021**

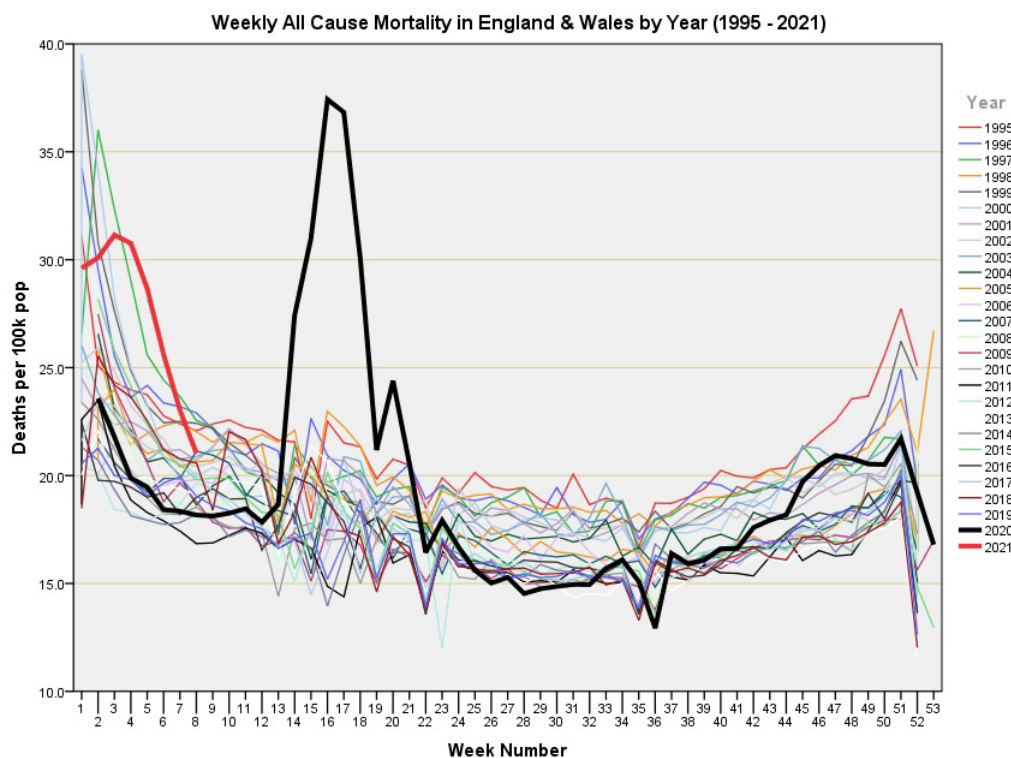
### ***Yes, But Where Are We Now?***

This is the question my wife always asks whenever I ramble on about such and such statistic. Like many people she's not keen on statistical mumbo-jumbo so I sat and devised a colourful chart for her so she can see exactly where we are at in terms of the weekly all cause mortality rate (deaths per 100,000 population) for England and Wales. I could smother this plot in fine lines going back to 1970 but decided 1995 would be historic enough to get the point across.

We can now see that 2020 was a scary year but only for a very short space of time between weeks 14 (w/b 28<sup>th</sup> March 2020) and week 20 (w/b 9<sup>th</sup> May 2020). This peak, coming as it did at that time during early Spring, was rather peculiar indeed, though it is by no means unique since scary peaks of similar magnitude may be observed during January for a bunch of years. So the peak isn't peculiar but its timing sure is!

After this somewhat scary Spring peak it is worth noting just how well the weekly mortality rate beds down into the mass of historic data, even hugging the bottom during the warm summer when thousands of allegedly irresponsible people took to the beaches. Evidence-wise I would suggest this was far from irresponsible and rather effective medicine for folk who had been cooped-up like chickens.

We can now also see the first eight weeks of 2021 in historic context, which reveals nothing special is going on. This is all the more remarkable given we've all but closed down the NHS for over a year, with suicides rocketing. I shall be updating this chart again soon and my guess is that, at week 13 we are going to be down in that tangle of colourful spaghetti once more.



Source: Office for National Statistics

### ***What Does 90% or 95% Effective Mean?***

When vaccine manufacturers claim a vaccine is "90% effective" (or even "95% effective" in the case of Pfizer's product) please do bear in mind that this is an estimate of relative risk as opposed to absolute risk, and can be somewhat misleading for the general public who will interpret this as "if I have the vaccine I'm 90%/95% certain of not getting COVID" - this is not what "90%/95% effective" means.

By way of example Pfizer's famous "95% effective" claim is a simple measure of relative risk. A total of 8 of their vaccinated group of 18,198 participants went on to develop COVID-19 (0.044% risk), whereas a total of 162 of their un-vaccinated group of 18,325 participants went on to develop COVID-19 (0.88% risk). The relative risk reduction calculation is thus  $100 \times 1 - (0.044/0.88) = 95\%$ , whereas the absolute risk reduction is a mere  $0.88 - 0.044 = 0.84\%$ .

Thus, if you were a vaccinated subject in Pfizer's trial, there was a 99.96% chance you didn't develop COVID-19. Whereas if you were an un-vaccinated subject there was still a 99.12% chance you didn't develop COVID-19, the difference being the absolute risk of 0.84%. Thus we see that vaccination using Pfizer's product actually reduces risk to the public by less than 1% and not 95%.

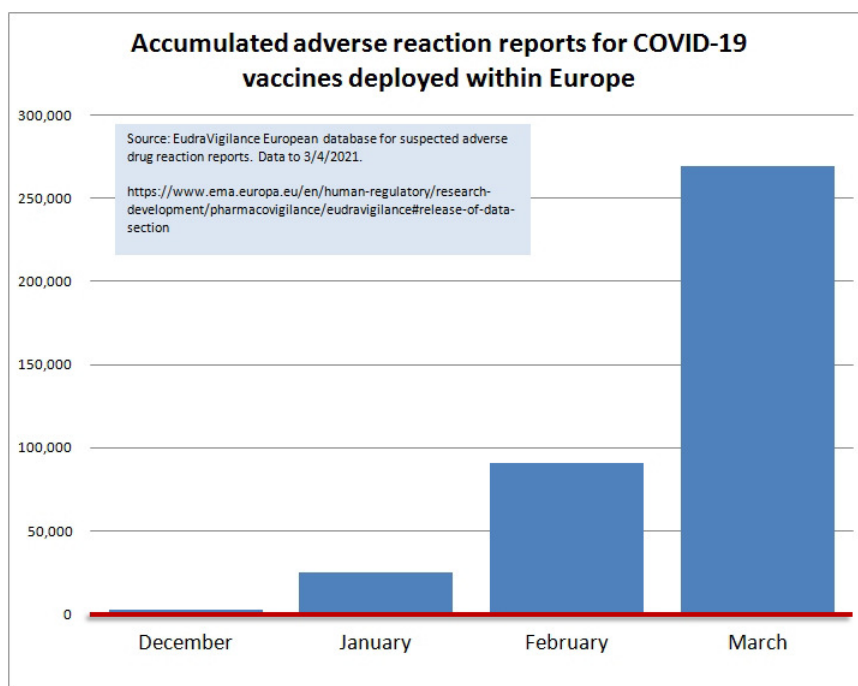
**6<sup>th</sup> April 2021**

### ***EudraVigilance Latest***

As at 3<sup>rd</sup> April 2021 the EudraVigilance European database for suspected adverse drug reaction reports indicated 5,993 deaths amongst 272,781 individuals for whom adverse reaction reports for the four COVID-19 biological products under trial have been filed, this representing a fatal report rate of 2.20%. Over the same timeframe a total of 3,116 adverse individual reactions to standard 'flu shots were reported across Europe, of which just 13 were fatal, this giving us fatal report rate of 0.42%.

The 272,781 individuals reporting adverse effects following vaccination with COVID-19 biological products generated 346,790 non-serious and 362,544 serious reactions, making a total of 709,334 registered adverse reactions between them, this equating to a mean reporting rate of 2.6 suspected adverse reactions per individual.

According to OECD data 'flu vaccination rates for the target population of 65+ years has been running at around 40% market penetration across Europe, on average, for the last three years. Assuming broad comparability with current COVID-19 levels of market we find 88 times more adverse reports following vaccination with COVID-19 biological products and 461 times more reports of fatalities. EudraVigilance was established to track outcomes for novel drugs yet I don't see any evidence of this valuable data being used to alert governments and their respective health authorities to what is clearly alarming levels of adverse outcome.



7<sup>th</sup> April 2021

### ***Putting The Boot In***

I have just booted a new member (Martin Usiskin) for his unnecessarily aggressive and somewhat ignorant response to my post of 6th April, entitled 'EudraVigilance Latest'. Whilst he correctly pointed out that the 5,993 deaths and 272,781 adverse reactions represent the merest fraction of the vaccinated population of 75,009,654 European folk (fetching up at 0.008% and 0.364%, respectively) he failed to see the main point of the entire analysis, this being an alarming number of fatalities and adverse incident reports \*compared\* to the standard 'flu jab.

He also failed to grasp that the *raison d'être* of EudraVigilance is to track suspected adverse reactions in order to detect what may or may not be an underlying problem with a novel drug. To gloss over this and claim all is well because 99.636% or even 99.992% of the vaccinated population appear to be fine and dandy after a couple of months is utterly irresponsible. A tremendous hidden problem may be building but there again it may not – the idea behind evidence-based medicine is to fucking well find out.

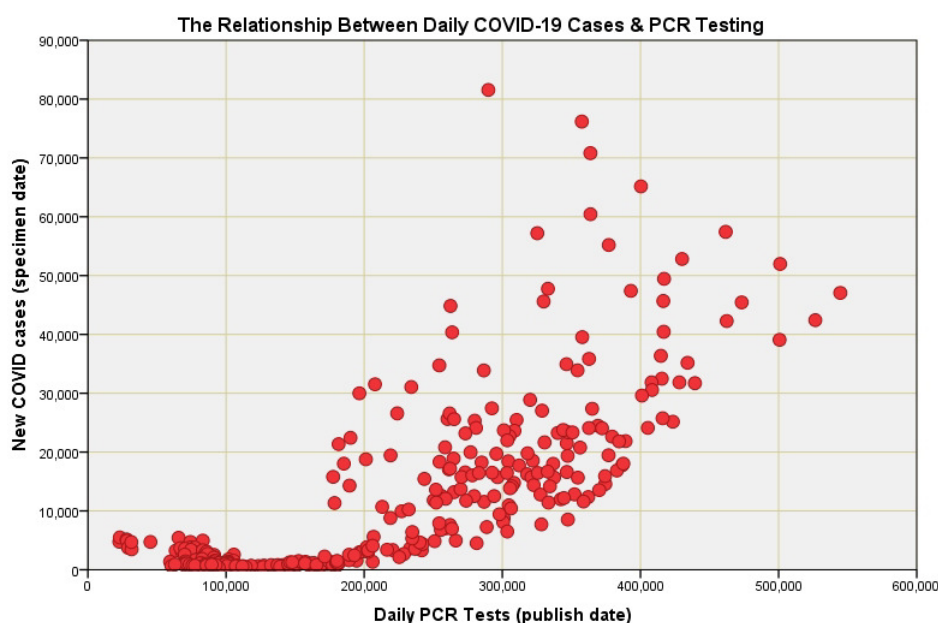
### ***The PCR Paradox***

A basic fact of life that escapes all government organisations and most experts is that, all things being equal, the more we test folk the more COVID-19 cases we are likely to find. An analogy is that we can pack more socks into a truck than a handbag; the packing density of socks per square foot may be the same but there's more socks in the truck simply because it's bigger. Then again we could be perverse with our packing and throw just a few pairs in the truck whilst cramming a dozen into our handbag. This distinction between container size and packing density should be obvious to most people but when it comes to a virus lurking within a population logical reasoning goes out of the window.

If we want to make a claim that cases are increasing we need to account for the test rate. If we want to make a claim that cases are decreasing we need to account for the test rate. If we want to make a claim that hospital admissions are increasing we need to account for the test rate. If we want to make a claim that hospital admissions are decreasing we need to account for the test rate. If we want to make a claim that 28-day positively identified COVID-19 deaths are increasing we need to account for the test rate. If we want to make a claim that 28-day positively identified COVID-19 deaths are decreasing we need to account for the test rate. If we want to make a claim that cases among teenagers are higher than for adults we need to account for the test rate. If we want to make a claim that cases within certain regions are higher than other regions we need to account for the test rate. If we want to make a claim that mask wearing and lockdown policies are beneficial we need to

account for the test rate. So how many glossy and somewhat authoritative government charts out there in the land of social media portray data that have been adjusted for test rates in an appropriate manner? Exactly.

What I am going to do over the next few posts is use statistical modelling techniques to unpick this PCR paradox so we may get a feel for what has actually been going on once we account for varying levels of testing over time. To kick us off I've produced this simple scatterplot for the period 21<sup>st</sup> April 2020 – 28<sup>th</sup> February 2021 that shows the relationship between volume of daily tests undertaken and the number of new COVID cases detected. This is not a simple relationship by any means but our eyes are already telling us that, in general, the more tests we do the more cases we are capable of detecting. In this sense 'capable of detecting' means exactly that – it doesn't necessarily mean higher levels of infection within the community, which is an entirely different matter. This is something we shall examine in the next episode.



Source: <https://coronavirus.data.gov.uk/> Period: 21-4-20 to 28-2-21

8<sup>th</sup> April 2021

### ***Yes, But Is It Worth It?***

In my recent post entitled '*EudraVigilance Latest*' and a follow up, entitled '*Putting The Boot In*', we got to see that suspected adverse reaction reports for COVID-19 biological products was outstripping those for the standard 'flu jab but that incidence of a fatal outcome amongst the vaccinated population was extremely unlikely. We could argue, like many experts and authorities do, that the risk of death from COVID-19 far outweighs the very small additional risk of taking a novel vaccine that is essentially still under trial. This morning I shall undertake a back-of-the-envelope calculation just to check that this conclusion is sound.

As at 3/4/21 EudraVigilance was reporting 5,993 fatalities following vaccination with COVID-19 biological products, whilst the European Centre for Disease Prevention and Control was reporting 75,009,654 administered doses on 6/4/21. Putting the two together we arrive at a crude vaccination fatality rate of 0.008%. For the moment we shall ignore the thorny issues of causality, death certification, under-reporting and timescale (not everyone who is going to die will have died).

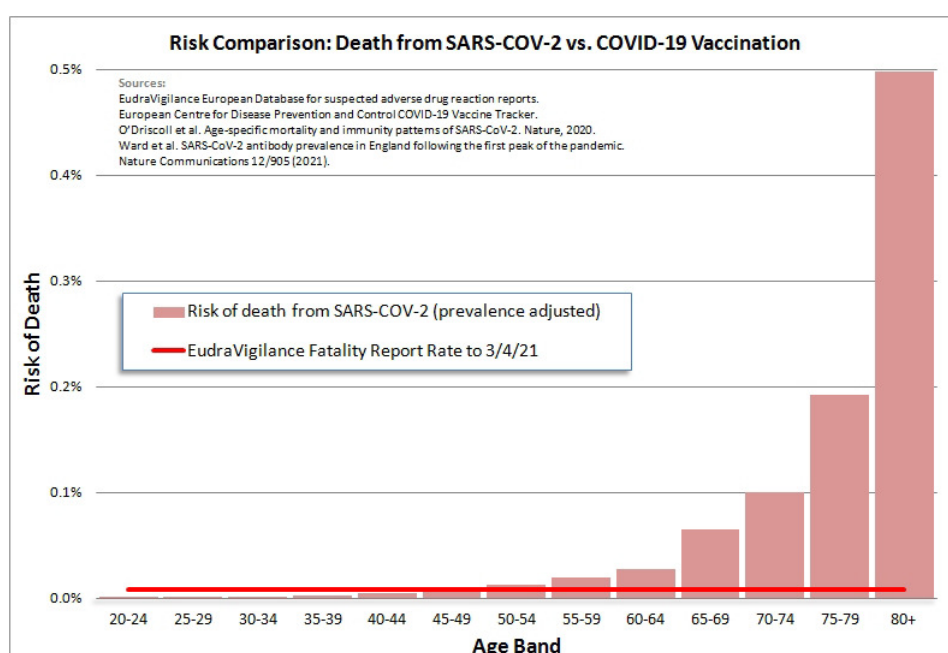
What we need now are decent estimates of the infection fatality rate (IFR), and I can find no finer paper than that of O'Driscoll et al (Age-specific mortality and immunity patterns of SARS-CoV-2. *Nature*. DOI: 10.1038/s41586-020-2918-0. 2020). Rates start out at a mere 0.001% for children aged 5 – 14, rising to a rather scary 8.292% for adults of 80+ years. Knowing the infection fatality rate is important because, at the outset of the pandemic, experts worldwide went about quoting case fatality rates (CFR), which are always much higher for any disease. Think of a case as somebody already ill in hospital as opposed to somebody at home not realising they are carrying the virus and you should get a grip on the difference. The IFR is the rate that answers the question that has been on everybody's lips - "what is my chance of dying if I get infected" – unfortunately, these lower rates were not available at the outset, so folk got hammered with alarming figures for hospitalised case fatality.

It would be tempting to wade straight in and compare the 80+ IFR of 8.292% with 0.008% and exclaim “no brainer, you are 1,038 times more likely to die of the virus than the jab!” Except we can’t sensibly do that for the decision to take a jab provides 100% certainty of biological outcome, whereas not everybody manages to contract the virus in the first instance. We thus need a further nugget of information, this being likelihood of infection and this will depend on prevalence.

Estimating the population point prevalence of SARS-CoV-2 Infection is seriously tricky thing to do and I have yet to find a satisfactory paper that covers a broad section of the population for several European nations over a decent timescale using a standardised methodology. The best I can muster is a paper by Ward et al (SARS-CoV-2 antibody prevalence in England following the first peak of the pandemic. Nature Communications 12, Article number 905. 2021) who report on a national study of over 100,000 people. After adjusting for test characteristics and re-weighting to the population, this team estimated overall antibody prevalence at 6.0% (95% CI: 5.8-6.1). As Ward points out “England has experienced a large outbreak of SARS-CoV-2 infection leading to the highest excess mortality in Europe by June 2020” – so this isn’t some flimsy situation.

With that 6.0% for population prevalence in our pot we can now estimate the likelihood of death from SARS-COV-2 for the most elderly sector of the population, this being  $8.292\% \times 6.0\% = 0.498\%$ . Comparing this figure to the somewhat general estimate of 0.008% for post-vaccine fatality across all age ranges across Europe we see that it is still a no brainer, with the virus 62 times more likely to result in death for this age group.

So what about somebody aged 40-44, what then? I have decided to answer this with a colourful bar chart that is derived from the IFR data provided by O’Driscoll et al, and factored by Ward et al’s estimate of 6.0% prevalence. That big red line represents the EudraVigilance suspected adverse drug reaction fatality report rate of 0.008%. This is the best shot at the big question I can muster at present but as data rolls in I’ll be refining my methodology. Assumptions underpinning this are legion and, unlike experts, I’m happy to admit this. We can now stick our wet finger in the air, look at our envelope and declare vaccination with COVID-19 biological products to be an unnecessary risk for those under 50 years of age. It will be interesting to see the sort of calculations that various professors and committees are making and, of course, it will be interesting to see how things finally pan out a few years from now.



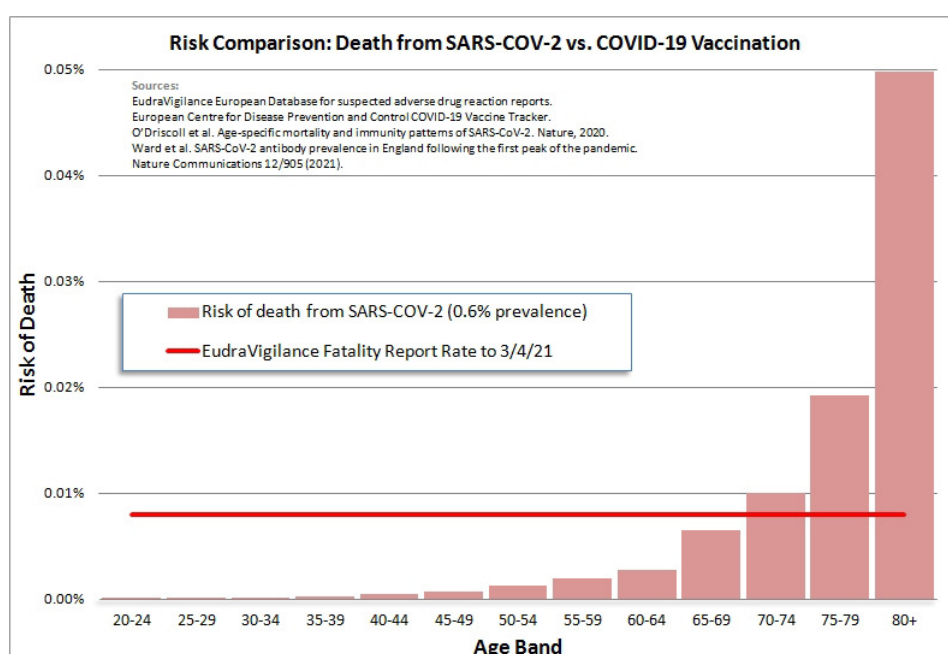


## Beyond The Peak

In my post entitled 'Yes, But Is It Worth It?' I ran a rough and ready back-of-envelope calculation so we may begin to compare the very small risk of fatal outcome following vaccination with COVID-19 biological products against the risk of fatal outcome following infection with SARS-CoV-2. We acknowledged that this calculation floated on a vast raft of assumption and it was most pleasing to see some of these washing out in comments. Notwithstanding curveballs such as lack of evidential proof that the SARS-CoV-2 virus actually exists as an exogenous pathogen as claimed, and that said pathogen is causal in development of the condition known as COVID-19, and that said condition is monocausal, I shall hurl another curveball into the arena by pointing out that the analysis undertaken hinged on an assumed peak viral prevalence of 6.0% that was estimated across the badly hit nation of England by Ward et al.

What happens beyond the peak? I have no idea but I do know that our key decision graph is going to change dramatically. To illustrate this I have drawn the graph again but I've assumed, simply for the sake of argument, a post-peak prevalence of 0.6% (i.e. 6 out of every 1,000 people possessing antibodies). For some of us a local prevalence of 0.6% was all we ever encountered, and for some folk exposure would have been even less: prevalence is a personal thing.

We now reach a rather shocking conclusion that vaccination with COVID-19 biological products is an unnecessary risk for those under 70 years of age. Just how sound is the science behind all these momentous decisions on public health?



9th April 2021

## Latest UK Position

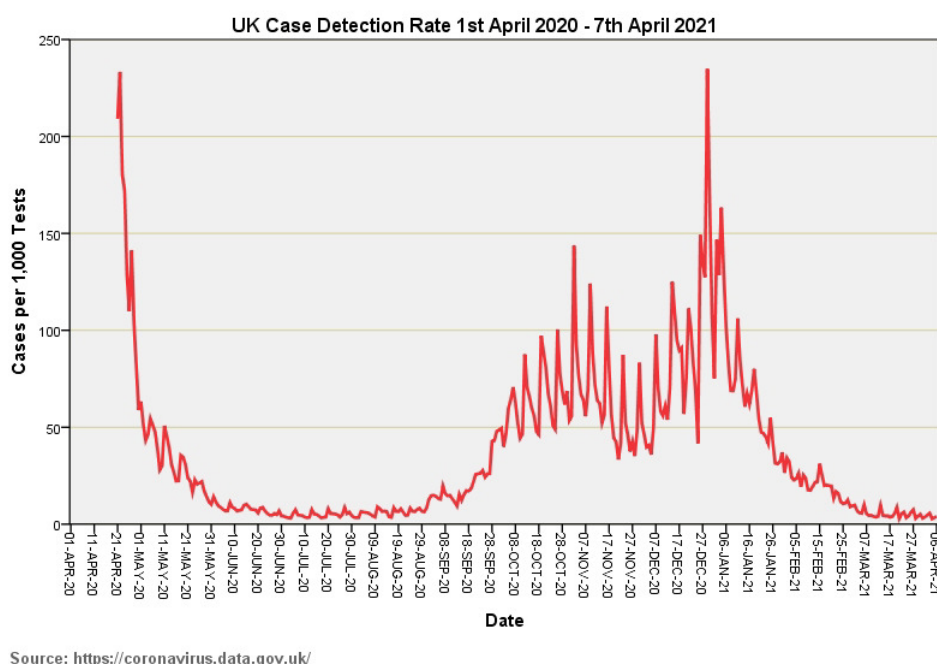
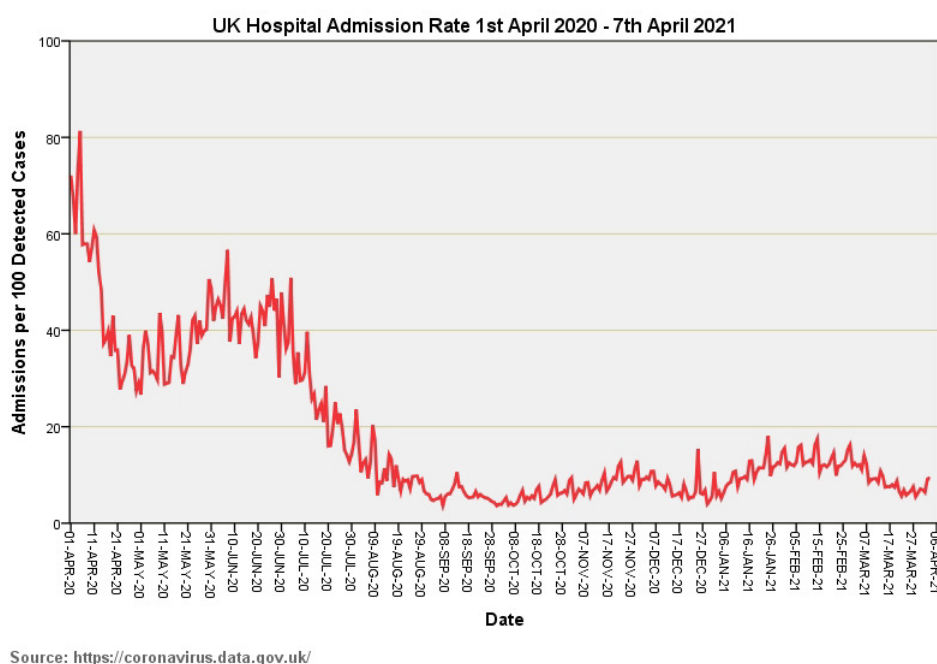
I am in the process of updating my database with the latest official figures pulled down from the UK Government's coronavirus dashboard and thought I'd knock out three indicators to reveal where we are now at in terms of cases, hospital admissions and case fatality. If I were a government information officer I'd do the usual trick of knocking out slides of raw counts in order to dramatise the situation. Being a gentle sort of chap who likes to play a straight bat I have instead produced slides in terms of rates. I thus present cases per 1,000 tests instead of total cases, hospital admissions per 100 detected cases instead of total admissions and a 28-day rolling case fatality rate instead of total deaths. The latter is a modification of the standard cumulative case fatality rate that gives us a bit more idea as to what is actually going on by using a 28-day rolling 'window'.

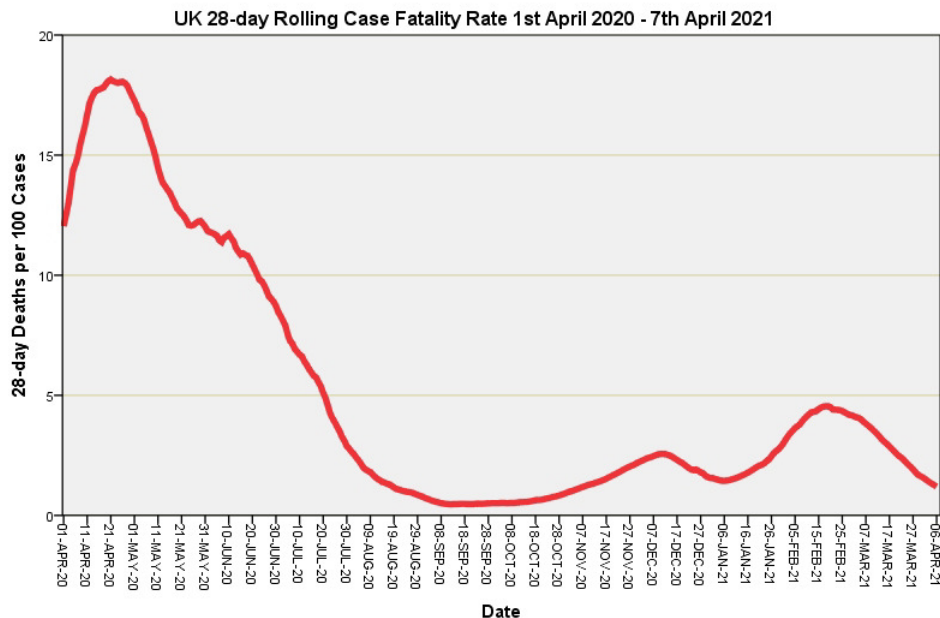
I am hoping these three slides are pretty self explanatory but I will point out a few key features. In the first slide (cases per 1,000 tests) we see the infamous "second wave" isn't doing anything different to the first wave – it's just that we undertook a load more PCR tests that bumped the total numbers up. Unfortunately Joe Public didn't spot that game. Once test volume is accounted for we get a feel for what likely has been going on. I say 'likely' because the PCR test is not fit for purpose as a diagnostic; I shall remind folk that a case isn't necessarily somebody lying critically ill in hospital but anybody who tests positive just once – they may not feel unwell, they may not be infectious and they may not be

carrying any virus (false positive). The next game to be played will be attributing the seasonal decline to the vaccine, but I have a few statistical weapons up my sleeve in readiness.

Turning to the next slide we now get a feel for what has likely been going on in terms of folk actually getting unwell (as opposed to merely testing positive). It's pretty clear that folk were rather unwell with something back in April 2020, then again most curiously in June 2020, but after that we are likely looking at the normal ebb and flow dominated by respiratory disease. Quite what these alleged new variants are up to is anyone's guess but they look relatively harmless from the perspective of hospital intake.

Turning to the final slide we can clearly see that death isn't what it was. There's a couple of recent bumps that may well be seasonal peaks but there is also the mysterious and somewhat alarming climb as more and more elderly folk were vaccinated during January and February 2021. Has the vaccine rollout generated excess death among the most frail and elderly?





Source: <https://coronavirus.data.gov.uk/>

### ***COVID-19 vaccines have prevented 10,400 deaths in older adults***

This is the claim proudly put out today by Public Health England, being the findings of a report entitled '*Impact of COVID-19 vaccines on mortality in England December 2020 to March 2021*'. A bold claim, and one that would seem entirely reasonable to an expectant Joe and Josephine Public, except that I have obtained a copy of the report and checked the methodology. I cannot believe what I have just read.

The assumption everyone is going to make is that the mortality rate for older adults has been in decline since vaccine rollout and that this decline reveals an accumulated negative excess of 10,400 deaths compared with what we normally would expect for this time of year. Bravo vaccine! Except this is not the calculation they have made.

What they've gone and done is take the observed number of 28-day COVID-19 deaths then attempted to derive the expected number of deaths by reducing the observed death count using estimates of vaccine effectiveness and vaccine uptake. This is what we call circular reasoning and, by definition, they're going to create a net saving no matter what! An analogy is cutting and inch off your home-grown gherkins in order to claim first prize in the smallest gherkin competition. For those who like equations the gherkin at the centre of this prize folly is:

Saving in deaths = observed deaths – (observed deaths/vaccine effectiveness x vaccine uptake)

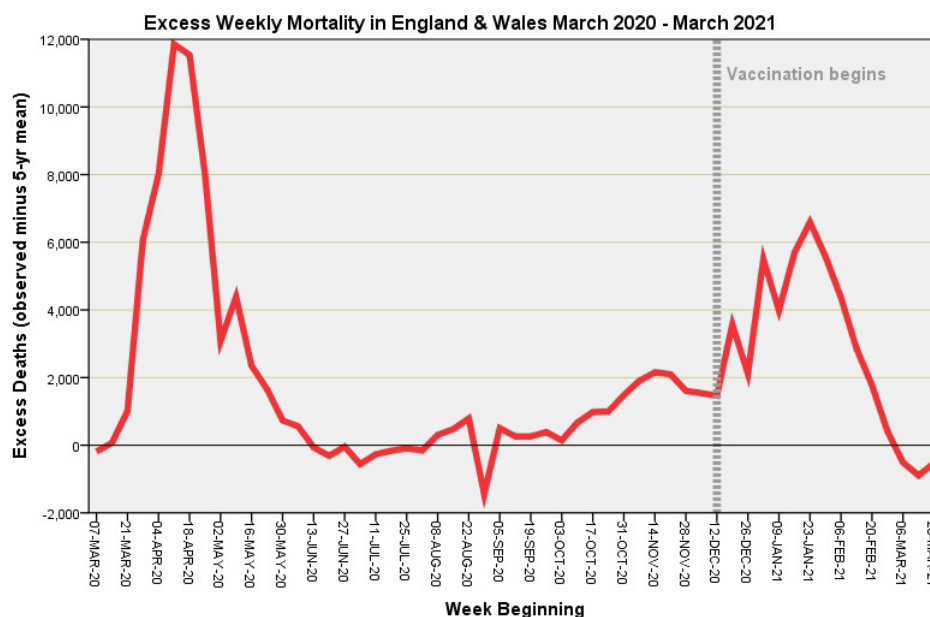
But that's not all! We must also note that PHE's analysts have chosen 28-day positively identified COVID co-morbid death over certified causal COVID death (death certificate section I), which means two things:

1. The number of deaths will depend on the number of PCR tests undertaken (we tend to identify more 28-day deaths when the swabs are flying), and since the test rate is now in decline after the December swab frenzy, so will the number of positively identified 28-day deaths.
2. PHE's analysis has nothing to do with COVID as the primary cause of death.

Let's hit a final nail into the lid by revealing what happens when you adjust for excess deaths using empirical data instead of circular reasoning and estimation. In this instance we are looking at the observed count of weekly registered all cause death minus the average death count for the same week for the preceding five years. We now see an alarming climb in all cause mortality from the very start of vaccination rollout. To be fair this may be due to normal seasonal variation in deaths as well as fatal reaction to COVID-19 biological products and, of course, it may be due to a surge in COVID-19 deaths - but if the latter what has the vaccine being doing other than making somebody rich?

As time permits I shall be teasing these issues out using a variety of statistical tools. What I won't be doing is using circular reasoning.

[https://www.gov.uk/government/news/covid-19-vaccines-have-prevented-10-400-deaths-in-older-adults?fbclid=IwAR1leRBL\\_WsSKUtKl8\\_XuFKVtAAZuFmOE3u9SeP0T2KIWfiwODk6eOVQPXk](https://www.gov.uk/government/news/covid-19-vaccines-have-prevented-10-400-deaths-in-older-adults?fbclid=IwAR1leRBL_WsSKUtKl8_XuFKVtAAZuFmOE3u9SeP0T2KIWfiwODk6eOVQPXk)



Source: Office for National Statistics

10th April 2021

### ***Findings from the latest COVID-19 REACT-1 study***

- Over 140,000 volunteers were tested in England between 11 to 30 March 2021 as part of one of the most significant COVID-19 studies in the world
- Findings from Imperial College London and Ipsos MORI show infections fell by approximately 60% from the last REACT study in February, with only 1 in 500 people infected
- Data suggests infections have led to fewer deaths since December, which coincides with the vaccination rollout and 'Stay at Home' rules during this period
- Prevalence of infections has now plateaued, showing it is critical everyone continues to follow the guidance and rules to help control the epidemic

Are these results real? Let's go find out...

Another key report timed to coincide with the vaccines-are-wonderful-and-so-is-Boris campaign is this one by Imperial College and MORI (yes, *that* Imperial College). I first commented on the dubious methodology of this study last year after reading the pre-print copy that revealed the RT-PCR test had been largely relied upon to determine prevalence. That wasn't my only bone of contention for they'd gone and sampled folk living in hotspots and selected candidates over the age of 16 who'd previously engaged in COVID and other studies – in other words the sampling frame was heavily biased from the outset.

But this wasn't the full extent of the problem... they were taking seroprevalence results as indicative of *current* levels of disease, whereas every lab technician worth their salt will realise seroprevalance tells us about our pathological *history*. In plain English, people testing positive for antibodies this very morning could easily have recovered from an infection occurring last year. If anything, serological studies tell us everything about *national accumulative disease prevalence since the pandemic began* and nothing about point prevalence, the latter being a measure of where the disease is today. This is why the REACT crew roped in RT-PCR and this is where the study runs into trouble.

By way of example, for a test sensitivity of 80% and specificity of 99.9%, and with disease prevalence at 0.1% (1 in every 1,000 people), the false positive rate for the RT-PCR test will be 55.5%, i.e. just over half of the new cases declared will have been declared in error. If disease prevalence is down at 0.01% (1 in every 10,000 people) then the false positive rate for the RT-PCR test will be an incredible 92.6%. Thus we see that the study is built on a rather large pile of falsely positive swabs, giving rise to inflated estimates of point prevalence. Unless Imperial has some magic way of adjusting for this intrinsic bias we may as well bin both the first and second reports. The shrewd reader will also fathom that over time the false positive rate will also change, such that at the tail ends of infection outbreaks we will be recording proportionately more false positives. Thus we see that positive case reporting bias within the REACT trial will have changed over time, yet nowhere in the pre-print do we see any attempt to adjust for this.

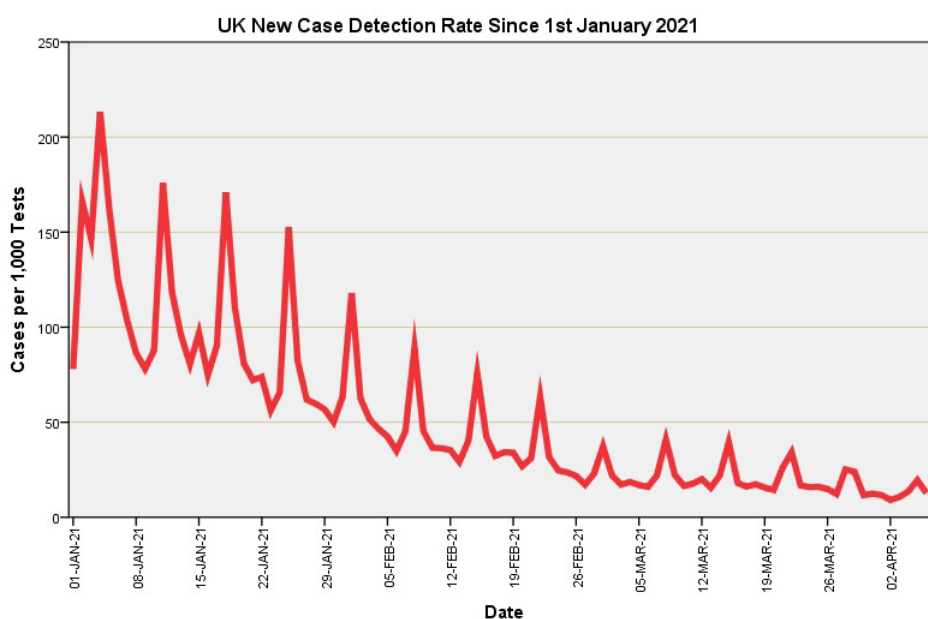
But that's not the end of it. On 14<sup>th</sup> December 2020 the World Health Organisation finally admitted a major problem with testing and issued guidelines asking IVD labs to lower their adopted PCR cycle threshold (Ct/Cq) owing to floods of false positive results. Assuming UK labs eventually got on board and followed this advice the number of positive PCR results (both false and true) would have diminished by design during January/February, yet it would have looked for all the world like COVID outbreaks were in decline, with the bold presumption that the virus was chased down by successful lockdown policies and effective vaccines. The world-leading REACT trial sat right in the middle of this charade, also taking up the narrative that things are looking better without questioning the basis upon which lab results are generated. I have run out of face to palm.

What makes this all the more astonishing is that MIQE guidelines (Minimum Information for Publication of Quantitative Real-Time PCR Experiments) were laid down in 2009 to ensure reliability and integrity of PCR results. MIQE clearly states "Cq values  $\geq 40$  are suspect because of the implied low efficiency and generally should not be reported", yet this didn't stop UK labs running ridiculous Cq levels of 41, 44 and even 45 and pretending these were real results; this is why I started out by asking how real these results are. The answer seems to be not very. But what of the incredibly robust methodology that was surely adopted for this second and most critical report? We need look no further than the pre-print abstract, which states

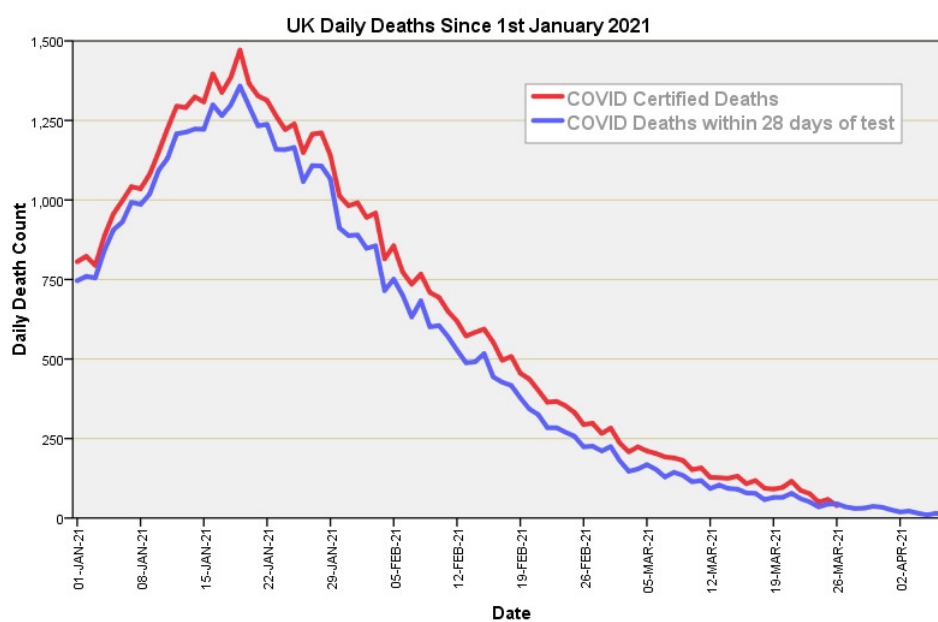
*The Real-time Assessment of Community Transmission-1 (REACT-1) study augments routine surveillance data for England by measuring swab-positivity for SARS-CoV-2 in the community. The current round, round 10, collected swabs from 11 to 30 March 2021 and is compared here to round 9, in which swabs were collected from 4 to 23 February 2021.*

But let us give the study the benefit of the doubt and have a little look at some data, starting with the daily detection rate for new UK cases since 1<sup>st</sup> January. Now this first slide sure supports what Imperial/MORI are saying. If we compare the February mean rate of 42.69 new cases per day with the March mean rate of 20.50 new cases per day we discover a reduction of 52% which isn't far from Imperial's claim of a 60% reduction based on a sample of 140,844 swabs. Whilst we can warmly agree on a substantial decline in disease prevalence what we can't go round doing is being all political and claiming this decline is due to lockdown strategies and vaccine rollout. This may indeed be the case but it may also be the case that this is the natural seasonal decline we may observe with all other coronaviruses. It may also be the case that the decline is due to nothing more than lowering of Cq thresholds following issuing of WHO guidelines on 14<sup>th</sup> December. There are some statistical techniques I can employ in an attempt to unravel these confounding variables and I shall be reporting on these in future posts.

One statement I must take umbrage with is the claim 'Data suggests infections have led to fewer deaths since December, which coincides with the vaccination rollout and 'Stay at Home' rules during this period.' I shall explain why by producing a second slide revealing the daily number of certified COVID deaths ('certified' means COVID is mentioned on any part of the death certificate, so may be causal or a co-morbidity) and the daily number of 28-day positively identified COVID deaths (these rely on a PCR test result). In this second slide we clearly see an initial RISE in the number of COVID deaths following vaccination rollout and 'stay at home rules' and should enquire as to whether these two factors have led to excess deaths. If initial shots were given to the most vulnerable and the vaccine was inducing severe adverse reactions in this group we would expect to see an increasing percentage of fatalities among these until such time as the most frail had passed over, after which we'd expect to see a decline in COVID-related deaths as healthier people started to receive their first dose. This delayed 'hump' is precisely what we see and the truth of the matter can easily be determined by studying a few thousand coroner's reports and medical case notes. As yet I see no official action on this front other than pithering about. Again there are some statistical techniques I can employ in an attempt to unravel the matter and I shall be reporting on these in future posts.



Source: <https://coronavirus.data.gov.uk/>



Source: <https://coronavirus.data.gov.uk/>

11th April 2021

### ***Mortality Trends in the Elderly (85+)***

I'm coming across arguments that attempt to dismiss deaths in the elderly. Statements such as "well, they were going to die soon anyway" or "they're a high risk group so we must expect more deaths" when combined with "uptake of the vaccine by the elderly has been disproportionately massive" permit experts to wave away any suggestion that the vaccines are ineffective in this group (thus leading to death from COVID) or, heaven forbid, that the vaccines are actually killing them. I sat for a while with this and realised we could get to the truth of the matter by simply looking at the proportion of deaths in the elderly over time.

We are told this pandemic has taken its toll on the elderly in particular, and so we should find a substantial and sudden increase in the proportion of elderly deaths within the population as a whole as a result. However, we also know that death certification under WHO guidelines has artificially bumped-up deaths attributed to COVID and we also know that unreliable PCR testing has artificially bumped-up deaths attributed to COVID. What we can do to circumnavigate the COVID figures fiddle is look at registered all cause deaths and this is what I have done.

In this first slide we see the weekly number of registered all cause deaths for the elderly (85+) plotted as a proportion of total weekly deaths that were registered for the population of England & Wales, this covering the period w/b 2nd January 2010 – w/b 20th March 2021. When I looked at this time series my first question was "what pandemic?"

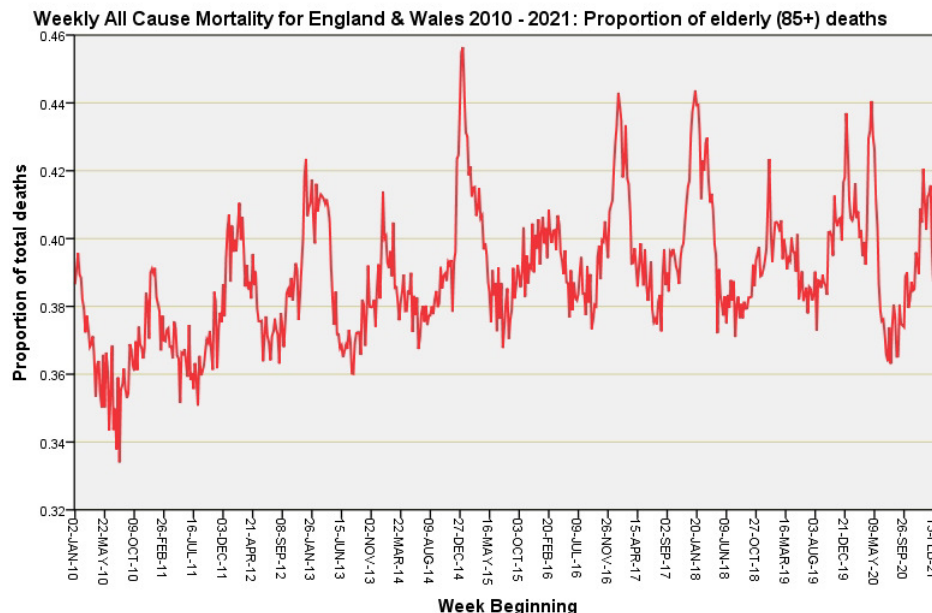
If you look closely you'll see a sharp peak around 9th May 2020 – that's it, that's the pandemic. Cover that single peak with your thumb and you'll never guess anything was going on. In fact, you'll even suggest that 2020 – 2021 has been a lean season for deaths in the elderly!

Can anyone spot the dreadful 'second wave' of great pandemic death of winter 2020/21? There is a certainly a peak nestling between w/b 26th September 2020 and w/b 13th February 2021 but compare that peak with previous winter seasons – does that look like the peak of a devastating pandemic to you? It sure doesn't to me!

How about that whopping great peak around w/b 27th December 2014? Now there's a winter season when the elderly got truly clobbered. In fact, when I sort these 586 weeks in order of proportion the current 'pandemic' doesn't get a look in until w/b 25th April 2020, which comes in at sixth place behind 10th January 2015, 3rd January 2015, 13th January 2018, 14th January 2017 and 17th January 2015.

Thus we see that, by using the proportion of deaths for the most elderly sector of the population as a measure of pandemic severity, we see nothing unusual apart from a well-defined outburst back in April/May 2020. An outburst isn't a pandemic but governments and authorities around the globe are keen to fraudulently make it into one. There was never really a first wave, let alone a second.





### ***Mortality Trends in the Elderly (85+) – ARIMA Modelling***

In my previous post entitled ‘Mortality Trends in the Elderly (85+)’ I used the proportion of registered all cause deaths in the elderly to circumnavigate the dubious COVID death count and to address claims by experts that we can ignore something they are calling “vaccine failure” because uptake in this high risk group has been disproportionately high. What experts are calling “vaccine failure” others, including myself, are calling it for what it is... DEATH. And it just may be iatrogenic death at that (i.e. death as a result of vaccination).

As time goes by and data rolls in I will be undertaking statistical modelling to unravel a whole bunch of confounding factors that are the bane of retrospective observational studies, this being my former specialism.

At this point we should note that clinical trials are designed to avoid this very mess, which is why they are so important to developing understanding. We should also note that, to date, the elderly have not been represented in any vaccination trial of significance by any manufacturer. Now that we’ve gone and vaccinated them all we’ve no control group left with which to compare benefits and dis-benefit as the jab makes its mark.

There are cunning ways around this problem, however, and this morning I’ve elected to try the first of several, this being ARIMA time series modelling of the data we saw in the previous post. Those of a nervous disposition had better look away now; this is going to get frighteningly technical even when translated into plain English!

I have established a set of indicator variables to mark out the onset of the pandemic, the April/May peak, periods of national lockdown and vaccination rollout. These, together with the weekly time series for the proportion of elderly deaths, were subject to ARIMA (Auto Regressive Integrated Moving Average) time series statistical modelling. I shall spare the gory statistical detail and reveal that three of these indicators were found to be statistically significant predictors for proportion of elderly deaths:

- COVID April/May peak Indicator
- National Lockdown Indicator
- Vaccination Rollout Indicator

According to this statistical model the proportion of deaths for the elderly rose by an estimated +0.021 during the April/May peak ( $p < 0.001$ ). The proportion also rose during the three periods of national lockdown with an immediate impact of +0.010 ( $p = 0.005$ ) and a delayed impact of +0.011 ( $p = 0.004$ ), the interesting dynamic here being a three week delay before deaths started to mount. This is an important finding because experts are going to be able to easily dismiss claims of excess death due to lockdown and seemingly provide evidence if this delay is not taken into account i.e. the elderly started to die in increasing numbers both during and after periods of lockdown, as we may intuitively expect.

The proportion also rose following vaccination rollout, with an immediate impact estimated at +0.035 ( $p < 0.001$ ), together with a delayed impact of +0.026 ( $p = 0.001$ ). A similarly interesting dynamic was found, this time being a two week delay before deaths started to mount. Again, experts will be able to easily dismiss claims of “vaccine failure” and seemingly provide evidence if this delay is not taken into account.

An important consideration here is that the vaccination rollout indicator is strongly confounded with likely seasonal effects, so we are really looking at a hybrid measure – to pin everything on the vaccine alone simply isn’t good science. Unfortunately it is going to take a year or two from now before we are able to judge whether mass vaccination of the elderly has been a good thing.

**12th April 2021**

### ***Testdemic: Appetiser***

Should it be possible to predict the number of positive cases from the number of diagnostic tests undertaken? The answer is a resounding NO! and I shall provide a short illustration...

Imagine we are at the tail end of a pandemic and only 1 in 1,000 people are infected (0.1% prevalence). If we undertake 1,000 tests at random we may expect to detect just 1 infected person, on average. Let us suppose we are now in the midst of a pandemic and as many as 1 in 10 people are infected (10% prevalence). If we now go and undertake those same 1,000 tests at random we will expect to detect 100 infected people instead of 1. It should be pretty obvious to everybody that 1 person isn’t 100 and so we see that *the number of positive cases within a population should bear absolutely no correlation to the number of tests undertaken per se* though we will, of course, get to detect more positive cases if we undertake more tests. Undertaking more tests has no bearing on disease prevalence.

Except it is indeed possible to predict the number of positive cases from the number of diagnostic tests undertaken for COVID and in the next episode I shall reveal some alarming results of statistical modelling. The conclusion that we shall graphically reach is that the pandemic is one almighty ‘testdemic’, or at least has been so in the UK since 1<sup>st</sup> June 2020. We shall also consider evidence of the game of musical chairs that is being played with reporting dates to give the impression of a genuine outbreak when none has occurred.

### ***Prediction of Cases from Test Volume***

In my post entitled ‘Testdemic: Appetiser’ I explained how it should not be possible to predict the number of positive cases within a population (prevalence) from the sheer number of tests undertaken.

This morning I decided to see whether it was possible to undertake the impossible and that is to accurately predict the rise and fall in positive cases across the UK for the period 1st June 2020 – 9th April 2021 simply by using the daily test volume figures (if anyone is still unsure of the logic please do bear in mind that test volume includes both positive and negative cases).

The UK government coronavirus dashboard usefully provides data for 6 important daily series, these being:

- PCR tests undertaken
- Antibody tests undertaken
- Pillar 1 tests undertaken
- Pillar 2 tests undertaken
- Pillar 3 tests undertaken
- Pillar 4 tests undertaken

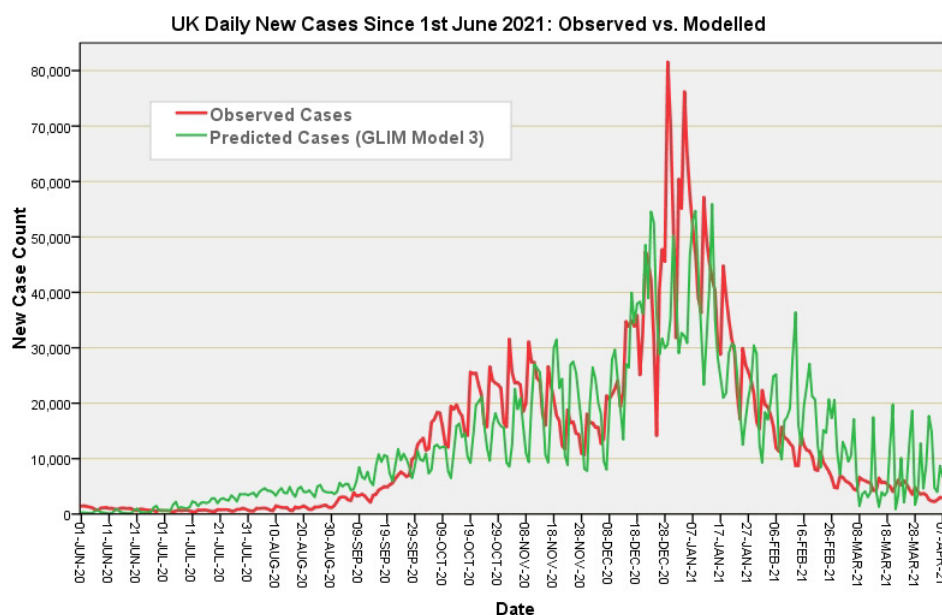
In addition to these 6 series I also derived a dummy indicator variable marking the issue of WHO guidelines on 14th December (WHO Information Notice for IVD Users) recommending test labs lower Ct thresholds to avoid excess false positives, this representing a key methodological change. Generalised Linear Modelling (GLIM) – a powerful statistical technique – was used to build a predictive model of observed positive cases using just this data and this data alone.

What I discovered is truly shocking and is perhaps best explained in a colourful slide revealing the daily number of officially declared positive cases and the predicted number of cases arising from GLIM. We now see that the autumn and winter ‘humps’ have arisen simply because test volume ramped up during these periods.

Those who like these things may wish to note the correlation between observed and predicted case counts fetched-up at a whopping  $r = 0.805$  ( $p < 0.001$ ,  $n = 312$ ), this meaning that 65% of the daily variation we see in case numbers can be explained by test volume alone. Furthermore, over the period 1<sup>st</sup> June 2020 – 9<sup>th</sup> April 2021 official sources declare a grand total of 4,113,066 positive cases whereas my model predicted

4,110,906 – a difference of just 2,160 cases representing an error of 0.05%. Such accuracy is simply not possible unless the PCR test is churning out random results, in which case any model based on test volume is going to produce decent estimates for case counts.

This, folks, is a TESTDEMIC and I have a well-fitting (Likelihood Ratio Chi-Square = 777.8 on 7 d.f.,  $p < 0.001$ ) Generalised Linear Model in my back pocket to prove it! Sometimes the elephant in the room is so big we cannot see it; more than that, some people do not wish to see it.



Source: <https://coronavirus.data.gov.uk/>

### ***Specificity & Sensitivity: Stuff You Need To Know!***

No clinical diagnostic test is 100% accurate and 100% reliable. As a result the inexperienced physician who relies solely on a single test result may well miss diagnosis of a developing disease within a patient (false negative test result) or diagnose a disease the patient doesn't have (false positive test result). On the other hand the physician might strike lucky with the test ordered and use it to correctly diagnose a developing disease within a patient (true positive test result) or correctly inform a patient that they are in the clear (true negative test result). This is why physicians consider test results in relation to many other factors before coming to a conclusion.

With the tests developed for COVID-19 we don't have the benefit of experienced physicians. Instead Joe & Josephine Public will stick a swab up their nose and post it off to a laboratory who will tell them whether they have COVID-19 or not. Just how much of a lottery this actually is will depend on two factors called test sensitivity and test specificity. Sensitivity indicates how good a test is at finding a disease, so a sensitivity of 80% means a test will correctly detect 8 infected people out of every 10 infected people, which means 2 out of every 10 people will be told they are clear when they are not (false negative). Specificity tells us how good a test is at not finding a disease, so a specificity of 90% means a test will correctly identify 9 clear cases out of every 10 uninfected people, which means 1 out of every 10 people will be told they are infected when they are not (false positive).

What complicates matters in real life is that disease prevalence (the number of infected people in the population) must also be taken into account since this will have a direct bearing on whether the test is more or less likely to produce a useful result. When a disease is rampant the big problem is failing to identify people who should have tested positive but were told they were negative because of the limitations of the test (sensitivity not good enough). However, when a disease is on the decline the big problem is telling folk they have tested positive when they are not (specificity not good enough)

According to the Centre for Evidence-Based Medicine at Oxford University the sensitivity for the RT-PCR test has been estimated at 80%, whereas the specificity has been estimated at 99.9%. Note the use of the word 'estimated'. Up to now estimates for RT-PCR test sensitivity and specificity have come from studies of previous influenza-like outbreaks, theoretical modelling and limited laboratory assay. The trouble with all this is that the gold standard of using a purified viral isolate as reference genomic material in known quantities has been circumvented.

Let us set this thorny issue aside and, instead, focus on what the RT-PCR test is apparently capable of in terms of declared diagnostic performance. What I've done for this analysis is calculate the percentage of people who are going to be told they have COVID-19 when they haven't (false positive) for a fixed test sensitivity of 80% and for a disease prevalence ranging from 0% - 10%. On this chart I have drawn the

curve for the claimed specificity of 99.9% (red) along with a curve for a specificity of 95.0% that is more likely to represent real life instead of manufacturer's hubris (orange). I shall now walk you through this...

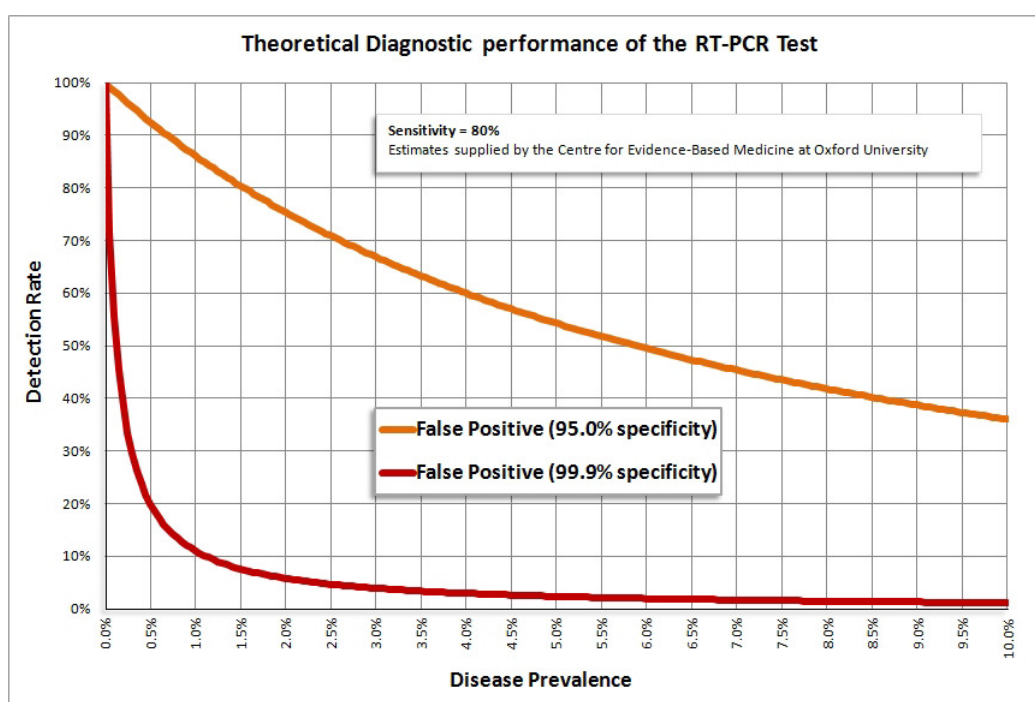
With a disease prevalence up at 10.0% (1 in 10 of the population are infected) we see that false positives are pretty much negligible for the claimed specificity of 99.9% at 1.1% of reported cases, but down in the likely real world of 95.0% specificity we see that as many as 36.0% of cases will be told they are positive when they are not.

Let us now drop down to the other end of the scale with a pandemic in decline at 1.0% prevalence (1 in 100 of the population infected). The false positive reporting rate for the manufacturer's claimed specificity of 99.9% now rises to a not insubstantial 11.0% whereas the likely real world specificity of 95.0% yields an astonishing 86.1% of false positive cases.

We can now see that as a pandemic wanes we'll always end up scaring the shit out of folk and locking them down simply because of the constraints imposed by test performance and having Joe & Josephine Public self-diagnose by sticking their nasal swab into a diagnostic tombola.

Even with an all singing, all dancing specificity of 99.9% we'll hit a 55.5% false positive reporting rate when prevalence cools to 0.1% (1 in 1,000 of the population infected).

Curiously, I have yet to find robust studies of test sensitivity and specificity that stand up to scrutiny, which is odd because you'd think this was an absolute priority with some 135,152,009 tests undertaken in the UK to date and no clue as to how reliable the results are!



16<sup>th</sup> April 2021

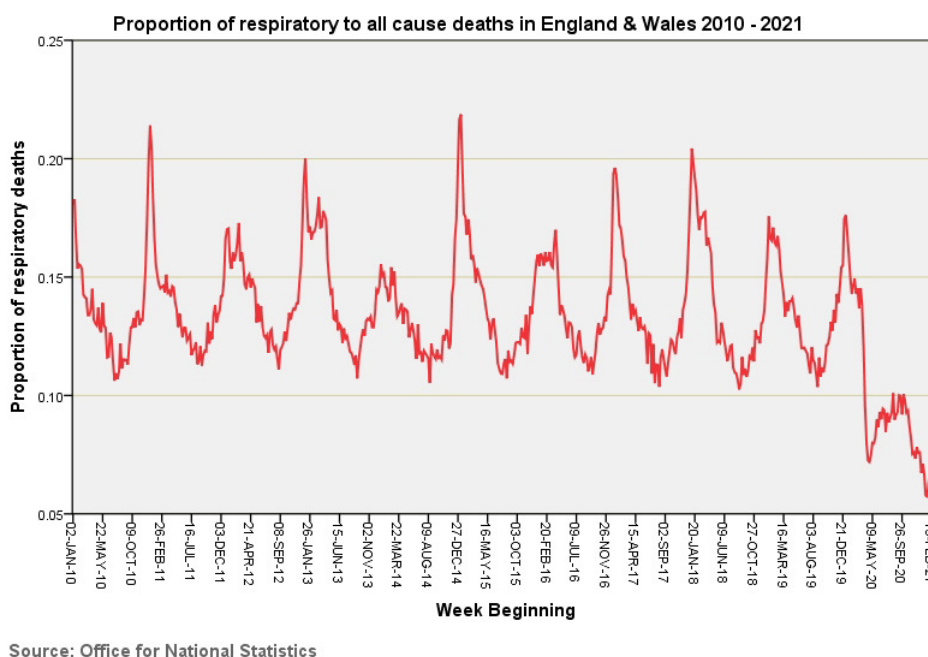
### ***Proportion of respiratory to all cause deaths***

Whilst updating my database with the latest figures from the Office for National Statistics I thought I'd just pop this rather revealing slide out of the proportion of respiratory to all cause deaths for the period w/b 2<sup>nd</sup> January 2010 – 27<sup>th</sup> March 2021 for England and Wales. In using proportions like this we iron out wrinkles due to population variability and other factors. It should be pretty obvious that the proportion of respiratory death has remained fairly constant over the last decade, with a strong seasonal showing as we may expect.

The authorities are expecting us to believe that non-COVID respiratory diseases have done something magical since the start of the pandemic and somehow evaporated into thin air, presumably because of all that helpful mask wearing and logical lockdown policy. No doubt the vaccine is magical also. I use the word 'magical' because somehow all non-seasonal respiratory disease has been cured at the same time including chronic conditions such as COPD, emphysema and asthma, being diseases that all respond so very well to mask wearing. Yes, I'm being

sarcastic. That same magic also covers cases of streptococcal, pseudomonal, staphylococcal, klebsiellal, Escherichial and mycoplasmic pneumonia as well as pneumoconiosis and fibrosis.

Either we are facing an incredible medical miracle, as the talking heads claim, or some suit somewhere is fiddling with clinical coding. I think you can guess where I'm putting my money...



17<sup>th</sup> April 2021

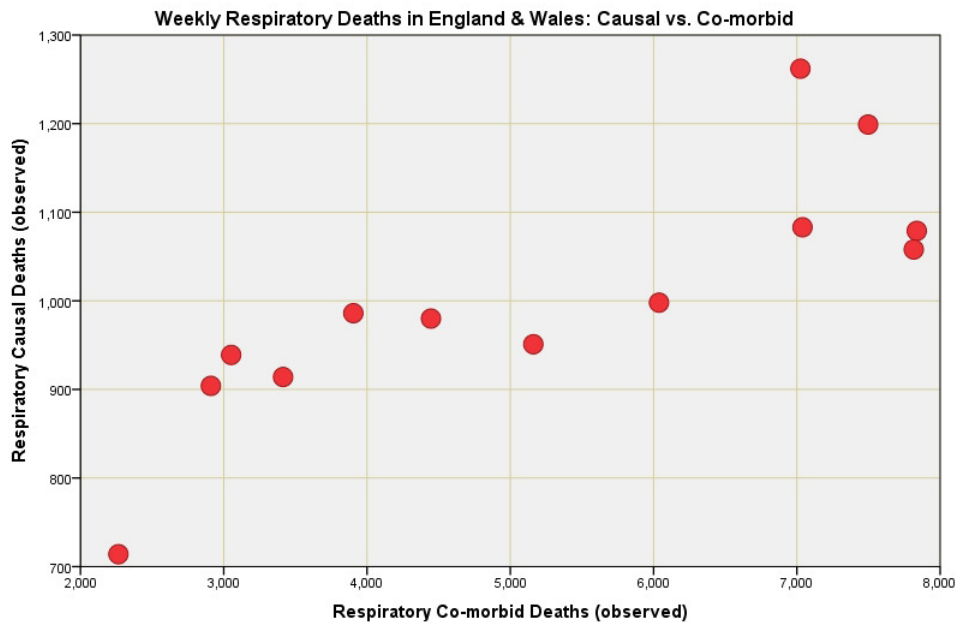
## ***Suspicious Data***

This morning I fancied having a go at estimating how many respiratory deaths have been coded as COVID-19. To do this I first need to remove weekly COVID-19 causal deaths from all cause deaths but realised ONS and other UK authorities have been reporting COVID-19 as a co-morbidity as well as a cause. We've come across this hiccup before in discussion on death certification. The death certificate allows for the recording of primary cause under section I and the recording of any co-morbidity under section II (e.g. heart attack for section I and high blood pressure for section II), and we discovered that published COVID-19 figures are for mention on sections I and II, whereas comparative respiratory death counts published by ONS are for section I only. I'd call this blatant fraud but let's move on...

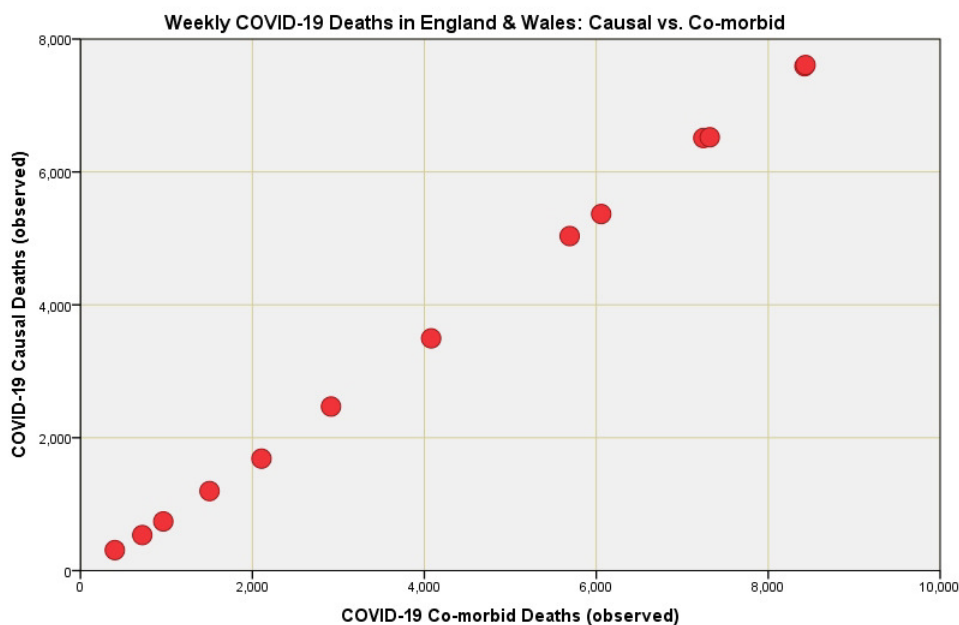
Since w/b 2<sup>nd</sup> January 2021 the ONS have usefully added a new table to their weekly spreadsheet that separates causal from co-morbid death for COVID-19, influenza/pneumonia and respiratory disease. This is a real bonus for crunchers like me but this morning I discovered something very odd indeed. I shall start by revealing a scatterplot for weekly respiratory death for England & Wales starting w/b 2<sup>nd</sup> January, whereby we see causal deaths (section I certification) plotted against co-morbid deaths (section I or II certification). This is the snaky sort of scattered squiggle we might expect to see, there being no clear relationship other than a general positive connection (slide #1).

Let us now consider the same plot but for COVID-19 data (slide #2). This is so bizarrely linear I had to triple-check I had not made a mistake in transcribing the ONS data. Nope, no mistakes made at all – we are looking at a surgically precise relationship between COVID-19 as mentioned on section I of the death certificate as opposed to COVID-19 mentioned on both sections I and II of the death certificate. The real world does not act like this, the real world acts like respiratory disease in the first slide.

The conclusion I must draw is that the death data for COVID-19 are highly contrived – an output of an algorithm as it were. The match is so precise that Pearson correlation coefficient is coming out as  $r=0.99982$ , which is bonkers. More than bonkers; I think the word is 'corrupt'.



Source: Office for National Statistics. Data period w/b 21/1/21 - 27/3/21



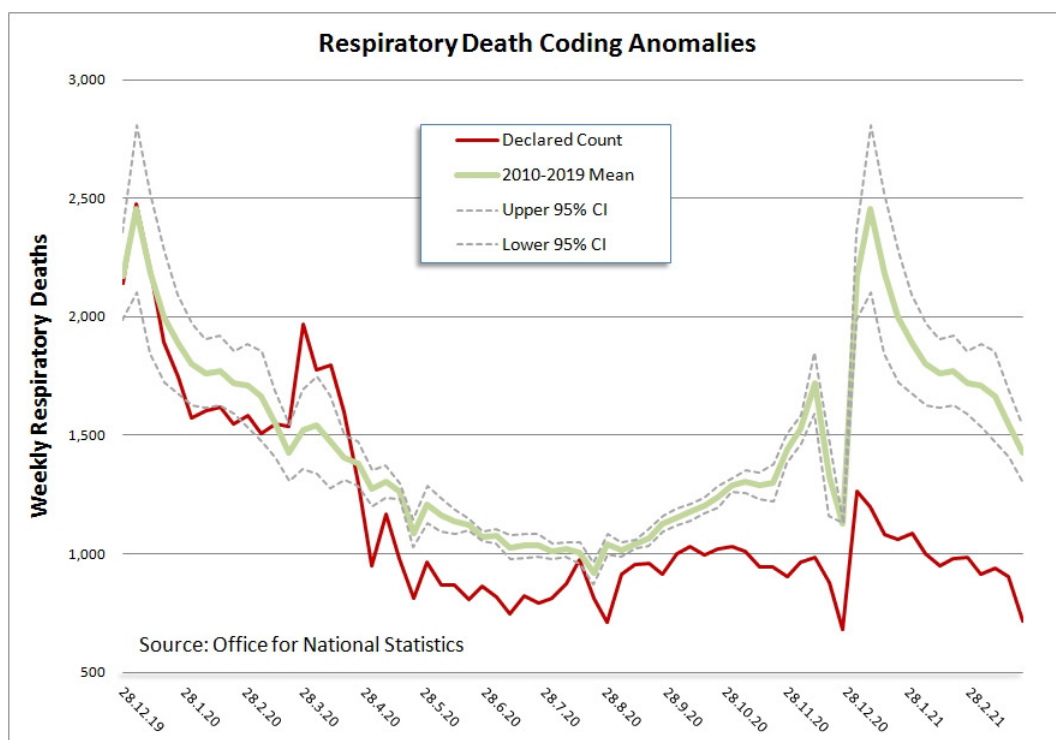
Source: Office for National Statistics. Data period w/b 21/1/21 - 27/3/21

## Missing Respiratory Data

In my previous post entitled '*Suspicious Data*' we discovered something adrift with the way COVID-19 causal and co-morbid deaths have been coded within the UK, with a mighty strong suggestion of use of algorithms to massage a desired result rather than rely on certification as made by qualified medics – a subject that was covered in '*Death Certification Fiasco*' (18th March 2021) and '*Coding Death*' (19th March 2021). In my eagerness to pursue an estimate of how many respiratory deaths have been miscoded as COVID-19 deaths by the management suits and their algorithms I decided to pull down weekly mortality figures for respiratory death for the period 2010 – 2019 and calculate the decadal means and confidence intervals for equivalent weeks of the year to get a feel for how things generally pan out. The curves for these may be found in the attached slide, along with a rather ugly story told by the declared count.

We now see the declared count for respiratory death skulking along the bottom from April 2020 onward, with an inexplicable further divergence from August 2020 onward. Somebody is making a decided effort to pile respiratory death into the COVID-19 bucket and they are doing it with increasing levels of deceit; presumably in order to bump the COVID stats up for winter 2020/21. In the next episode I shall claw back these miscoded deaths, properly attribute them to respiratory disease and then proceed to reveal what COVID did or did not do.





18<sup>th</sup> April 2021

## More Suspicious Data

In my previous post entitled 'Suspicious Data' we discovered a bizarre situation in which COVID causal deaths were a surgically precise function of all COVID deaths, whether causal or co-morbid. I stated that this situation was highly artificial and must have come about by application of a strict algorithm to death certificate records.

Though this may sound far-fetched this is precisely what the UK data authorities do under the umbrella of Automated Cause Coding, the latest software being called MUSE (Multicausal and Unicausal Selection Engine) that was updated on 1st January 2020 just in time for the pandemic (link below).

I had anticipated that engineering of the data to suit a political agenda stopped with this, but I was wrong. I now attach a similar scatterplot revealing the relationship between observed COVID-19 total deaths (section I or II of the death certificate) and registered all cause weekly deaths for England & Wales.

We now see that perfectly surgical linear relationship emerge once more for weeks 4 to 12 of 2021. There is no way we'd be seeing a relationship this precise over a span of nine weeks if it were arising naturally from a disease outbreak within the population.

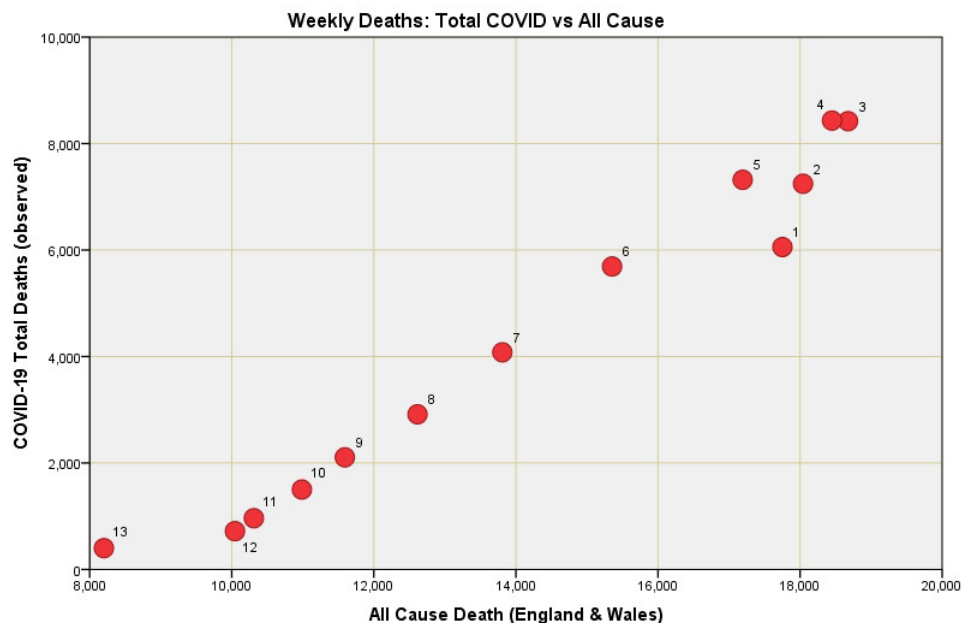
It's quite clear that for these nine weeks the total number of COVID-19 deaths has been contrived in some way and I would suggest the MUSE system is generating COVID-19 as a cause of death when the condition wasn't even entered onto the death certificate. An example would be re-coding J11.0 (Influenza due to unidentified influenza virus with pneumonia) as U07.2 (COVID-19, virus not identified). Only those understanding the inner workings of MUSE would realise what is going on.

Back in a post entitled 'Goal Posts Shifting Again' on 16th March 2021 I warned folk of forthcoming fiddling after discovering this paragraph embedded within an ONS spreadsheet...

From week ending 26th February 2021 (week 8) new ICD-10 codes for COVID-19 issued by the World Health Organisation (WHO) have been implemented for deaths involving COVID-19. The new codes are U09.9 (Post-COVID condition, where the acute COVID had ended before the condition immediately causing death occurred) and U10.9 (Multisystem inflammatory syndrome associated with COVID-19 (also called Kawasaki-like syndrome), a specific, uncommon effect of COVID-19 in children). These are in addition to the existing codes of U07.1 (COVID-19, virus identified) and U07.2 (COVID-19, virus not identified, i.e. COVID-19 stated to be unconfirmed or suspected).

...this will give the data authorities remarkable leeway in which they can adjust the information further and a dark closet in which they can hide any extreme reactions to the vaccine.

[https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/methodologies/userguidetomortalitystatisticsjuly2017?fbclid=IwAR1BYeNm2ylqHlpcfdaQ0VtpodYWe0arOjXzWcJV\\_nOIzizLWj3GOEraSJM#cause-of-death-coding](https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/methodologies/userguidetomortalitystatisticsjuly2017?fbclid=IwAR1BYeNm2ylqHlpcfdaQ0VtpodYWe0arOjXzWcJV_nOIzizLWj3GOEraSJM#cause-of-death-coding)



Source: Office for National Statistics. Data period w/b 2/1/21 - 27/3/21

19<sup>th</sup> April 2021

### Why Suspicious?

A rather decent discussion has developed down in my post entitled *'More Suspicious Data'* and so I've brought it up here in case others find it illuminating. In this post I'll try and explain why I'm finding the COVID death data suspicious and the answer, in a nutshell, is lack of the natural variability we would expect from an organic process arising within a real population over time. To illustrate this I'm going to resort to simulation and use rounded figures so we can understand the situation more clearly.

In the attached slide we see simulated weekly death counts for a run of 13 weeks. All cause deaths start at 20,000 and drop 1,000 each week down to 8,000 deaths. In column 'T' I have fixed the percentage of COVID deaths at 50% for every single week, and in column 'U' we see the result which now drops rigidly down from 10,000 to 4,000.

In column 'V' I've taken this fixed percentage of 50% and added a bit of variability, this being a normally-distributed error with a mean of zero and standard deviation of 5%. We now see the percentage of COVID deaths start at 47% and end at 45%, the overall mean rate over all 13 weeks being exactly 50%. This is the sort of natural variability we would expect to see week-on-week if we went and counted something in the real world. These naturally varying percentages give rise to the variable COVID counts in column 'W'.

When both rigidly fixed and variable COVID counts are plotted against all cause death counts we get the scatterplot shown. The rigidly linear hierarchy of the fixed weekly rate (red blobs) sits in stark contrast to the scatter produced by introducing some natural variability (green crosses). In a real world situation that scatter of green is what we get when we count real deaths in real people – some diseases splatter more and some splatter less, but they all splatter to some degree. If you now look back at posts *'Suspicious Data'* and *'More Suspicious Data'* you'll see those rigid hierarchies sticking out for COVID deaths like a sore thumb. Real death data doesn't do this and I've looked at an awful lot of it these past 37 years!

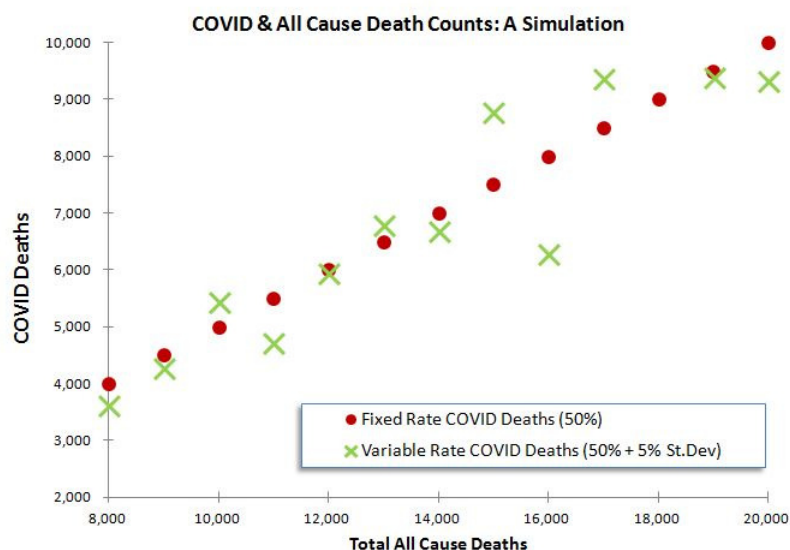
One final thing I can do here is to set my experience aside and use statistical techniques to determine if something truly odd is going on. We do this by establishing a simple linear model that predicts COVID deaths from all cause death data and then running tests to see if the observed COVID counts significantly differ from the theoretically derived counts. If they don't then we will have established that the observed counts are following a theoretical distribution and not one imbued with natural variability sufficient to nudge counts from a theorised value. To kick this off I selected weeks 4 – 12 of 2021 (see *'More Suspicious Data'*) and ran Generalised Linear Modelling (Tweedie mixed model with identity link

and hybrid estimation using maximum likelihood estimation) for the prediction of COVID causal death counts from all cause death counts. The resulting predicted counts, together with observed counts, were then subject to four different non-parametric tests for related samples and further Generalised Linear Modelling using data source (observed, predicted) as a binary factor. The bottom-line results are as follows:

- Related-samples sign test –  $p=1.000$
- Related samples Wilcoxon signed rank test –  $p=0.594$
- Related samples Friedman's two-way analysis of variance by ranks –  $p=0.739$
- Related samples Kendall's coefficient of concordance –  $p=0.739$
- GLIM (Tweedie, identity, hybrid MLE) –  $p=0.986$

In plain English what this boils down to is that, for weeks 4 – 12 of 2021, the weekly COVID causal death counts as published by ONS are most certainly following a theoretical distribution devoid of the natural variability we may expect to see. In sum, the data for this period were algorithmically derived.

| R           | S                      | T                | U                             | V                                     | W                                            |
|-------------|------------------------|------------------|-------------------------------|---------------------------------------|----------------------------------------------|
| Week Number | Total All Cause Deaths | Fixed Percentage | Fixed Rate COVID Deaths (50%) | Variable Percentage (50% + 5% St.Dev) | Variable Rate COVID Deaths (50% + 5% St.Dev) |
| 1           | 20,000                 | 50%              | 10,000                        | 47%                                   | 9,336                                        |
| 2           | 19,000                 | 50%              | 9,500                         | 49%                                   | 9,395                                        |
| 3           | 18,000                 | 50%              | 9,000                         | 56%                                   | 10,024                                       |
| 4           | 17,000                 | 50%              | 8,500                         | 55%                                   | 9,381                                        |
| 5           | 16,000                 | 50%              | 8,000                         | 39%                                   | 6,299                                        |
| 6           | 15,000                 | 50%              | 7,500                         | 59%                                   | 8,782                                        |
| 7           | 14,000                 | 50%              | 7,000                         | 48%                                   | 6,690                                        |
| 8           | 13,000                 | 50%              | 6,500                         | 52%                                   | 6,801                                        |
| 9           | 12,000                 | 50%              | 6,000                         | 50%                                   | 5,951                                        |
| 10          | 11,000                 | 50%              | 5,500                         | 43%                                   | 4,728                                        |
| 11          | 10,000                 | 50%              | 5,000                         | 54%                                   | 5,435                                        |
| 12          | 9,000                  | 50%              | 4,500                         | 48%                                   | 4,286                                        |
| 13          | 8,000                  | 50%              | 4,000                         | 45%                                   | 3,639                                        |
|             |                        |                  | mean                          | 50%                                   |                                              |



24<sup>th</sup> April 2021

## Predicting UK Certified Deaths

It should not be possible to predict the number of deaths due to COVID-19 from the number of RT-PCR tests undertaken. Testing the population is one thing but having some of them die is another matter, right? Wrong. It is entirely possible to predict the number of certified deaths due to COVID-19 from the number of RT-PCR tests alone and I am going to provide statistical proof.

Firstly, what I mean by the phrase 'death due to COVID-19' are those deaths where COVID-19 has been entered on section I of the death certificate as the underlying cause by a qualified physician. We expect this to be a robust medical decision based upon what actually happens to patients in their care, and we should note that physicians may enter COVID-19 as a section I cause of death even if a positive test result was not obtained. These causal deaths should bear no intrinsic relationship with the volume of testing the NHS cares to rollout across the nation each day; testing is testing and death is death.

Except if we look at the period 1st September 2020 – 26th March 2021 we find daily certified death and daily volume of PCR testing yielding a Pearson bivariate correlation of  $r=0.576$  ( $p<0.001$ ,  $n=207$ ). This tells us there is a statistically significant positive correlation between the two when, theoretically, shouldn't be anything of the sort.

Let us now take a look at the raw data giving rise to this correlation coefficient. In this first slide I've superimposed the data series for daily UK deaths due to COVID-19 over the daily number of RT-PCR tests undertaken. We now see that, despite significant variation, the two generally seem to rise and fall together - more and more tests were undertaken in the run up to the January peak and more and more deaths were counted over the same period.

The big head scratcher here is whether this just happens to be a coincidence driven by seasonal effects or whether there is some genuine but obscure connection.

To unravel this we can turn to Temporal Causal Modelling (TCM), which is a technique based on a concept called Granger causality. Interested folk may wish to Google this but for now all I'll say is that TCM enables statisticians to separate inadvertent correlations arising over time from something that might just be genuine.

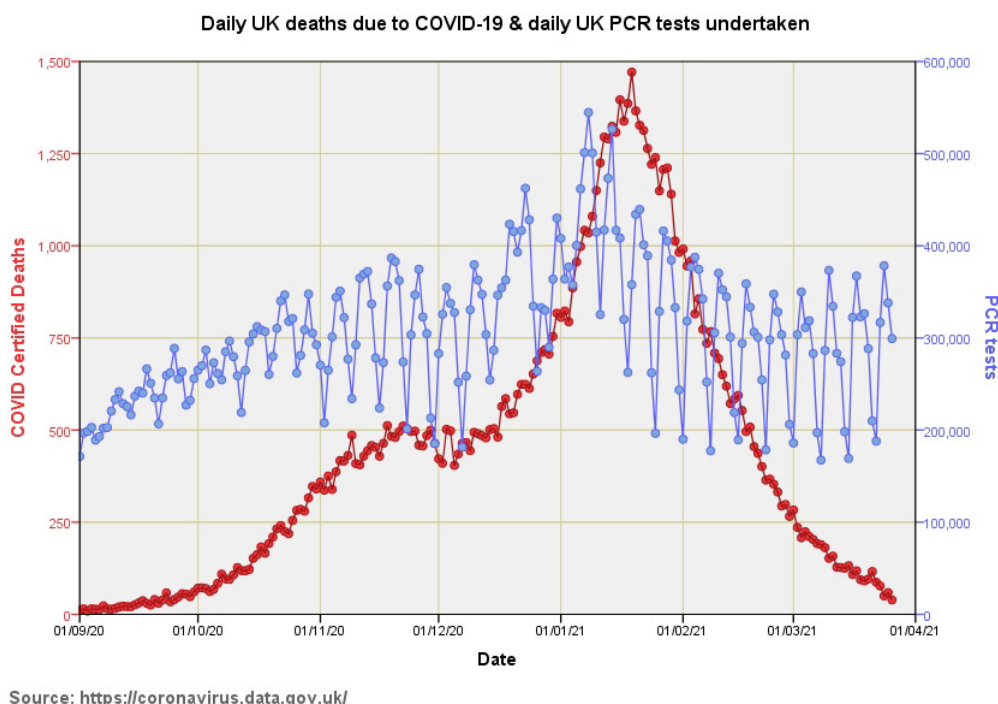
When I run TCM for the period 1st September 2020 – 26th March 2021 I find that the number of daily RT-PCR fetches-up as a statistically significant predictor of daily certified COVID-10 death ( $p=0.003$ ). In plain English, there is a connection between testing and cause of death certification when there shouldn't be.

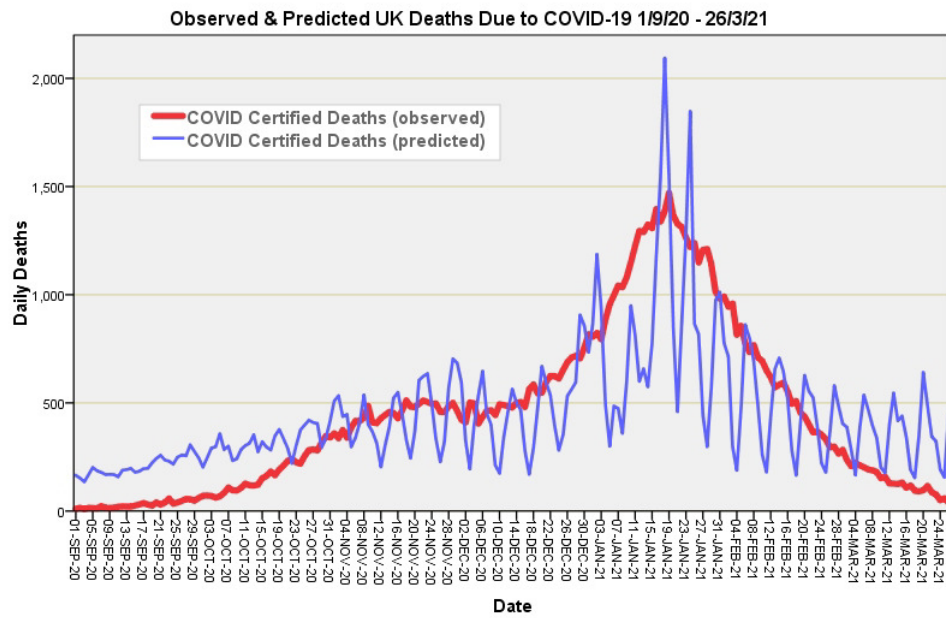
To show just how powerful this connection is I decided to take the number of daily RT-PCR tests alone and subject them to Generalised Linear Modelling (GLIM) to develop a simple statistical model for the prediction of certified death counts from the number of tests. In doing so the only adjustment I had to make was to account for an observed 10-day administrative delay between testing and death. The results of this modelling exercise are presented in the second slide.

You are looking at the impossible; there is no way I should be able to get anywhere near predicting the number of causal deaths from the volume of tests undertaken up and down the country, yet here we are looking at a relationship whose correlation coefficient is  $r=0.702$  ( $p<0.001$ ,  $n=207$ ).

The conclusion I must draw at this stage is that either physicians in the UK are relying on the RT-PCR test to tell them how their patient died or the automated causal coding algorithm of the Office for National Statistics (ONS) known as MUSE (Multicausal and Unicausal Selection Engine) is over-riding what is being declared on death certificates.

It sure comes to something when you can't trust something as dependable as death!





Source: <https://coronavirus.data.gov.uk/>

# John Dee, His Almanac

5<sup>th</sup> May 2021

## *EudraVigilance Latest*

As at 1st May April 2021 the EudraVigilance European database for suspected adverse drug reaction reports indicated 9,627 deaths amongst 384,178 individuals for whom adverse reaction reports for the four COVID-19 biological products under trial have been filed, this representing a report fatal outcome rate of 2.5%. Over the same time frame a total of 3,120 adverse individual reactions to standard 'flu shots were reported across Europe of which just 13 were fatal, this giving us report fatal outcome of 0.42%. The difference between these two rates is very highly statistically significant ( $p < 0.001$ ), with the likelihood of a fatal outcome report following use of COVID-19 biological products being 6.0 times higher than that for 'flu shots.

The 384,178 individuals reporting adverse effects following vaccination with COVID-19 biological products generated 483,501 non-serious and 513,688 serious reactions, making a total of 997,189 registered adverse reactions between them, this equating to a mean reporting rate of 2.6 adverse reactions per individual.

In terms of ranked adverse incident rate (percentage of individuals reporting out of those treated) by product we find the following: AstraZeneca (0.75%), Pfizer (0.22%), Moderna (0.21%), Janssen (0.13%). In terms of eliciting reports following dosing the AstraZeneca product clearly stands out from the rest, being 5.6 times more likely to elicit an adverse report than the Janssen product ( $p < 0.001$ , Poisson Means Test). Overall, the adverse reporting rate for all four licensed products is 0.350% i.e. 1 in every 286 treated people will develop symptoms sufficient to trigger an adverse incident report.

In terms of ranked fatal outcome rate (percentage of fatal outcomes reported for those treated) by product we find the following: Moderna (0.027%), Janssen (0.012%), Pfizer (0.007%), AstraZeneca (0.007%). In terms of associated fatal outcomes following dosing the Moderna product clearly stands out from the rest, being 3.8 times more likely to be associated with a fatal outcome report than the AstraZeneca product ( $p < 0.001$ , Poisson Means Test). Overall, the fatal outcome by dose rate for all four licensed products is 0.009% i.e. 1 in every 11,111 treated people will return a fatal outcome following vaccination.

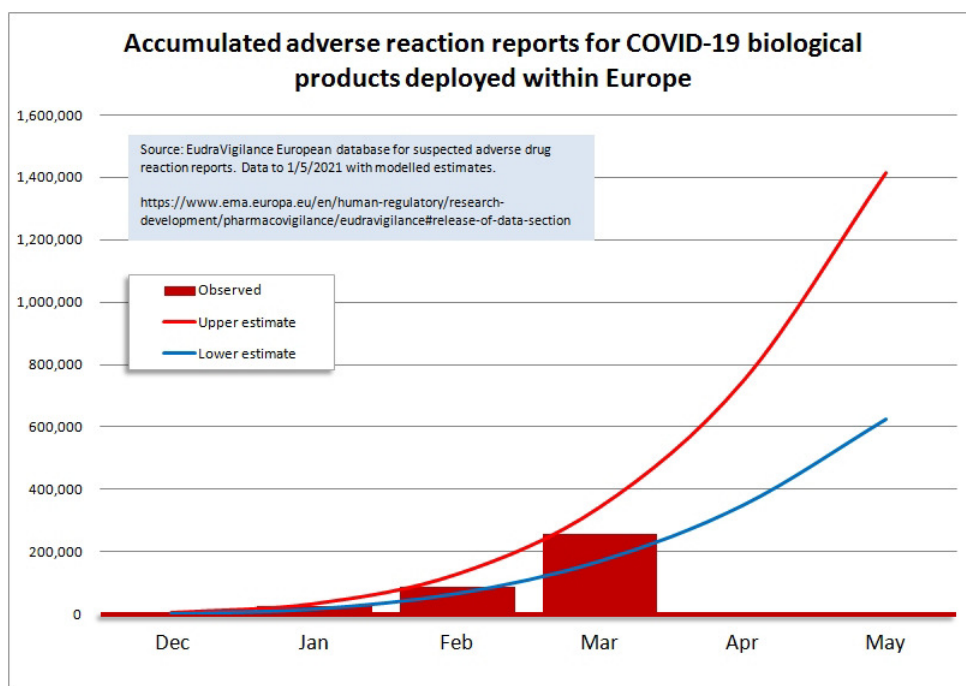
In terms of ranked ratio of serious to non-serious adverse reaction for the four products under licence we find the following: Janssen (1.68), AstraZeneca (1.46), Moderna (1.26), Pfizer (0.65). Only Pfizer's product is generating more non-serious adverse reactions than serious. In terms of ranked report fatality rate (percentage of fatal outcome reports to total reports) by product we find the following: Moderna (12.9%), Janssen (9.2%), Pfizer (3.1%), AstraZeneca (0.9%). It is somewhat puzzling that the Moderna product is yielding 14.1 times the fatal report likelihood than the AstraZeneca product.

According to OECD data 'flu vaccination rates for the primary target population of 65+ years has been running at 40% uptake across Europe, on average, for the last three years. In comparison, the European Centre for Disease Prevention and Control (ECDC) report a mean uptake of 64% for COVID-19 biological products for the age group 60+ years. We may thus expect adverse incident reports for COVID-19 biological products to be running at around 1.6 times that for standard 'flu shots. Incredibly, we find 123 times more adverse reports following vaccination with COVID-19 biological products and 741 times more reports of fatalities. Whilst this is astonishing and alarming in equal measure the problem doesn't end here.

Statistical modelling of accumulated adverse reports for the months of December 2020 through to March 2021 reveals the number of affected individuals is growing as a power series of the order 3.3 ( $R\text{-square} = 0.999$ ,  $p < 0.001$ ). If this trend continues then we may expect just over 1.5 million adversely affected individuals across Europe come June and as many as 12.5 million affected individuals come December. If this modelled scenario holds true in months to come it is highly likely that many, if not all European healthcare systems will collapse under the weight of sheer numbers.

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>





6<sup>th</sup> May 2021

## Risk Comparison

In my last post I churned out a whole bunch of figures derived from the EudraVigilance European database for suspected adverse drug reaction reports combined with dose data provided by the European Centre for Disease Prevention and Control. In this post I am going to turn these into one easy-to-understand slide.

Before this we need to have a word about prevalence, which is the term used to denote the proportion of the population that are carrying the virus. This is not easy to determine because our blood and our bodies carry our viral history. Anybody going for a RT-PCR test this morning might test positive not because they are carrying the live virus but because they are carrying evidence of a historic infection. Seroprevalence studies (studies that look for antibodies in blood samples) are very much historical studies since it takes weeks to build sufficient antibodies, which we then may carry for a lifetime.

Thus, when we hear experts claiming 1 in 3 households in Britain are infected with COVID (e.g. REACT trial results) that doesn't mean to say that is the situation on the ground at this moment in time. All it means is that at least one person in a household was, at some point since January 2020, carrying the virus in sufficient quantities to produce antibodies that we have now detected a while later. The public, being sensible, automatically assume that experts talk about the disease as it exists within the population this very morning (a.k.a point prevalence) but that is never the case!

Ward et al (SARS-CoV-2 antibody prevalence in England following the first peak of the pandemic. Nature Communications 12, Article number 905. 2021) did as good a job as any in trying to determine what is called the point prevalence and estimated it to be 6% during the peak of the UK pandemic. Thus, at any one time no more than 6 in every 100 people were actually carrying any virus. Over time this point prevalence builds into the historic prevalence that gives us that 1 in 3 estimate as the virus spreads.

This is an important concept to grasp because if you want to assess your individual risk you have to know the point prevalence for the environment in which you work, rest and play.

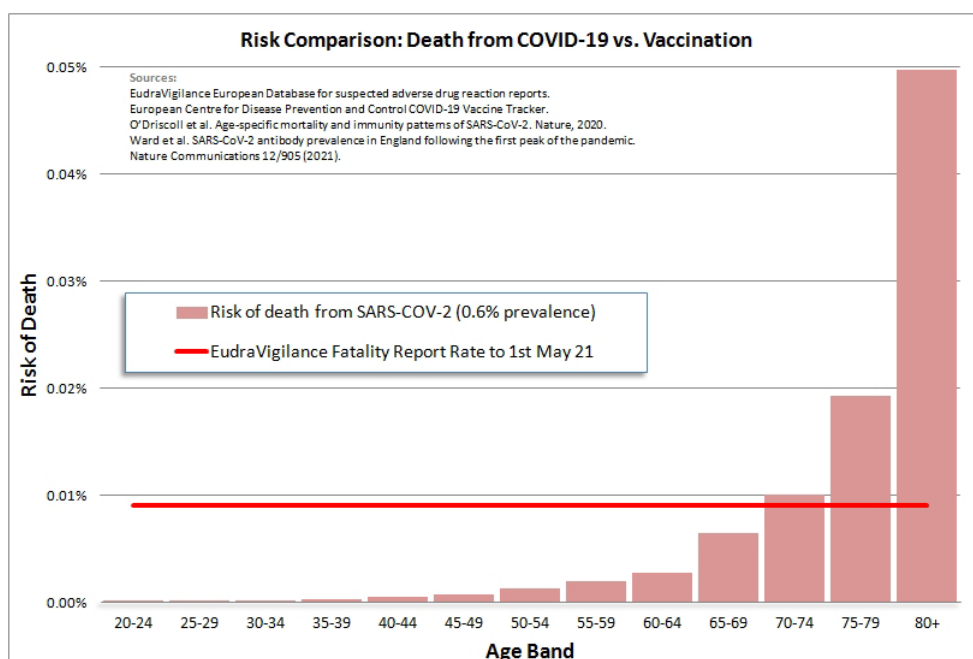
During the initial UK peak of 2020 this was estimated at 6% but it is now going to be much, much less. Let us suppose it has sunk from 6% to 0.6%, what then? Well, I can now pull down estimates of the infection fatality rate from O'Driscoll et al (Age-specific mortality and immunity patterns of SARS-CoV-2." Nature. DOI: 10.1038/s41586-020-2918-0 (2020)) and factor these by the estimated point prevalence of 0.6% to obtain the estimated the risk of death from COVID, then compare this with risk of death following vaccination in that single slide.

We now see that, for a point prevalence of 0.6%, outcomes following vaccination with COVID-19 biological products are less favourable than outcomes for viral infection for anybody under 70 years of age.

In plain English, the vaccine is more likely to kill you if you are under 70! The only clear benefit would seem to lie with those aged 75 and older. However, it is somewhat sobering to realise that, with a point prevalence of 0.06% (6 in 10,000 infected), then the risk of death from the vaccine far outweighs the risk from the virus for all age groups.

A major assumption underpinning this analysis here is that (voluntary) adverse incident reporting across Europe offers 100% data capture but we know it does not. In the States an audit of the (voluntary) VAERS system revealed only 1% of reactions get registered and I've heard rumours of it being no greater than 10% for EudraVigilance. Multiply that 0.009% red line by 10 to get 0.09% and we now see risk of death following vaccination outstripping the risk from the virus by a long way.

Medical authorities wave all this away suggesting there is no causal link. In the final analysis there may not be but we simply don't know that for certain as yet. People are gambling with their lives in a situation of nil knowledge and unprecedented expertism.

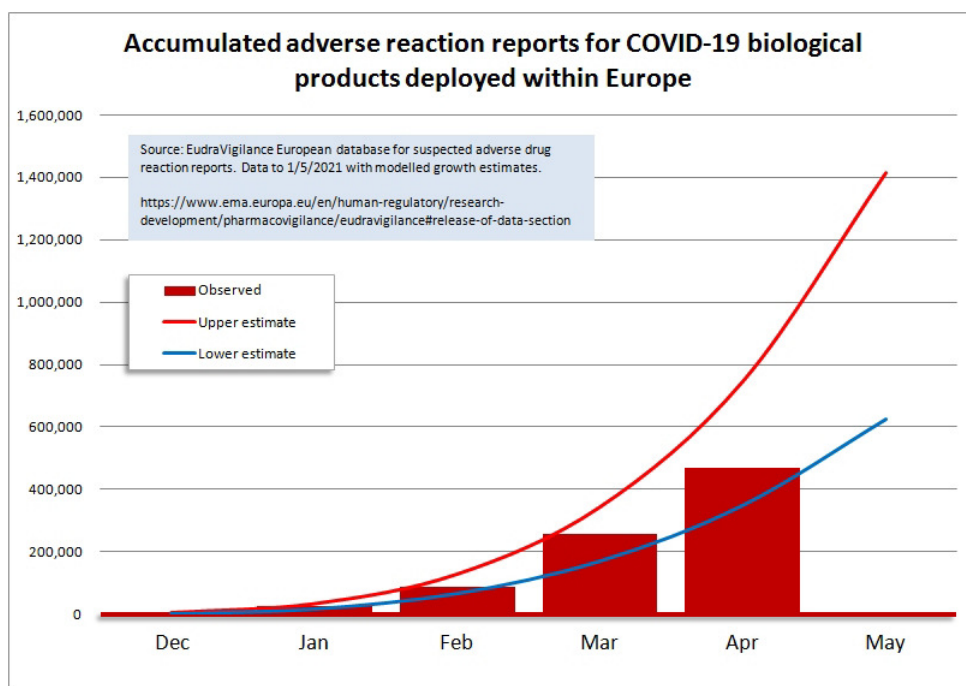


**7<sup>th</sup> May 2021**

## April Data

In my post *EudraVigilance Latest*, dated 5th May 2021 I put out a chart with figures for accumulated adverse reaction reports for December 2020 through to March 2021. I had hoped EudraVigilance bods would have released the all important April data but we're now a week into May with still nothing showing. Since I've been taking snapshots of the data I realised I could derive these myself by taking declared March figures away from the new totals – simples!

Here is the updated chart showing the April data, which is pretty much sitting slap bang in the middle of my growth prediction using the December – March figures. Consequently, I ran statistical modelling again and this confirmed the growth in numbers is following a power series of the order 3.3 (R-square = 0.999, p<0.001). If this trend continues our health services will need to brace themselves for handling 12.5 million adverse reactions across Europe come next December.



8<sup>th</sup> May 2021

### ***Mortal Odds***

The ‘flu jab has been around for decades and has a well-established risk profile. According to the OECD around 40% of Europeans aged 65 and over are jabbed each year. This is a lot of people, yet the EudraVigilance European database for suspected adverse drug reactions, as at 1<sup>st</sup> May 2021, only records 13 deaths for the previous 12-month period across all brands in current use.

According to the ECDC the COVID jab has so far managed to reach 64% of the European population aged 60 and over so, all things being equal, we would expect to see 20.8 deaths for a product of comparable safety. Instead, we observe a total of 9,627 deaths – an astonishing fact that seems to be going over everyone’s head including those who are supposed to be safeguarding our health.

I’ve had people say to me “yes, but they’ve injected millions” as if to say those 9,627 deaths don’t really matter and represent a minute fraction. Except they do matter – each and every one - and they don’t represent a minute fraction. We know this because data held by ECDC enables us to calculate the number of Europeans who have received at least one COVID shot and this turns out to be 110,056,321 individuals for the four main products under licence.

A total of 9,627 deaths amongst 110,056,321 individuals yields an overall mortality rate of 0.009%, which may not seem a lot to many until we quote it as betting odds, these being 11,111 to 1. In plain English, around 1 in 11,000 people are dying after their COVID jab. This doesn’t feel like a minute fraction to me, nor does it feel anywhere as safe as we might expect. All things being equal it is 463 times less safe than the well-established ‘flu jab, yet is somehow claimed to be a ‘safe’ product.

We may also now see how a somewhat prejudicial “yes, but...” response may arise for anybody whose circle of friends and family amounts to 11,111 contacts is expected to come into contact with just one death, in which case the issue can easily be dismissed. At the national level these odds are a different matter entirely.

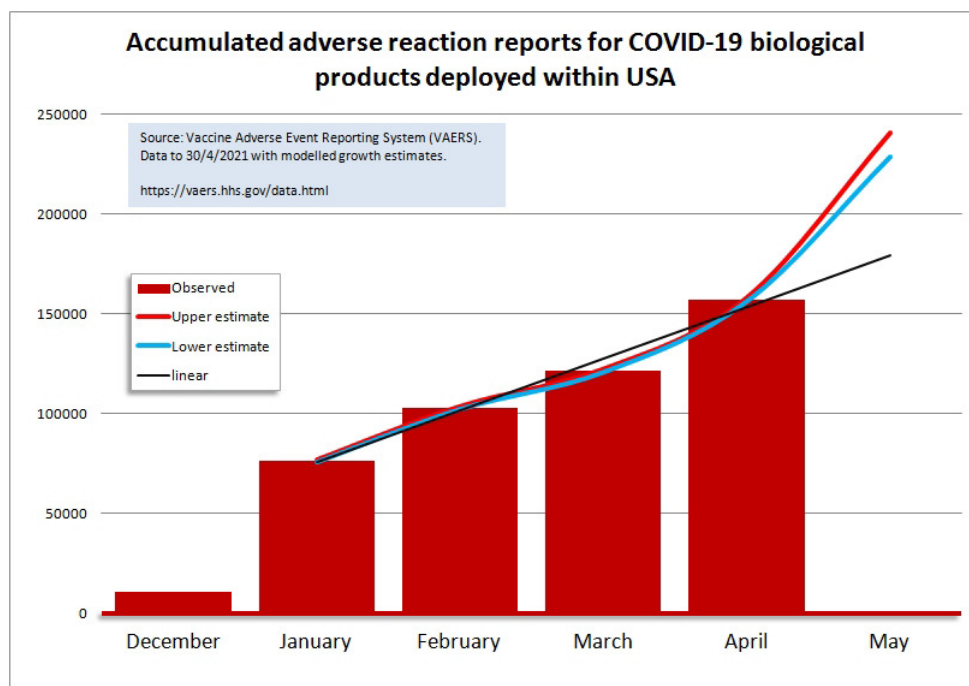
10<sup>th</sup> May 2021

### ***VAERS III: Growth Curve***

I attach a slide of monthly accumulated adverse reaction reports for COVID-19 biological products in use across all US territories as retrieved from VAERS for the period 15<sup>th</sup> December 2020 – 30<sup>th</sup> April 2021. People understandably want to know where we could be going with this so I opted to model counts two different ways – simple and fancy. December is only a part month so we need to ignore this and look at January – April. Four data points is not a lot to analyse, so everything I’m about to reveal needs to be taken with huge pinch of salt.

If we assume things are progressing in a linear manner then that black line points the way for May, with an estimated 178,908 events. At this steady rate of progression we may expect to see between 319,570 and 399,515 events come next December

What may look like a steady linear progression from January – April actually hides an extraordinary secret in that a cubic model is absolute perfect fit to the data (R-square = 1.000,  $p < 0.001$ ). I've never had a perfect fit like this in 37 years of crunching so I'm somewhat befuddled at what appears to be an extraordinary coincidence. A cubic model is a bendy affair and predictions using this start to look a little more scary, with May's figure predicted to be up at 234,599. If this model proves to be appropriate over the next few months then we may see as many as 3,628,011 to 4,459,707 adverse events come next December, which is a chilling prospect. Let us hope my fancy modelling of just four points is sheer nonsense.



11<sup>th</sup> April 2021

### VAERS III: Clinical Outcomes

For the period 15<sup>th</sup> December 2020 – 30<sup>th</sup> April 2021 VAERS reports the following event totals, for which I have calculated percentages of the grand total of 157,099 events:

- Life threatening event following vaccination – 3,274 (2.1%)
- Permanent disability following vaccination – 2,277 (1.4%)
- Death following vaccination – 3,700 (2.4%)
- Death or disablement following vaccination – 5,959 (3.8%)
- Death, disablement or life threatening event following vaccination – 8,662 (5.5%)
- Required hospitalisation – 10,692 (6.8%)
- Required a prolonged hospital stay – 150 (0.1%)
- Required the services of an emergency department – 21,573 (13.7%)
- Required in-hospital care – 27,234 (17.3%)
- All significant clinical outcomes – 30,981 (19.7%)

Aside from the startling figure of 5.5% of events involving death, disablement or a life-threatening condition, another figure we need to pay close attention to is the 17.3% of cases requiring hospital services. If the growth trend continues US healthcare services are going to get swamped, with the obvious knock-on effects for all other acute conditions. A final note concerns the VAERS definition of 'life threatening' – I

discovered that 3,586 entries classified as *not life threatening* were for folk who died. Bizarrely, the data reveals 3,586 out of 3,700 deaths were not life threatening (96.9%). Make of that what you will – these are bizarre times!

### VAERS III: Hospital Stays & Symptom Onset

For the period 15<sup>th</sup> December 2020 – 30<sup>th</sup> April 2021 VAERS holds a grand total of 157,099 adverse events. Herewith a summary of hospital stay and onset data:

- Mean time between vaccination and onset of symptoms – 2.94 days (St.Dev 6.74 days, n=137,416)
- Median time between vaccination and onset of symptoms – 1 day
- Mean time between onset of symptoms and registration in VAERS – 13.26 days (St.Dev 21.58 days, n=150,186)
- Median time between onset of symptoms and registration in VAERS – 4 days
- Mean duration of hospital stay – 4.11 days (St.Dev 4.64 days, n=7,138)
- Median duration of hospital stay – 3 days
- Total hospital stay – 29,491 days

We may conclude that the adverse reactions reported happened pretty quickly, with a reasonably prompt turnaround by VAERS. Hospital stays are thankfully short but even a short stay will require precious resources. Most folk concern themselves with the impact of the virus but that is only one side of the coin. Adverse reactions whether deadly, serious or mild are also going to take their toll and I see little or no planning for this by the authorities nor much understanding by the public of the greater problem faced by health professionals whenever mass vaccination kicks in.

12<sup>th</sup> May 2021

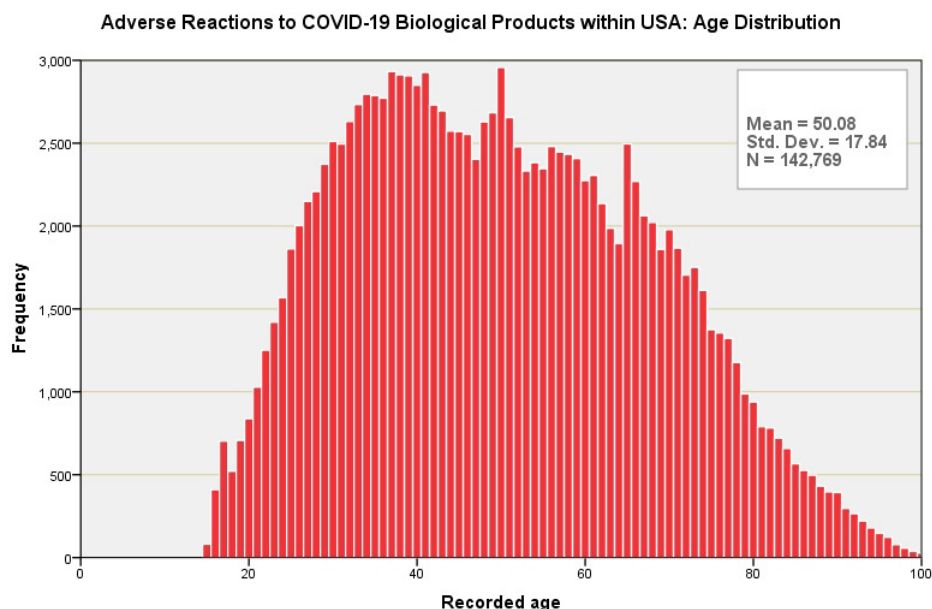
### VAERS III: Age & Gender Profile

There are a couple of surprises in store as regards the age and gender profile of those reporting adverse symptoms. Firstly, we see the majority (75.4%) of entries are made by women. Secondly, we see that women reporting adverse events tend to be younger than men, on average, by 3.8 years, this difference being highly statistically significant ( $p < 0.001$ ; ANOVA). I am not sure whether this is due to a tendency for women to report their health status more readily than men or whether they are suffering a greater range of more severe and different symptoms.

Gender differences like this are definitely something to chase, and a factor may be unequal distribution of vaccine makes within the data sample. Johnson & Johnson's Janssen jab features in reports for 31.2% of males (8,618/27,599), whereas Moderna's product only features in reports for 22.2% of males (14,452/65,174) with Pfizer's product sitting in the middle at 24.0% (13,947/58,089). The potential impact of this inequality will be investigated as I turn the handle.

I was somewhat surprised to learn the average age of reporting individuals across the US to be as low as 50.1 years, especially given the initial thrust of the inoculation drive to have been toward the elderly and vulnerable. That being said the elderly will not be fully represented in the sample for many reasons - many may well be neglected in terms of healthcare, many may not in a position to report problems or even desire to do so, and others sadly may no longer be alive. We need to remind ourselves that VAERS only captures 1% of problems that exist in the real world and failure to register reactions in care homes is going to be part of that reality.

|                  | Frequency                  | Valid Percent |
|------------------|----------------------------|---------------|
| Females          | 114,154                    | 75.4%         |
| Males            | 37,168                     | 24.6%         |
| Unknown          | 5,777                      |               |
| Total            | 157,099                    |               |
| Mean age females | 49.2 years                 |               |
| Mean age males   | 53.0 years                 |               |
| Difference       | 3.9 ( $p < 0.001$ ; ANOVA) |               |
| Mean age (all)   | 50.1 years                 |               |



Source: Vaccine Adverse Event Reporting System 15/12/20 - 30/4/21

### VAERS III: Gender Effects

For the period 15th December 2020 – 30th April 2021 VAERS holds a grand total of 157,099 adverse events. Following on from my post entitled *VAERS III: Age & Gender Profile* I now attach a screenshot of a top-line summary of investigations into gender differences. We now see that, although the majority of VAERS entries are from women (75.4%) and that these women tend to be slightly younger than men by 3.9 years on average, it is men in general who are suffering the most unpleasant side-effects with elevated stays and greater risk of serious or fatal outcome. In terms of all significant outcome (hospital stay, emergency department visit, life threatening event, disablement or death) then men are 1.46 times more likely to feature in VAERS than women and 3.86 times more likely to feature as a fatality. What kind of vaccine can discriminate on the basis of gender?

| VAERS reporting period 15 Dec 2020 - 30 Apr 21 (n=157,099) | Females | Males | Factor |
|------------------------------------------------------------|---------|-------|--------|
| Life threatening event                                     | 1.7%    | 3.5%  | 2.06   |
| Permanently disabled                                       | 1.2%    | 2.4%  | 2.00   |
| Died                                                       | 1.4%    | 5.4%  | 3.86   |
| Died or permanently disabled                               | 2.6%    | 7.8%  | 3.00   |
| Died, disabled or life threatening event                   | 4.0%    | 10.5% | 2.63   |
| Required hospitalisation                                   | 5.3%    | 12.3% | 2.32   |
| Required a prolonged hospital stay                         | 0.1%    | 0.2%  | 2.00   |
| Required Emergency Department                              | 13.8%   | 15.1% | 1.09   |
| Required in-hospital care                                  | 16.5%   | 21.8% | 1.32   |
| All significant clinical outcomes                          | 18.2%   | 26.5% | 1.46   |
| Mean duration of hospital stay (days)                      | 3.89    | 4.41  |        |
| Mean vaccination to symptom onset (days)                   | 2.75    | 3.39  |        |
| Mean symptom onset to VAERS registration (days)            | 12.61   | 14.06 |        |
| Median duration of hospital stay (days)                    | 3       | 3     |        |
| Median vaccination to symptom onset (days)                 | 1       | 1     |        |
| Median symptom onset to VAERS registration (days)          | 4       | 4     |        |

### VAERS III: Vaccine Reaction & Gender

In my post entitled *VAERS III: Gender Effects* we saw just that and asked why adverse reaction reports for males were turning out to be more severe in nature. There is, of course, the old argument that men, being macho, will hold back until their leg has fallen off before admitting to problems and that women are more in touch with their bodies. I'm not keen on wrangling with political correctness and have no published research to hand to tell me whether this is a possibility so I decided to let the data speak for itself.

Generalised Linear Modelling (GLIM) was used to investigate significant correlations between clinical course factors in the prediction of gender and a couple of surprises popped out. Firstly, death as a sole clinical outcome wasn't a useful predictor of gender ( $p=0.269$ ), neither was



disablement ( $p=0.905$ ), which suggests gender parity on these matters following vaccination. What *did* turn out to be statistically significant were age ( $p<0.001$ ), length of hospital stay ( $p=0.001$ ) and an interaction between life threatening events and death ( $p=0.002$ ). The latter wrinkle comes about because VAERS does not always consider death as a life threatening event! So far so good and all pretty much as expected – now comes the second and somewhat significant surprise...

It turns out that vaccine make is a statistically significant predictor of gender ( $p=0.029$ ), and this despite accounting for age, length of stay and death/life threatening conditions! The bottom line output from GLIM is a table of something called estimated marginal means and a screenshot is attached. In the top section of this (estimates) we see Johnson & Johnson's jab being represented by 41.37% of males, the Moderna shot by 41.62% of males and the Pfizer/BioNtech product by 38.38% of males. In the bottom section (Pairwise Comparisons) we get to see that there is just one statistically significant difference of 3.2% and that is between the Moderna and Pfizer/BioNtech mRNA jabs ( $p=0.011$ ).

In plain English this means there is an unexpected difference in the male response to what are supposed to be two identical mRNA shots, with the Moderna shot yielding slightly more adverse reactions in males than the Pfizer/BioNtech competitor. Nothing in this sorry business is ever what it seems!

### Estimated Marginal Means 2: Manufacturer

| Estimates       |       |            |                              |       |  |  |  |
|-----------------|-------|------------|------------------------------|-------|--|--|--|
| Manufacturer    | Mean  | Std. Error | 95% Wald Confidence Interval |       |  |  |  |
|                 |       |            | Lower                        | Upper |  |  |  |
| JOHNSON&JOHNSON | .4137 | .025       | .37                          | .46   |  |  |  |
| MODERNA         | .4162 | .021       | .38                          | .46   |  |  |  |
| PFIZERBIONTECH  | .3838 | .020       | .35                          | .42   |  |  |  |

Covariates appearing in the model are fixed at the following values: Recorded age=62.50; Days in hospital=4.10

| Pairwise Comparisons |                  |                       |            |    |      |                                             |        |
|----------------------|------------------|-----------------------|------------|----|------|---------------------------------------------|--------|
| (I) Manufacturer     | (J) Manufacturer | Mean Difference (I-J) | Std. Error | df | Sig. | 95% Wald Confidence Interval for Difference |        |
|                      |                  |                       |            |    |      | Lower                                       | Upper  |
| JOHNSON&JOHNSON      | MODERNA          | -.0025                | .020       | 1  | .898 | -.0409                                      | .0359  |
|                      | PFIZERBIONTECH   | .0299                 | .019       | 1  | .123 | -.0081                                      | .0679  |
| MODERNA              | JOHNSON&JOHNSON  | .0025                 | .020       | 1  | .898 | -.0359                                      | .0409  |
|                      | PFIZERBIONTECH   | .0324 <sup>a</sup>    | .013       | 1  | .011 | .0075                                       | .0573  |
| PFIZERBIONTECH       | MODERNA          | -.0324 <sup>a</sup>   | .013       | 1  | .011 | -.0573                                      | -.0075 |
|                      | JOHNSON&JOHNSON  | -.0299                | .019       | 1  | .123 | -.0679                                      | .0081  |

Pairwise comparisons of estimated marginal means based on the original scale of dependent variable Gender

a. The mean difference is significant at the .05 level.

13th May 2021

## VAERS III: Onset Of Symptoms & Death

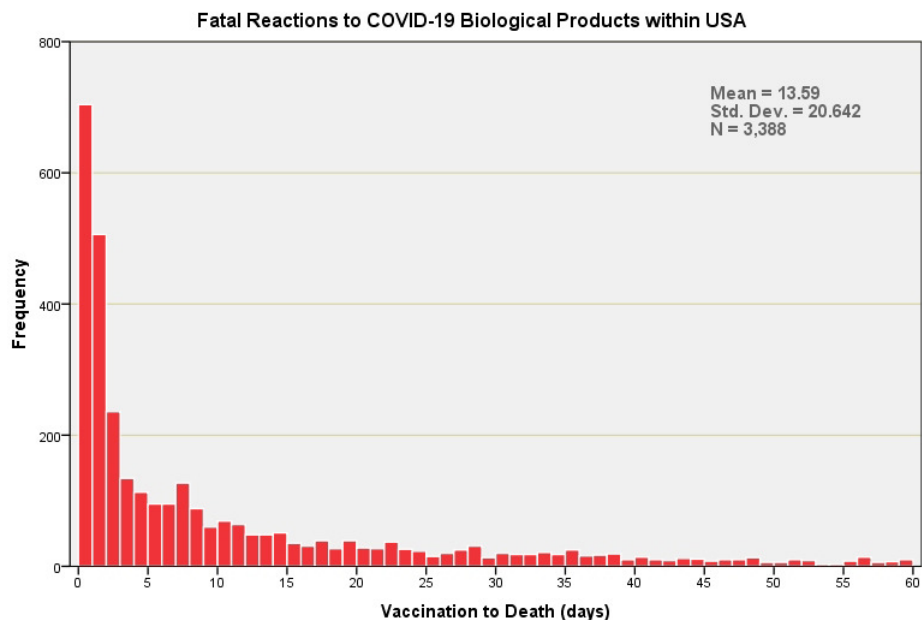
For the period 15th December 2020 – 30th April 2021 VAERS reports a grand total of 157,099 adverse events. This is an awful lot by any standards and the reaction of folk to this – especially those who ought to know better - is downright bizarre. In this post I thought we ought to take a look at how quickly these adverse symptoms set in, and to determine how quickly people are dying following vaccination.

The answer is very quickly indeed. Out of a total of 137,416 records possessing full date information we find 64,008 reports from folk suffering adverse symptoms the same day (46.6%) with a further 32,401 reporting symptoms the very next day (23.6%). Thus the great majority (70.2%) suffer symptoms sufficient to trigger a report within the first 24 - 48 hours after vaccination.

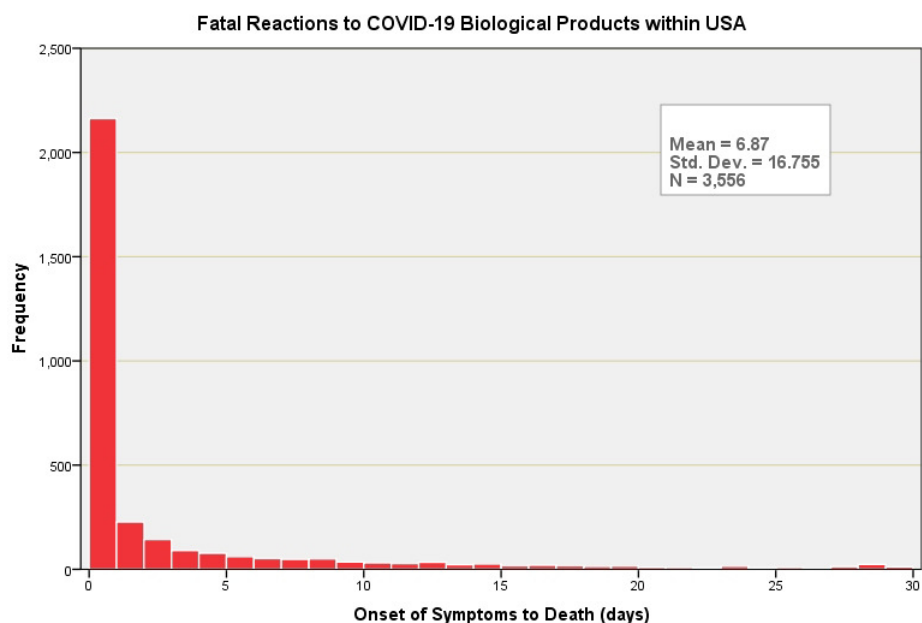
As regards death following vaccination we find 704 reports out of a total of 3,388 records possessing full date information indicating same day fatal outcome (20.8%) and a further 506 reports indicating next day fatal outcome (14.9%). Thus an astonishing 35.7% of people – just over a third - are dying with 24 - 48 hours of vaccination.

Of those whose initial symptoms were not reported as fatal, but who later died, we find no less than 2,390 records out of a total of 3,556 (67.2%) indicating death within the space of just two days of symptom onset.

And we are supposed to believe there is no causal connection, with these being coincidental reactions the authorities can safely ignore.



Source: Vaccine Adverse Event Reporting System 15/12/20 - 30/4/21



Source: Vaccine Adverse Event Reporting System 15/12/20 - 30/4/21

**14th May 2021**

### ***VAERS III: Vaccine Risk Profile***

For the period 15<sup>th</sup> December 2020 – 30<sup>th</sup> April 2021 VAERS holds a grand total of 157,099 adverse events. Raw counts by manufacturer will reflect doses issued more so than safety, these being Johnson & Johnson – 29,278 (18.6%), Moderna – 67,739 (43.1%), Pfizer/BioNtech – 59,575 (37.9%) and Unknown – 507 (0.3%). It is tempting to ask which vaccine is safest. Whilst we can't directly answer that without dosing data for each product what we can do is be sneaky and analyse *relative clinical outcome* to see if there is a preponderance of, say, death reports for one vaccine when compared to another, the assumption being the reporting rate for death should be equal across products if they are equally as safe.

Comparison is tricky because we've already noted a gender inequality in report distribution, and we can be certain that both gender and age will impact on clinical outcome, so what we have to do is take account of all of these factors all at the same time using something called

Generalised Linear Modelling (GLIM). This is a powerful statistical technique that enables us to see the genuine impact of a vaccine once confounding factors like gender and age are accounted for. I'll spare the gory technical detail behind this weighty analytical run and wade straight in with a summary slide of the bottom line results.

The first thing to note about these results is that they are adjusted for age, gender and product distribution across gender. For example, without any adjustment the incidence of death within the sample of 157,099 reports is 2.39% (3,700 deaths in 157,099 reports). Once we make adjustments for these three factors we find that the overall estimate for incidence of death drops to 0.82%, which is effectively an estimate of the risk of death for somebody at the sample average age of 50.1 years with a balanced number of males and females. This may sound crazy but until we make these critical adjustments using GLIM we cannot compare products since it is unlikely that age and gender profiles for recipients were identical across products – we must remember this is a retrospective observational study and not a clinical trial! Another way to think of this fiddling is that these adjustments will turn the raw and warty data into what we may expect from a clinical trial based on equal numbers of males and females, with equal representation for all age groups.

With that understanding under our belt we now see Pfizer/BioNtech's product is not faring at all well when compared to the others and leads the way in every single adverse clinical outcome. Those cells shaded pink are where the rate for Pfizer/BioNtech's product is statistically significantly different from the next nearest competitor at the 99.9% level of confidence ( $p < 0.001$ ) – this usually being Moderna's offering.

In contrast Johnson & Johnson's Janssen jab fares best in six of the eight categories, and significantly so in five of these at the 99.9% level of confidence ( $p < 0.001$ ), these being shaded green. This may sound like a big fat plug for vector vaccines but I am sure they'll have their own problems somewhere down the line. For one thing *this is an analysis of relative risk within an adverse report database* – we have no idea of what absolute risk within the population looks like until we obtain dose data. Again it is worth asking why two supposedly identical mRNA jabs are giving rise to such different results.

**VAERS reporting period 15 Dec 2020 - 30 Apr 21 (n=157,099)**

| <i>Clinical Outcome</i>                         | <i>All products</i> | <i>Johnson &amp; Johnson</i> | <i>Moderna</i> | <i>Pfizer/BioNtech</i> |
|-------------------------------------------------|---------------------|------------------------------|----------------|------------------------|
| Death                                           | 0.82%               | 0.62%                        | 0.91%          | 0.98%                  |
| Life threatening reaction                       | 2.22%               | 2.07%                        | 1.94%          | 2.72%                  |
| Hospitalisation                                 | 6.15%               | 5.32%                        | 5.93%          | 7.53%                  |
| Permanently disabled                            | 1.44%               | 1.08%                        | 1.35%          | 2.04%                  |
| Required Emergency Department                   | 14.90%              | 13.74%                       | 13.02%         | 18.38%                 |
| Death, disablement or life threatening reaction | 4.53%               | 3.53%                        | 4.52%          | 5.80%                  |
| Required in-hospital care                       | 18.86%              | 17.03%                       | 17.33%         | 22.60%                 |
| Any significant clinical outcome                | 21.27%              | 18.38%                       | 20.08%         | 25.84%                 |

*Report rate adjusted for age, gender and product distribution across gender*

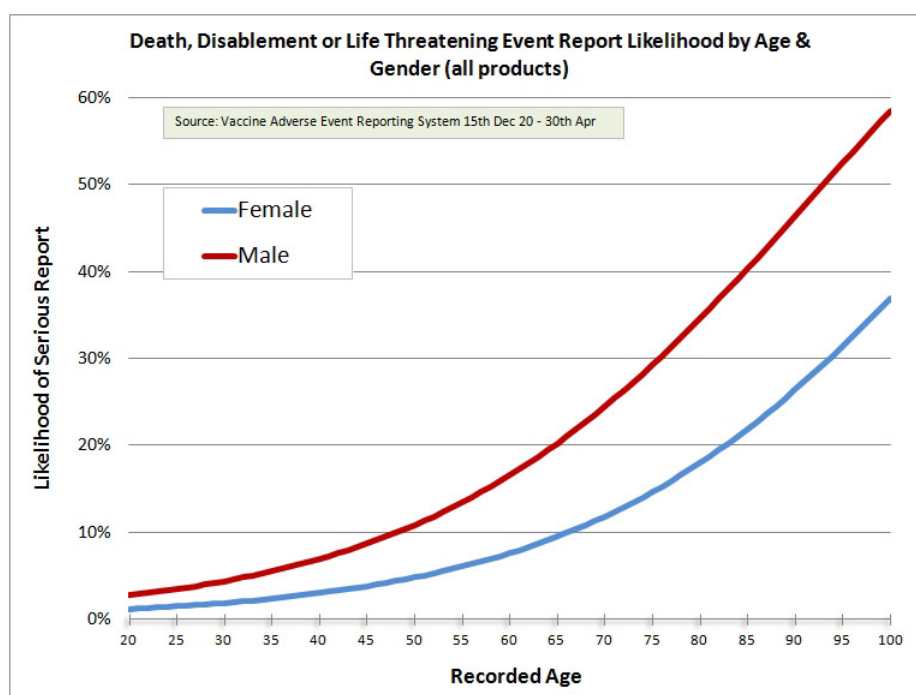
### **VAERS III: Serious Outcome Report Likelihood – all products**

For the period 15th December 2020 – 30th April 2021 VAERS holds a grand total of 157,099 adverse events, 8,662 of which were classified as life threatening, causing permanent disability and/or death (5.5%). I have now managed to develop logistic regression models for such serious outcomes to establish the impact of age, gender and product. Logistic regression sounds all fancy but it is simply a statistical method for predicting a yes/no outcome among people, being a most valuable tool in medical science.

The rather technical output of logistic regression modelling can be turned into rather colourful plots that most folk will find intuitive, so let's start with our very first plot. For this I have lumped all COVID-19 biological products together and separated the effects of age and gender. These two curves reveal the likelihood finding serious outcome reports within our sample of 157,099 adverse incident reports. This isn't the same as measuring risk of serious outcome within the population at large but may be considered a rough proxy.

A key thing to grasp here is that we are looking at the probability of serious outcomes being registered with an entirely voluntary database for which an audit revealed a 1% response rate from the public. Whomsoever desires to hand reports in is going to bias the results like crazy, and this may well explain some of the gender differences. We should ask why we live in a world that doesn't have mandatory and rigorous follow-up for all medications by the various authorities. It can certainly be done because I was the project lead for one of the world's most comprehensive databases for tracking cardiac surgery outcomes (please ask if you want to see annual audit reports).

That's enough ranting... as we may see from the attach plot likelihood of a serious report rises rapidly with age, with males associated with a greater likelihood of reporting than females at all ages, though there is little difference down in the 20 – 30 age band. This underpins previous findings of gender differences.

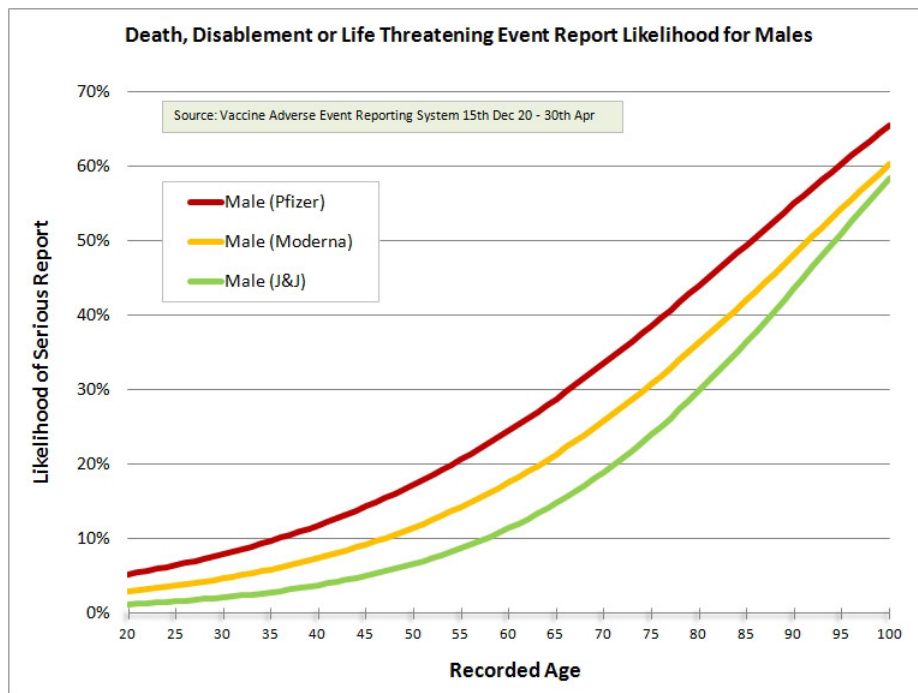
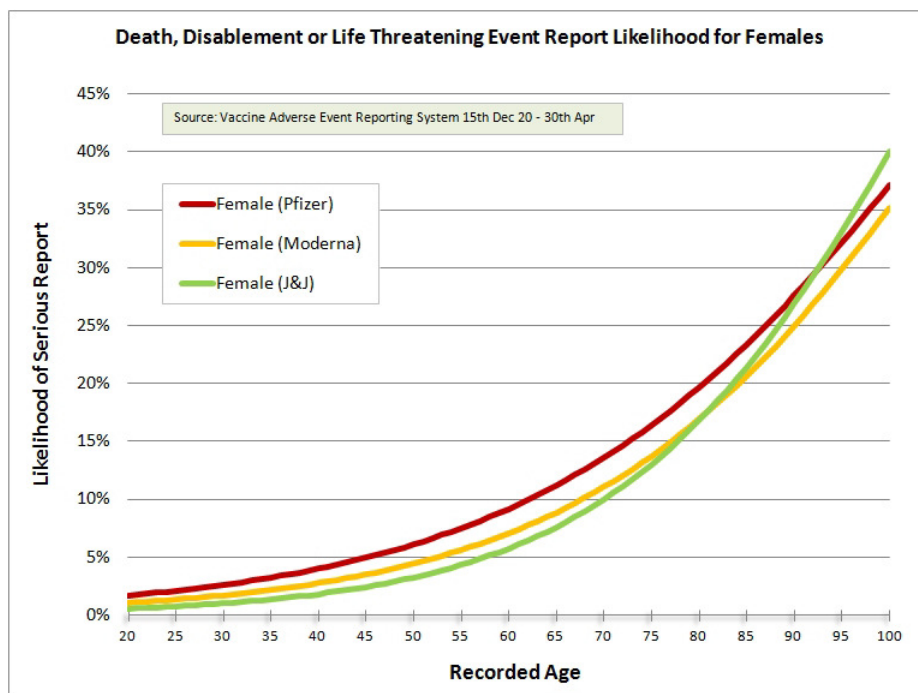


### ***VAERS III: Serious Outcome Report Likelihood – gender & product effects***

For the period 15th December 2020 – 30th April 2021 VAERS holds a grand total of 157,099 adverse events, 8,662 of which were classified as life threatening, causing permanent disability and/or death (5.5%). In my previous post entitled *VAERS III: Serious Outcome Report Likelihood – all products* we saw the results of logistic regression modelling that revealed how likelihood of serious outcome reporting rises sharply with age, with males exhibiting a greater reporting likelihood than females. In this post I am going to repeat the process but this time we shall take a look at the impact of product.

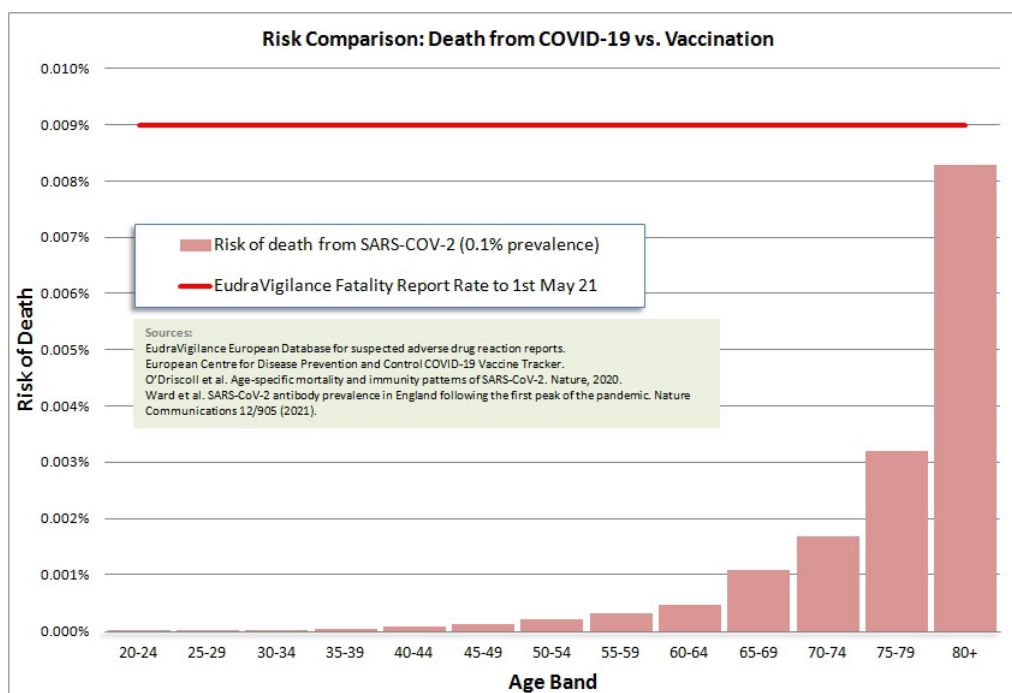
In this first slide for males we see the Pfizer/BioNtech product faring badly in comparison to others, as discussed in my post entitled *VAERS III: Vaccine Risk Profile*. Interestingly, the greatest absolute difference between likelihood of reporting occurs in the 50 – 70 age band, with the gap narrowing as we approach the nonagenarians. Johnson & Johnson, with their vector vaccine, would no doubt be chuffed to see this but, of course, we are barely scratching the surface of vaccine safety even with 157,099 records within VAERS!

In this second slide for females something kinky and unexpected happens. Firstly, there is little difference between all three products and secondly, the Johnson & Johnson Janssen jab twists across the others to become the leader among nonagenarians. Whatever women are doing report-wise, and whatever is happening to them sure looks different to what men are doing. All very curious.



### Chani's Chart

Chani Leahong has been quick to note that, with the declaration of an official viral prevalence of 0.1% (1 in 1,000 people) by the UK government yesterday, we can re-draw the chart presented to the group on 6th Mar 21 (under a post conservatively entitled 'Risk Comparison') and see how risk of death from SARS-COV-2 viral infection under a national prevalence of 0.1% across age groups compares with the flat rate of 0.009% obtained from EudraVigilance and ECDC data. I'm not sure I need to say anything other than henceforth this shall be known as Chani's chart. Well done Chani for being as sharp as razors, as my old mate used to say!



15<sup>th</sup> May 2021

## The Morris Oracle

I've had some cracking discussions with Dave Morris down in various threads regarding nominal test sensitivity, specificity, disease prevalence, bench-marking and gold standards (lack thereof) and decided to treat everyone to a single slide that summarises everything we need to understand about false positives.

In plain English a false positive is when we tell somebody they are infected with a disease when they are not. All diagnostic tests have their limits and the RT-PCR test is no exception, but what governments and their expert advisors are doing is completely ignoring this basic fact and assuming everybody who tests positive is either sick with COVID symptoms, infectious or carrying the SARS-CoV-2 virus. Nothing could be further from the truth, as you are about to see for yourselves.

For this analysis I've set test sensitivity at a nominal 80% (a figure supplied by the Centre for Evidence Based Medicine at Oxford University). This figure tells us how good the test is at detecting presence of the virus in infected people and an 80% sensitivity means that the test will detect 8 out of every 10 infected people, thus 2 people will go home being told they don't have the virus when they do.

RT-PCR test specificity is a most controversial subject, with initial nominal estimates set at 99.9%. This figure is essentially a guess based on previous research, bench studies and hand waving, with experts arguing over what the real figure is. Specificity tells us how good the test is at detecting absence of the virus in uninfected people, and 99.9% specificity means that the test will accidentally yield 1 infected case out of every 1000 uninfected cases, thus this person will be told they are carrying the virus when they are not.

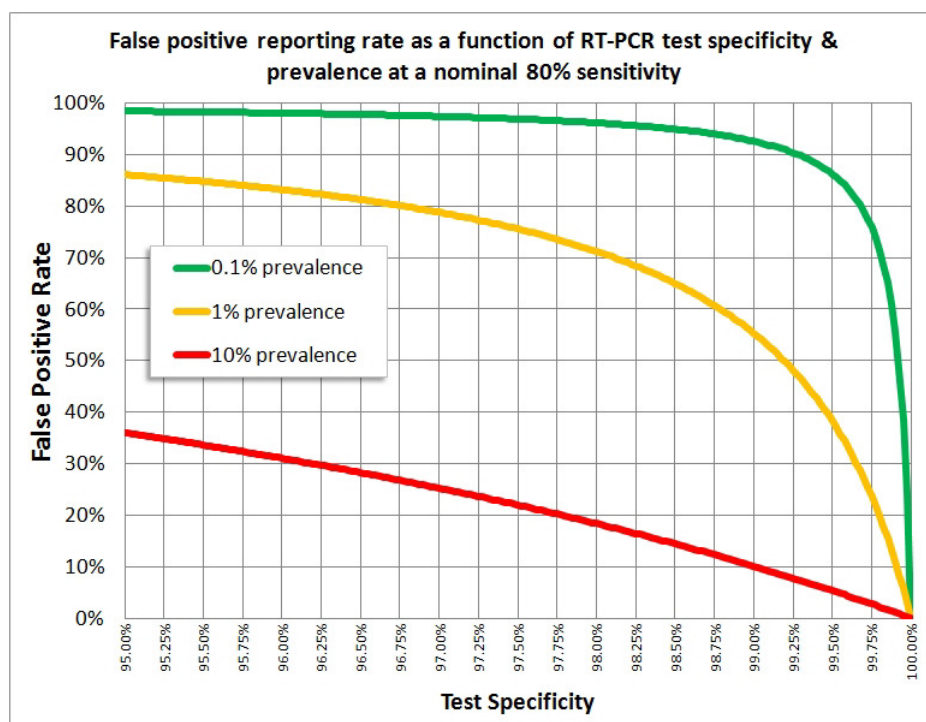
What complicates matters is how much disease there is in the population. We call this prevalence and 1% prevalence means 1 in every 100 people are carrying the virus (SARS-CoV-2) that causes the disease we call COVID-19. When a viral infection is highly prevalent diagnostic tests work well, but when prevalence starts to wane diagnostic tests start to produce nonsensical results. Prevalence is another of those controversial guesstimates because it is hard to measure reliably and yet the latest UK government report suggests this may now be down to 0.1% (1 in every 1,000 people).

This chart – dubbed the Morris Oracle after Dave Morris – enables you to see just how false positive cases are being generated for differing levels of test specificity for three levels of prevalence for an assumed nominal sensitivity of 80%. The first thing to notice is how low the red line is compared to the others. This reminds us that few false positives are generated when the virus is rampant at 10% prevalence.

With UK government estimates now down at 0.1% prevalence (green line) we can see that false positives are going to rocket at anything below the nominal 99.9% specificity. Since operational specificity (real world specificity) is likely down at 97% or even 95% we now see that virtually every positive test result the government is counting as a 'case' is almost certainly a false positive.



With estimate of prevalence down at just 6% for England even during the peak of the outbreak (Ward et al Nature Communications 12, Article number 905. 2021) and operational prevalence likely lying somewhere between 95% and 97%, then we can safely assume that lockdown, mandatory masks, social distancing, closure of health services, destruction of businesses, damage to the economy and all the rest of the shit shovelled upon us has been built on nothing more than a gigantic fiction so huge and so fraudulent that the public cannot even see it. Perhaps they dare not see it for the price of listening to a few alleged experts has been great and terrible.



16<sup>th</sup> May 2021

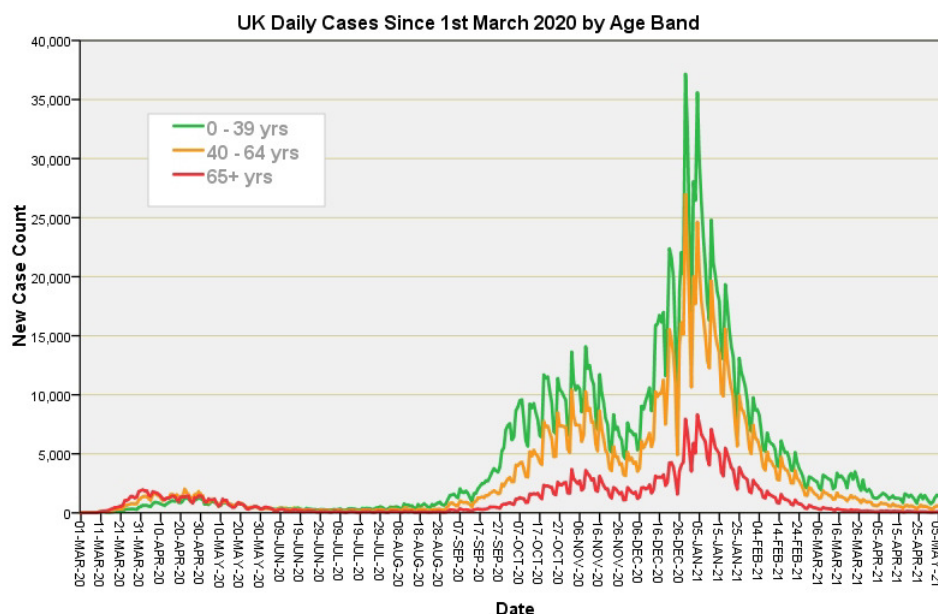
## Age Analysis

Public Health England (PHE) put out a colourful chart every week revealing case count per 100k population by age band. Every time I see this I make a comment to the effect that it is garbage since comparison rests on the assumption that test rates across age groups are equal. For example, if we stopped testing everyone under 15 then the curve for this age group would fall to zero! This is because what is being called a 'case' isn't a genuine clinical case as such and is merely a positive test result; more results mean more 'cases'. Surprisingly, a large slice of the public don't understand this basic logic and some get rather unpleasant when I criticise PHE's efforts.

This morning I tried to obtain data from UK GOV to see what PHE's chart should look like if we make adjustments for differing numbers of tests across age bands. It will come as no surprise to folk here that I cannot obtain the data I need. In the process I discovered 3 flaws in UK GOV data tabulation that I've grumbled on about in an email to the project lead. I did eventually manage to produce a spreadsheet with nationwide daily case counts by age band and total daily numbers of tests (sadly not by age band) and discovered something rather unexpected.

In the slide below I present daily case counts grouped by three age bands for the period 1st March 2020 – 10th May 2021. Though hard to see because of the scaling the pandemic starts off with the most elderly group dominating the count, as we may expect. From September 2020 onward we see a rather strange inversion, with the youngest age group now dominating the case count. Bizarrely, the most vulnerable and at risk age group didn't really feature much in the so-called "second wave" – what kind of disease starts out hammering old folk then switches to hammering young folk?

My guess is that this second wave of young things last winter is merely a function of the national test strategy. We could call it the poking disease. We poked lots of younger people up the nose with lateral flow tests for one thing (many employers were keen on deploying kits), and then we decided to poke kids up the nose at least twice a week (as if double maths isn't bad enough). All that poking with lateral flow kits resulted in greater PCR follow-through, and this brought heaps of positives, and false ones at that.



Source: <https://coronavirus.data.gov.uk/>

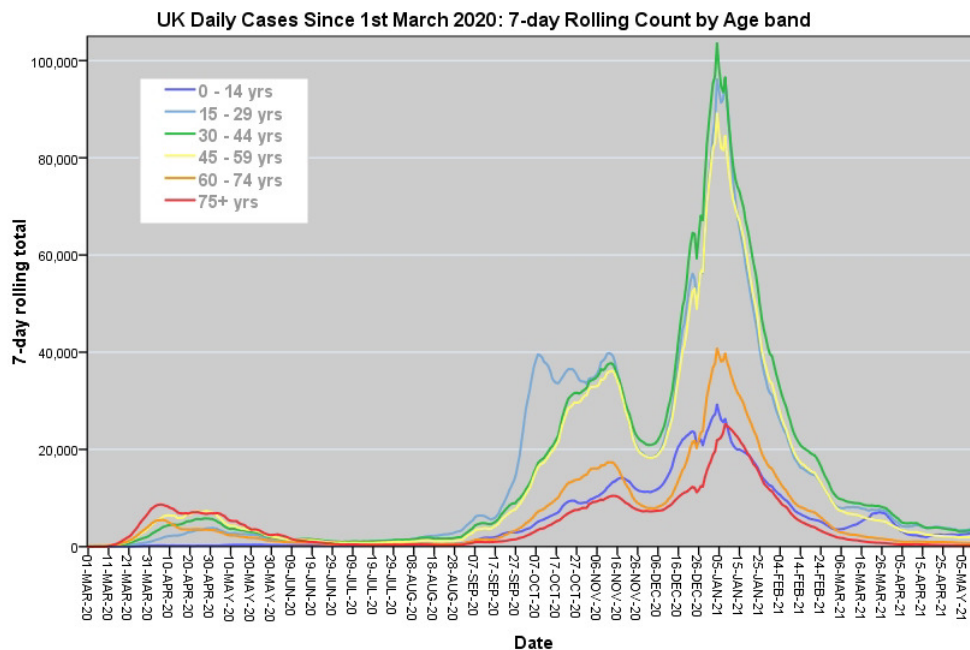
## Age Analysis II

Regulars will realise by now that I'm going to reach for a spanner in my bag called Generalised Linear Modelling (GLIM). This is a mighty powerful tool and I've gone and I shall be using it this afternoon to see how well I can predict the number of cases in each six age bands (0 – 14, 15 – 29, 30 – 44, 45 – 59, 60–74, 75+) using just test counts alone. The problem with daily data series is that they are often subject to peaks and troughs brought about by weekends and bank holidays. On top of this there are time lags between declared positive case counts (defined by earliest specimen date) and declared numbers of tests (defined by publication date), so I decided to derive 7-day rolling counts for cases and 7-day rolling counts for tests to iron out some of these wrinkles.

Just to check everything had gone fine I decided to plot the case counts by age and came face to face with another bizarre finding. In the attached slide you'll see a remarkable leap in the 7-day case counts for the 15 – 29 year age group just after 17<sup>th</sup> September 2020 that is not matched by other age groups. I presume this was caused by mass testing of older children as they returned to school and is further proof of a 'testdemic'.

With a so-called "second wave" on the way during October of last year we may ask just why cases across all age groups abruptly declined toward the end of November and into early December. Could it be testing was relaxed in both volume and cycle threshold in order to permit the illusion of a winter peak? Perhaps SARS-COV-2 took an early vacation.

We now come to the great winter peak of 2020/21, where we magically shift from 20,000 cases per rolling week to just over 100,000 cases per rolling week in the space of just one month despite people being masked and locked down. How is this possible and how is it possible that the peak should disappear again so rapidly? What stands out for me most about this strange peak is that it is predominantly the 15 – 29, 30 – 44 and 45 – 59 year age groups, and high on identical counts at that! Bizarrely, the two groups normally clobbered by influenza, being the very young and very old fared rather well last winter. We must either conclude that SARS-COV-2 can tell your age or the majority of positive cases are arising from a PCR test that is not fit for purpose.



Source: <https://coronavirus.data.gov.uk/>

### Age Analysis III: GLIM

I've reached for that spanner in my bag called Generalised Linear Modelling (GLIM) and I've used it to see how well I can predict the number of 7-day rolling cases in each of six age bands (0 – 14, 15 -29, 30 – 44, 45- 59, 60-74, 75+) using numbers of tests alone. What I have discovered has totally blown my mind.

In fiddling about with GLIM all three types of test stood out as key to the prediction of 7-day rolling case counts by age, these being the number of RT-PCR tests, the number of lateral flow tests, the number of antibody tests plus interactions between lateral flow and antibody tests and between PCR tests and antibody tests.

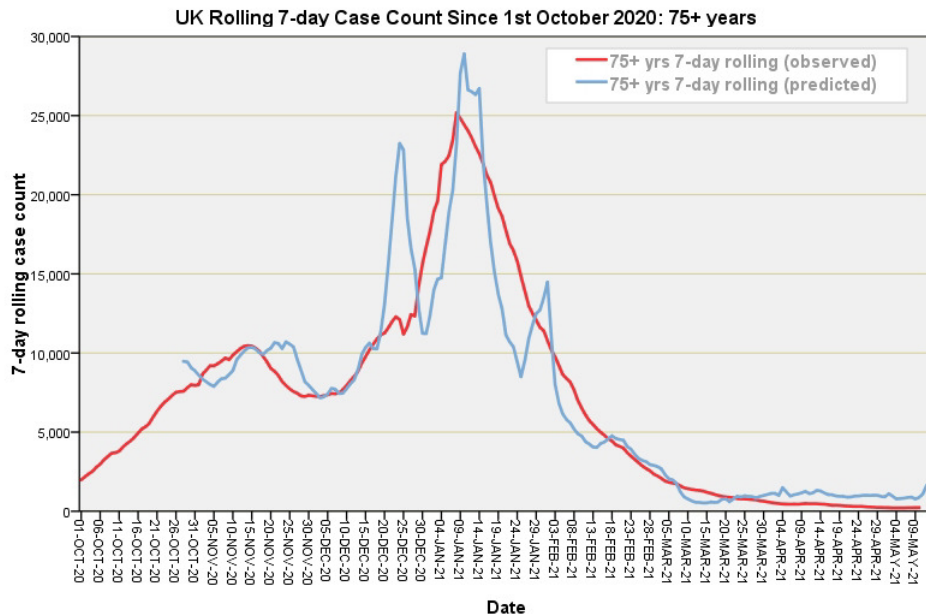
I'll spare the gory details of the models and report that Pearson bivariate correlations between observed daily counts and predicted daily counts within each age band ranged between an astonishing  $r=0.906$  for the 60 -74 years group ( $p<0.001$ ,  $n=195$ ) to a gobsmacking  $r=0.926$  for the oldest group of 75+ years ( $p<0.001$ ,  $n=195$ ). In plain English this means using just the number of different tests and only the number of tests we can explain 82% - 86% of the variation we see in 7-day rolling case counts. This is utterly mind blowing and is evidence of what some are calling a casedemic (though it really is a testdemic).

The first slide reveals just how well we can predict positive cases from a consideration of the number of tests alone for the oldest age band of 75+ years. Striking isn't it? We may note that the first predicted peak between 20<sup>th</sup> December and 30<sup>th</sup> December seems to flag up a modelling discrepancy but this coincides with the Christmas holiday which means cases would not have been processed as usual, with declarations made much later than normal.

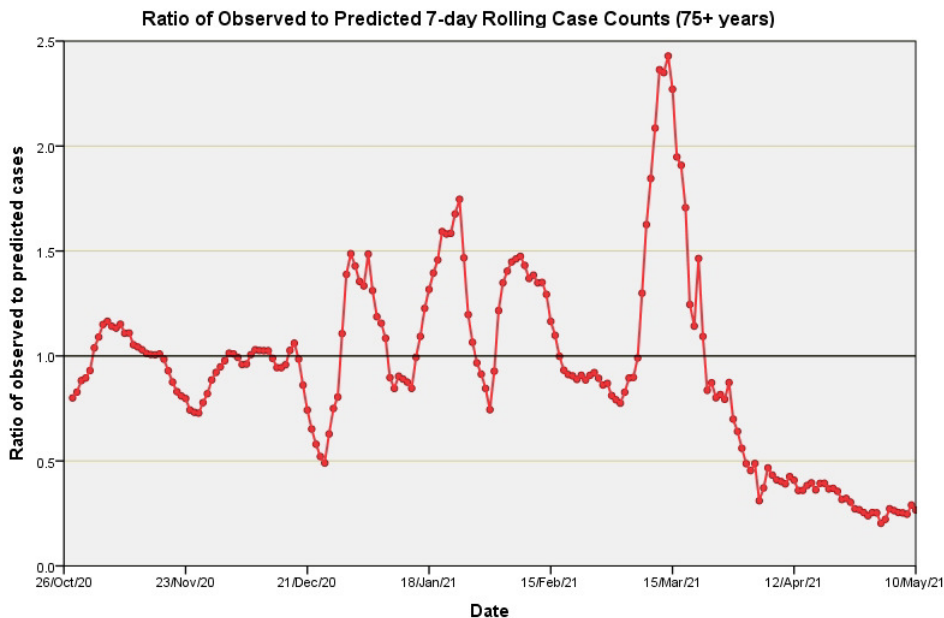
Declaration of case and specimen dates is another of those 'funny business' areas in which we find data authorities playing musical chairs with dates (please see my compiled PDF file for 2020 for examples of death date shuffling). One thing the authorities cannot afford, of course, is to have an inexplicable double-peak with trough slap bang in the festive season. I would also suggest the third test peak of early February has possibly been discreetly smoothed in this manner.

Sticking with the same age group of 75+ years we can now do something sneaky and that is to calculate the ratio of observed to predicted values. In this second slide we see this ratio bobbing about the unity value of 1.0, which suggests 7-day rolling case counts are simply following the test numbers as the GLIM model predicts. There is a notable departure around 15<sup>th</sup> March which could either be a genuine virus doing a genuine thing or a decision to hike the RT-PCR cycle threshold to generate a fresh batch of cases. This particularly sharp peak is not very viral-like in dynamic and is rather more indicative of short-term laboratory policy changes.

At some point the government will want evidence that the vaccines are working and the easiest way to obtain this is to start lowering the RT-PCR cycle threshold to reduce the number of false positives per test over time. My well-fitting GLIM model doesn't realise this, of course, and so will start over-predicting positive cases in a systematic manner once the policy decision has been taken. This is precisely what we see happening after that mid-March peak, with a steady decline in the ratio to well below 0.5. Either a genuine virus is in genuine decline as a result of seasonality and/or effective vaccine rollout or RT-PCR cycle threshold is being lowered – the choice is yours!



Source: <https://coronavirus.data.gov.uk/>



Source: <https://coronavirus.data.gov.uk/>

**18<sup>th</sup> May 2021**

## UK Big Picture

I've been up since 5am putting together an automated batch file system to enable me to pull down data from UK GOV at the touch of a few buttons. In doing so I've unearthed a few glitches and I'm now in correspondence with the coronavirus dashboard team. To test batch processing out for all four nations making up the UK (Scotland, Ireland, Wales & England) I knocked out a few UK-wide charts and thought this one might go down a treat, being everything folk like to know in one colourful display.

New cases (specimen date) are positive PCR test results and nothing more. We shouldn't be calling them cases and we shouldn't be using a test that is not fit for purpose, but there you go. These are counted according to the date of the earliest swab rather than the date on which the authorities decided to announce the results (publication date). We should note that many folk will be tested more than once and so will be counted more than once.

New admissions sure sounds like the number of folk sick with COVID going to hospital for treatment but this is far from the case. Admission may be for any reason whatsoever – so long as the admitting patient tests positive then they'll count as a COVID case. Testing positive does not mean they are sick with COVID or carrying any virus (false positive). An admission need not lead to a bed stay, whether day bed or overnight bed and can be self-admission.

COVID Hospital Cases sounds the business but it is not. These folk are in-patients who test positive during their stay; they are not necessarily in hospital because of COVID. Somebody in hospital for a hip operation will count as a case if they happen to test positive. Testing positive does not mean they are sick with COVID nor carrying any virus (false positive).

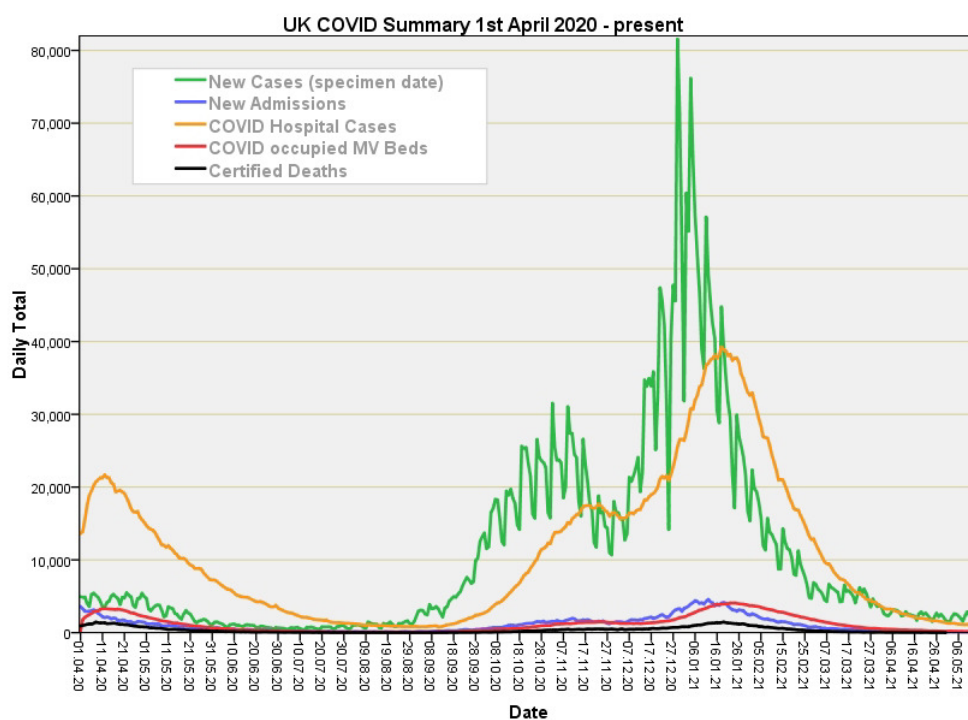
COVID occupied MV Beds sounds serious business. It is indeed, but it is not necessarily serious COVID business. Patients with both acute and chronic respiratory conditions (a major killer in the UK) will continue to require high-end treatment, but if they happen to test positive they'll be counted as a COVID case even if they are not carrying any virus (false positive).

Certified Deaths sounds like genuine COVID business but again it is not. If certifying physicians rely on PCR test results then false positives are also going to land on the death certificate. Certified doesn't necessarily mean causal since it can refer to COVID as a co-morbidity (section II certification). On top of this the automated cause of death software known as MUSE (Multicausal and Unicausal Selection Engine) will override anything written by the certifying physician to ensure WHO guidelines are followed rather than the medical reality.

With that understanding in place let us have a look at some peculiar features, starting with the big orange hump back in April – June 2020 that tells us the initial outbreak was largely among existing inpatients already in hospital for something else other than COVID. Inpatients don't tend to commute or go partying so how did a nation of inpatients suddenly get sick all at once? Are we talking an army of well-meaning super-spreaders bearing grapes and contaminated cheap magazines... or perhaps a test that generated a heap of false positives?

We also see an autumnal mini-wave of new cases that didn't translate into MV bed use or deaths. Did the virus suddenly lose its nerve? Bizarrely, this mini-wave of new cases converted into inpatients directly without an attendant rise in new admissions. What we have, then, is a virus without sufficient potency to get folk coming in through the doors that somehow bumped numbers of folk already in hospital. If the PCR test produced nothing but false positives yet was used extensively in healthcare settings as the NHS opened its doors again then this phantom orange rise is what I'd expect to see. Ditto the classic winter peak

No doubt there's more bizarreness to figure but right now I need a cold beer. The best explanation I can muster is that there isn't a virus, merely a test that purports to show a virus but I shall continue to dig!



Source: <https://coronavirus.data.gov.uk/>

19<sup>th</sup> May 2021

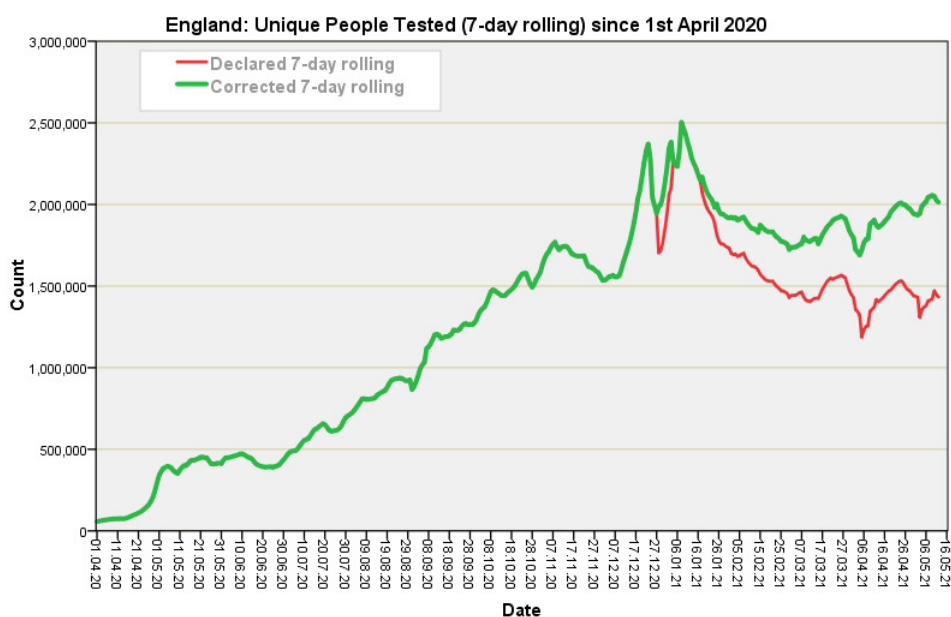
## Unique People Tested

We get to hear a lot about the zillions of tests being undertaken and the millions of positive test outcomes that governments prefer to call a 'case' these days, even though its only a swab result with a high probability of being in error. I have mentioned that folk being tested more than once get counted as a 'case' more than once if they return a positive test, so it's pretty important to know just how much double, triple and quadruple counting is going on so we may better judge what is exactly happening as opposed to what the media and authorities claim is happening

A while back I undertook a mini-project on bed occupancy using data provided by the NHS and discovered that hospital admissions were being multiply counted. This would occur, for example, with somebody going for dialysis or chemotherapy on a regular basis - if they tested positive at any point then a course of 13 visits for that patient would count as 13 COVID admissions. Across the 315 service providers of NHS England I calculated a median admission bias factor of 2.3x; thus each patient, on average, is generating 2.3 so-called 'admissions'. I wondered if the same bias factor applied to testing and so set about pulling down data for the unique number of people tested from UK GOV.

This is where the fun and games began for I discovered that for the official 7-day rolling summation data to hold its numerical course then negative entries totalling some 5,044,326 unique persons must have been entered onto the system. This isn't just about missing data; this is about negative values being entered into the system! I alerted group members to this nonsense in a post entitled 'Negative People!' and since then I have been able to use statistical techniques to remove the 18 negative person counts and replace them with robust estimates of what the true count should have been. As a result I have been able to derive what the true 7-day rolling summation for unique people being tested should be for England.

This result should speak for itself - that is some serious discrepancy isn't it? The knock-on effect will be elevation of any rate estimates made using the number of people tested. In plain English, the outbreak will look worse than it is if we try to calculate infection rates (positive tests per person).



20<sup>th</sup> May 2021

## Test Application Rate

In my previous post entitled Negative People! we got to learn how official data sitting on UK GOV servers contains negative numbers of people being tested – some 5,044,326 negative people to be precise. I wrote to the project lead pointing out the ghastly flaw in a most friendly manner but I haven't had a reply as yet. Consequently, I went and replaced 18 sets of negative numbers with something far more sensible derived from statistical modelling of the remaining data, the impact being summarised in my post entitled Unique People Tested.



This morning we are going to see why counting the actual number of individuals involved is rather important, but some of you no doubt have already realised the government's game and that is to use a single individual to generate many cases and many admissions to hospital.

We shall start by looking at the number of times a person gets swabbed or poked. To generate this slide I derived 7-day rolling summations of virus tests undertaken (both PCR and lateral flow varieties), 7-day rolling summations of PCR tests alone and 7-day summations of the number of individuals subjected to testing.

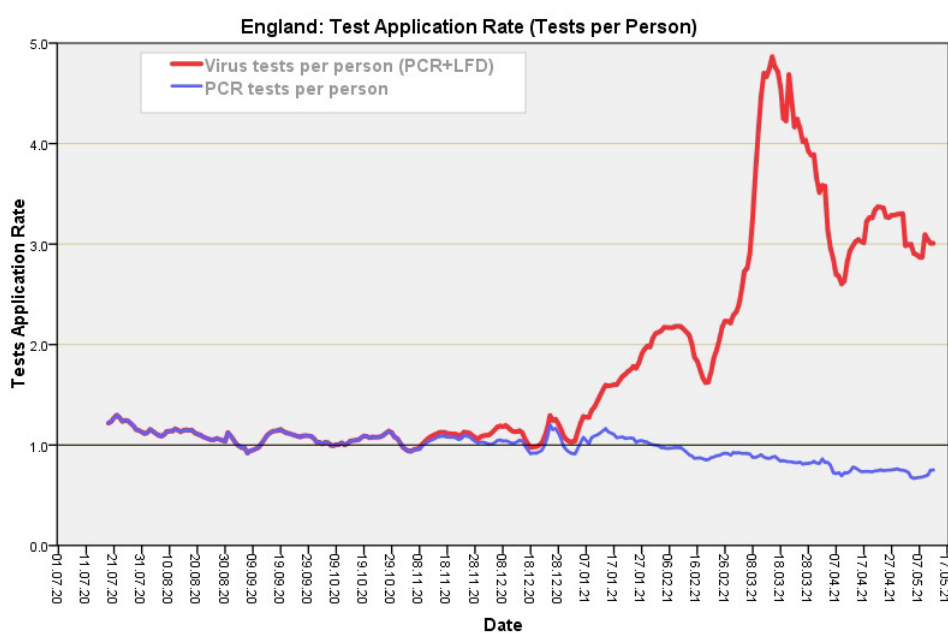
If the phrase 7-day rolling summations hurts the brain think of it as a weekly total, with each week progressively starting on a new day. The reason we flip to using 7-day summations is because weekends play havoc with data processing, with weekend counts often being dumped onto Monday. Such a summation usefully irons out administrative issues and stabilises the numbers. Once we have 7-day summation data for tests and people tested we simply divide one by the other to see how many times individuals are being swabbed, on average.

In the attached slide it is abundantly clear that 1 swab up 1 nose was pretty much the norm from the beginning of data collection right up until January 2021. We also see it was the PCR test that ruled the roost back then. After January 2021 everything changed. Not only did PCR testing give way to lateral flow but we went crazy and started poking people up the nose as if there was no tomorrow.

Nose poking reached a peak pretty much close to 5 pokes per person in mid March 2021, after which some employers and some headmasters may well have seen sense to bring it down to a slightly less idiotic 3 pokes per person.

The number of false positives we are going to be generating from this is breathtaking. Assuming an overall operational test sensitivity of 80%, a somewhat generous combined test specificity of 95% and an officially declared prevalence of 0.1% then my calculator indicates a grim test reality that is generating 98.4% false positives. We are poking folk for nothing!

In pursuing mass testing we are flushing serious amounts of money down the drain at a time when the economy is likely broken and beyond repair. We are subjecting citizens to repeated invasive procedures that have absolutely no clinical value, and we are pursuing this worthless goal with increasing vigour; in effect our employer and our school have now become our physician. No doubt sadists and shareholders will be equally pleased.



Source: <https://coronavirus.data.gov.uk/>

### ***Impact of vaccination on household transmission of SARS-COV-2 in England***

This is the title of a report prepared by Public Health England (PHE) that came out last April, causing quite a stir. I say 'came out' because it didn't manage to receive peer review nor did it appear in a quality journal, it effectively being an internal document issued as a PDF. A great gift to the media, government, experts, authorities and manufacturers alike, this report appeared to provide the first solid evidence that vaccination reduces transmission, with the conclusion:

*These results show that the likelihood of household transmission is 40-50% lower for households in which the index cases are vaccinated 21 days or more prior to testing positive (compared to no vaccination), with similar effects for both ChAdOx1 nCoV-19 and BNT162b2 vaccines.*

A hard copy has been sitting in my in-tray for a week and I've tried to muster the desire to wade through yet another turgid government report to ensure it passes muster. I've now had a chance to give it some consideration and, once again, it doesn't pass muster! In fact, it doesn't pass muster in a rather glaring way; I shall explain in four bullet points.

1. The entire premise of the study rests on the assumption that members of households only interact with each other in terms of SARS-COV-2 transmission. The idea behind the study is a good one in theory – determine if other people within a household are infected 2 – 14 days after an index carrier and establish if vaccination prevents this – but a poor one in practice since we have no idea what household members will have been doing with their lives.
2. The study ignores likely behavioural differences between households. Members of households keen on vaccination are likely to behave differently to members of households not keen on vaccination. These behaviours will lead to differing levels of exposure, for which no compensation was made.
3. The study start date for indexed (primary) cases was 4th January 2021 but since a 21 day window post-vaccination was required for vaccinated index cases then the earliest start date for these was 25th January 2021. This introduces a significant bias whereby data for un-vaccinated households from 4th January onward during a period of higher background rate of infection (prevalence) were compared with data for vaccinated households from 25th January onward during a period of lower background rate of infection. Variation in case counts for England over this time period reveals a 51.5% reduction, of which PHE estimated a 40%-50% reduction allegedly due to vaccination.
4. Propensity adjustment was not undertaken in order to account for variation in disease prevalence both spatially and temporally. Whilst PHE analysts opted for region and calendar week indicator variables these are no substitute for regional and weekly infection rates. Propensity adjustment in retrospective observational clinical studies is a fundamental prerequisite and failure to incorporate this into modelling represents a major study weakness. It is likely that the results obtained stem from this singular oversight.

My conclusion is that PHE undertook an impressive study involving 552,984 households and 1,449,427 contacts, that was backed by extensive multivariate logistic modelling but which failed to account for changes in actual exposure to SARS-COV-2 of those contacts across regions and over time. The study also rests on the thin premise that household members only reacted with each other over a span of 70 days, which stretches incredulity somewhat. On this basis folk are being convinced by authorities and the media alike that vaccination reduces transmission when in all likelihood it does not (the spike protein is not the means of transmission).

I am tempted to place a FOI to obtain the dataset and expose the methodological flaw by re-running PHE's logistic regressions using propensity score adjustment to take account of variations in disease prevalence. Ironically, last time I did this I helped bail one of Bayer's products (please ask if you want to see my Lancet paper).

**21<sup>st</sup> May 2021**

### ***Impact of vaccination on household transmission of SARS-COV-2 in England – further considerations***

In my first post on this study of significance I provided four bullet points summarising design and methodological issues that would have been sufficient for it to fail proper peer review. Setting aside the fallacious assumption that household members remained in perfect isolation such that other household members and only other household members were capable of infecting one another, we arrived at the tricky issue of background infection variability and household members' exposure to this. I noted that the time periods for vaccinated index and non-vaccinated index household members differed, with data for non-vaccinated index members starting 21 days earlier on 4th January 2021, as opposed to 25th January, and indicated this would greatly bias results owing to significant decline in disease prevalence over this time. This led to mention of the need for propensity adjustment in the statistical modelling of retrospective observational clinical studies and PHE's failure to do this. This morning I'd like to delve a little further...

In a well-designed clinical trial we balance our randomised samples across demographic, medical and other factors so that we can be confident in comparing groups under study. With data gathered from the public at large we don't have this luxury and must resort to using multivariate techniques to absorb variation due to age, gender, socio-economic group and so on before we can say anything about efficacy or safety of treatment. Within a population the propensity for developing a medical condition is never equal even when age, gender, SEG etc have been taken into consideration, an example being increased likelihood of renal failure in cardiac patients presenting for surgery. If we don't adjust for this initial propensity we cannot say anything about the likely impact of a drug deemed to be causing renal failure during surgery.

In the matter of PHE's household study we find failure to account for the propensity of household members to be infected with SARS-COV-2 as disease prevalence changes over time. Turning to supplementary material S1 of the report we see a covariate called index case date (a factor variable representing a series of 8 weeks) yielding highly significant values of ( $p < 0.001$ ) for each and every week. This is telling us that the passage of time is important in determining the odds ratio of a household contact becoming a secondary case. PHE interpret this as being due to progressive development of immunity of the vaccinated index (initial) household case, forgetting that exposure of that index case to SARS-

COV-2 will also be varying over time as disease prevalence within the general population changes. Ideally PHE would have used weekly estimates of disease prevalence as a covariate to absorb this source of variation but failed to do so, this being an extraordinary oversight.

The same table provides statistical output for a covariate called Region (a factor variable representing 9 English regions). P-values range from  $p=0.023$  down to  $p<0.001$ , revealing that there are statistically significant differences across regions. Why should this be so? Why should the odds ratio of a household contact becoming a secondary case depend on where they live during an extended period of lockdown? PHE do not address this peculiar finding but they should have because it is further evidence that regional differences may have arisen through regional variation in disease prevalence.

By way of worked example I have derived case detection rate (positive test results per 100 viral tests undertaken) for England using rolling 7-day data to provide a proxy for disease prevalence on a daily basis. The mean case detection rate for the period 4th January 2021 – 28th February 2021 (the period used for non-vaccinated index cases) was estimated at 4.98 cases per 100 tests. In comparison the mean case detection rate for the period 25th January 2021 – 28th February (the period used for vaccinated index cases) was estimated at just 2.60 cases per 100 tests. We thus see that, in terms of national prevalence alone, there was a 47.8% decline in background likelihood of infection across England that PHE have gladly attributed to a 40%-50% saving arising from vaccine immunity. I strongly suspect that using disease prevalence as a covariate in logistic modelling in an appropriate manner will completely change the study outcome.

I am hoping folk are following my argument here and understanding the need for propensity adjustment in studies such as PHE's but there is one other rather technical issue I should mention and that is failure of PHE's analysts to use \*staged\* multivariate logistic regression. What PHE have done is lump all covariates together, including the covariate of interest (Vaccination of Index – a 3 level factor variable indicating vaccination status). In a study such as this it is considered good practice to undertake staged logistic regression whereby demographic and other general covariates are entered into the model at stage 1, with covariates of interest entered at stage 2. This is to ensure all the variability arising within the sample due to age, gender, SEG etc is absorbed within the covariance matrix before the variables of interest are considered. If you want to force an effect when there isn't one then bypassing the gold standard of staged multivariate logistic regression is the way to do it.

If you seriously want to produce an unbiased statistical model for estimating the odds ratio of a household contact becoming a secondary case then a proxy representing propensity of infection (prevalence) would be entered at stage 1, general covariates covering age, gender etc would be entered at stage 2, and then the critical vaccination of index would be entered at stage 3. This approach and only this approach will lead to appropriate results. I cannot believe PHE's statisticians are not aware of this.

Before I brew my tea there is one final consideration – false positives! The validity of PHE's study also rests on the assumption that all PCR test results from all 1,449,427 contacts are going to be correct. If we assume a nominal test sensitivity of 80%, a nominal specificity of 99.9% and the recently declared prevalence of 0.1% then we find PCR testing would have yielded 55.5% false positives i.e. just over half of the data used by PHE are total and utter nonsense. Yet these are nominal estimates; if we assume an operational specificity of 97% then the false positive rate rises to a breathtaking 97.4%, which means PHE's study, in addition to the flaws and weaknesses mentioned, may well have been built on a house of cards.

Now if that sounds bad consider the impact of varying prevalence on false positive rates. In the decline of the outbreak following the late December peak national prevalence would have plummeted and the false positive rate would have rocketed, thus the data would have become more nonsensical as the study progressed. If PHE had any kahunas they would have estimated likely false positive rate during the course of the study and used this as a weighting factor in a propensity-adjusted staged multivariate logistic regression.

Real statisticians do it using weighted, propensity-adjusted, staged multivariate logistic regression – now that's a bumper sticker I must obtain!

## ***Two Slides You Won't See***

One glaring thing that sticks out for me above all other things (and there's a truck load of many glaring things) is that the authorities and organisations producing all these fancy slides for consumption by the public fail to consider the humble rate. We see lots of case counts, lots of admission counts, lots of hospital bed counts, lots of death counts and lots of test counts but nowhere is the humble rate graph to be seen. Public Health England (PHE) manage a feeble cases per 100k population by age band and by region forgetting that this means nothing until we adjust for different numbers of tests within each age band and region. This is akin to buying a 1kg bag of carrots and putting it in the dining room, then buying a 5kg bag of carrots and putting it in the kitchen then declaring the kitchen has more carrots and is thus a tastier place. In the following two slides I am going to buy the same amount of carrots on a day-by-day basis so we may actually see what has been happening over time despite varying levels of test activity.

In the first slide we get to see what I am calling the case detection rate, being positive 'cases' per 100 people tested. That monster early peak of April 2020 sure gives some perspective to the so-called "second wave" and represents a time when we decided to test people who were

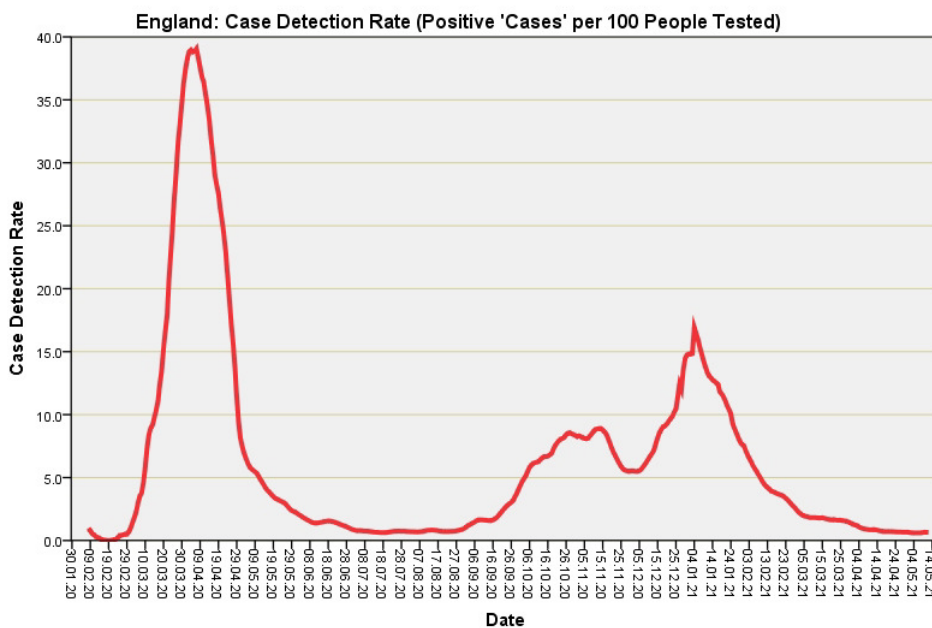
actually sick rather than attending college. The second wave now peaks at just 15 – 20 positive cases per 100 but we must remember that this will include all those false positives.

If we assume a nominal test sensitivity of 80%, a nominal specificity of 99.9% and the recently declared prevalence of 0.1% then we find PCR testing would have yielded 55.5% false positives i.e. just over half of the data are utter nonsense. Yet these are nominal estimates; if we assume an operational specificity of 97% then the false positive rate rises to a breathtaking 97.4%, which means most of what we are seeing is an illusion; even more so when we realise that positive test results can be made to come and go simply by choosing a different cycle threshold. In this regard we may note no laboratory publishes a weekly SOP so we may see what they are doing, and no authority publishes historic cycle threshold data even though they're sitting on piles of this.

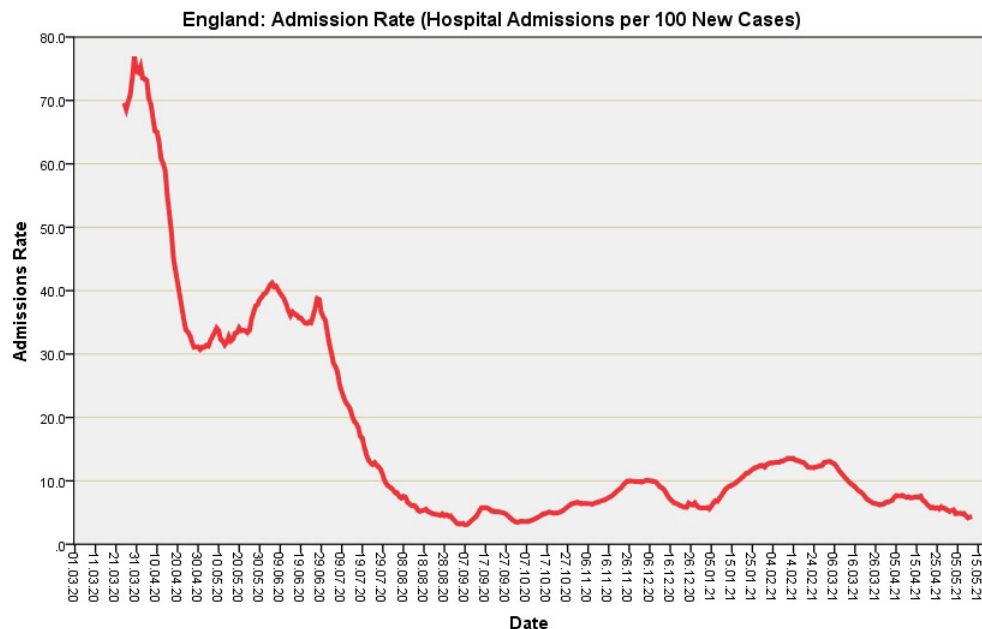
In the second slide I do my carrot trick on hospital admission rate (admissions per 100 new cases). To most folk the word 'admission' will mean the number of folk sick with COVID going to hospital for treatment for COVID but this is not what the word admissions means in GOVSPEAK. In GOVSPEAK admission may be for any reason whatsoever – so long as the admitting patient tests positive then they'll count as a COVID case. Testing positive does not mean they are sick with COVID or carrying any virus (false positive). An admission need not lead to a bed stay, whether day bed or overnight bed and can be self-admission.

An admission need not be to a unit that even treats COVID! Thus, a rather healthy pregnant woman being admitted to a gynaecology unit to give birth to a healthy bouncing baby will be counted as a COVID admission if she happens to receive one of the many false positive test results. The same goes for hip replacements, those needing dialysis, the many with cancer or heart conditions and whipper-snappers coming a cropper in road accidents. If we could set aside the thousands of false positive test results it would be pretty much business as usual, with seasonal respiratory conditions doing the seasonal thing.

Caveats aside we now see a rather serious looking disease outbreak back in March – June of last year, the likes of which we have not seen again. I would argue that the grumbling rate of around 10 admissions per 100 new cases from July 2020 onward is just background noise, being folk going to hospital clutching yet another false positive test result. Neither do we see any evidence of that highly political "second wave" in terms of admissions. In my book a second wave of something that doesn't impact on health service provision isn't really a wave. A wave of fear mongering maybe but not a wave of ill health.



Source: <https://coronavirus.data.gov.uk/>



Source: <https://coronavirus.data.gov.uk/>

## Impact of vaccination on household transmission of SARS-COV-2 in England – Bombshell!

My professional response to this significant report is now contained in two lengthy posts and I'm hoping folk here are beginning to see the absurd assumption that underpins the study along with the poor methodology adopted. In jest I joked about a bumper sticker "Real statisticians do it using weighted, propensity-adjusted, staged multivariate logistic regression" and was planning on firing-off a FOI request to obtain the data so I could undertake the gold standard statistical work myself when I saw this depressing statement on page 24...

### Data Availability Statement

*The data underlying this article cannot be shared publicly due to the legal and policy controls placed on data used as part of the government's response to the Covid19 pandemic.*

...after some thought and a decent lunch I realised I didn't need their precious source data – all I had to do was take the odds ratio information provided in figure 2 of PHE's report and subject this to propensity adjustment myself using my newly derived case detection rate series that I presented in my post entitled Two Slides You Won't See. It's taken a while to accurately re-create PHE's figure 2 but I have now done so and present this as the first slide. Please note that I've flipped the x-axis left-right to match how we are used to seeing time move from the origin and not toward the origin as per PHE's original slide.

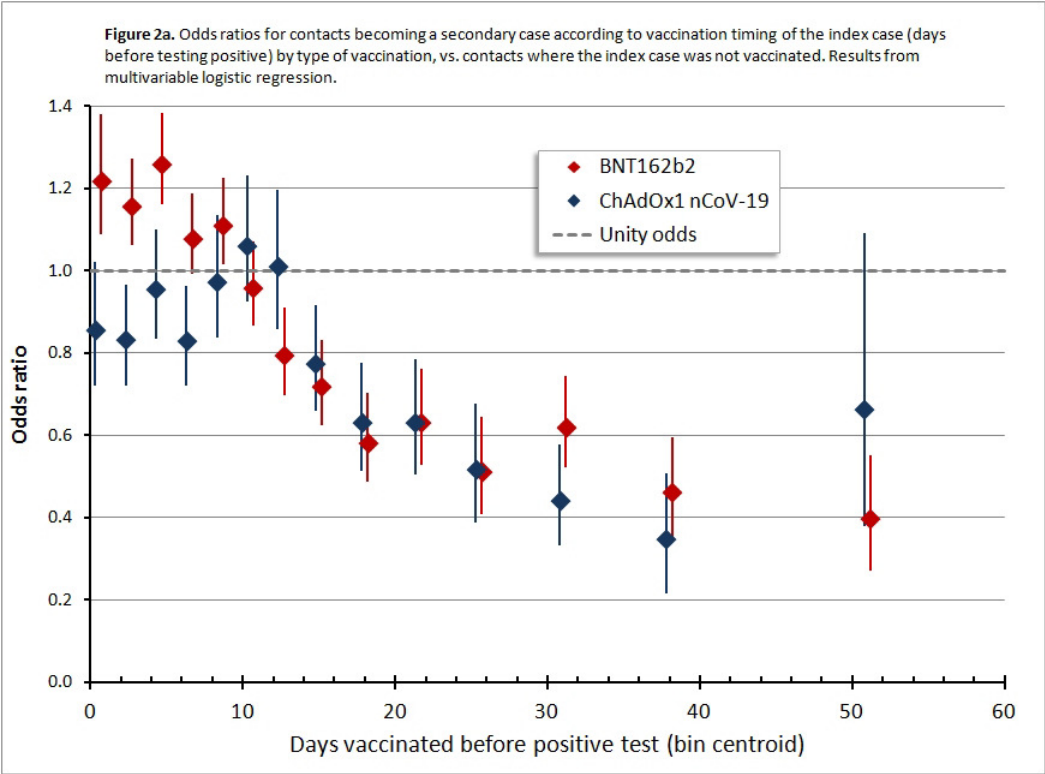
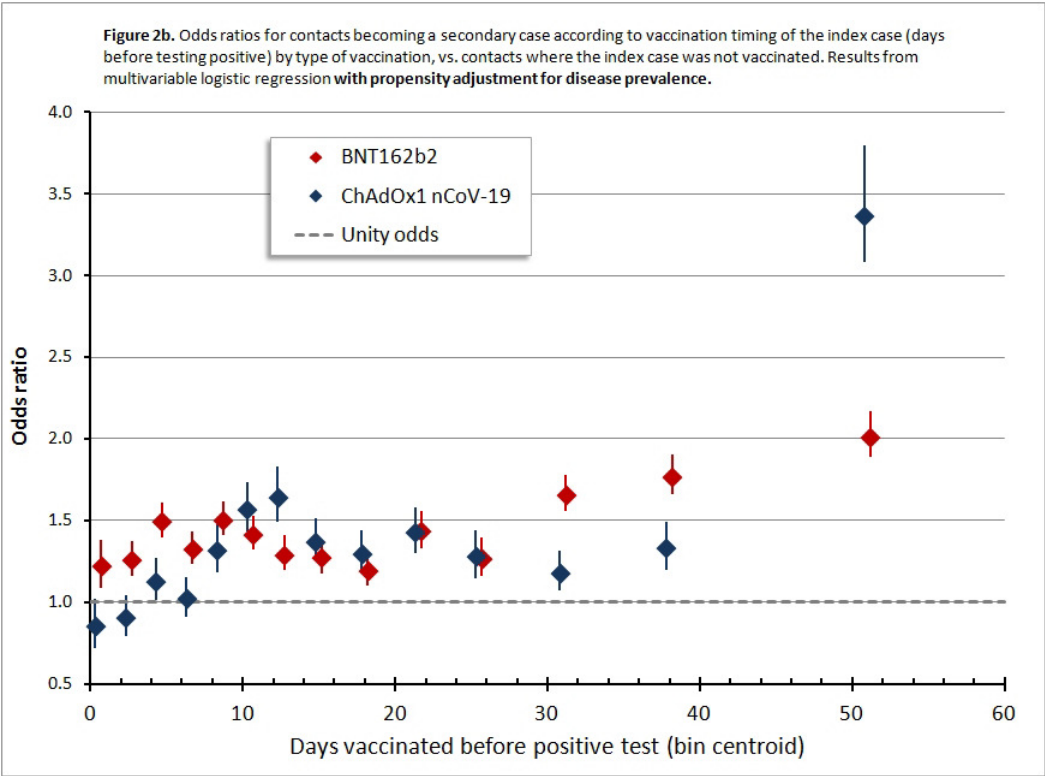
This is the key slide of PHE's report and we see an apparent decrease in the odds ratio over time that PHE attribute to the benefits of vaccination through building immunity. If you are not used to odds ratios simply think of them as a factor such that a value of 1.0 means no change, 0.5 means halving of risk and 2.0 means doubling of risk. Halving and doubling of risk refers to the likelihood of other household members testing positive if the index member of the household (the person being tracked) gets vaccinated.

Right after vaccination we see odds ratios for both vaccines hovering about the unity value of 1.0 meaning vaccination had no initial impact, but over time we see the odds ratios fall below 1.0 which reveals it was less and less likely that secondary household members tested positive. This sure looks convincing but it's a pile of junk for several reasons, the chief reason being the analysts at PHE forgot to use variation in background disease prevalence as a covariate in logistic regression modelling by way of propensity adjustment.

At the start of PHE's study disease prevalence across England was running at an estimated 9.28 positive cases per 100 people tested. By the end of the study at day 60 this had dropped to just 1.83 cases per 100 people tested (these necessarily include false positives). We may expect this variation to find its way into the study since disease prevalence will ultimately determine the exposure of household members to SARS-COV-2 no matter what they were up to.

If we take the odds ratios PHE churned out in the first slide (figure 2a) and adjust them to account for background disease prevalence we arrive at the second slide. This is a veritable bombshell of a result for we now see the odds ratios climbing like crazy. This is only possible if vaccinated index members are transmitting some aspect of SARS-COV-2 to secondary (un-vaccinated) members. Incredibly, members of households where somebody got jabbed with Pfizer's BNT162b2 product are twice as likely to test positive at the 42 – 60 day mark, with AstraZeneca's ChAdOx1 nCoV-19 concoction more than three times more likely to pass something unpleasant to others.

It is more than a little ironic that PHE's very own flagship study of 552,984 households reveals vaccines to be rather dangerous and ill-understood products if we take the trouble to apply appropriate and rigorous statistical methodology. No wonder they don't want to release the data. The stable door is open, the milk spilled and Schrödinger's cat is meowing. The biggest study in the land has just shot itself in the foot, dropped a clanger and stabbed big pharma in the back – all swords come double-edged.





## ***Impact of vaccination on household transmission of SARS-COV-2 in England – an overpowered clinical study***

This is one of those reports that keeps repeating on me like too many gherkins. This morning I realised there is another major flaw with their analysis and this is to do with sample size and test power. The final cohort settled at 1,018,842 secondary cases which is a rather big number. So big, in fact, that statistical analysis of any kind is going to declare all manner of minute difference that do not necessarily exist or have meaning in real life, with p-values going off the scale beyond  $p < 0.001$  due to the colossal statistical power of a sample that is a million strong.

To illustrate this I have synthesised two data series representing the height of male adults, the first series (group A) having a mean height of 180.000 cm with a standard deviation of 0.1cm, the second series (group B) having a mean height of 180.001cm with a standard deviation of 0.1cm.

If I take a random sample of just 100 males (50 from group A, 50 from group B) then a classic stats test (analysis of variance - ANOVA) tells me there is no statistically significant height difference between the two groups ( $p = 0.907$ ). If I take a random sample of 1,000 males (500 from group A, 500 from group B) then ANOVA tells me there is no statistically significant height difference between the two groups ( $p = 0.694$ ). Even if I take a somewhat healthy random sample of 10,000 males (5,000 from group A, 5,000 from group B) then ANOVA tells me there is still no statistically significant height difference between the two groups ( $p = 0.522$ ).

However, If I splash out the dosh on my clinical study and go for a sizeable random sample of 100,000 adult males I suddenly and rather magically obtain a statistically significant difference in height between the two groups ( $p = 0.016$ ).

If I now go extreme PHE-level and obtain a sample of 1,000,000 adult males the significance goes through the roof ( $p < 0.000000000001$ ). That utterly crazy p-value is a classic symptom of an overpowered clinical study in which we can detect any difference we want regardless of whether it has clinical value.

If we leave planet PHE and come back down to Earth for a moment we ought to ponder the issue of whether a difference of 0.001cm in adult male height has any meaning, this representing one hundredth of a millimetre – is there a real difference worth bothering about or have we immersed ourselves in statistical illusion brought about by over-sampling?

As it with continuous measures like height and age, so it is with discrete measures like positive test result, region, week, deprivation band and so on. Every variable - and I mean every variable in PHE's study - will be subject to the same statistical whimsy when samples of 1,018,842 are drawn from the population, yet I see no attempt by PHE analysts to draw attention to this major study weakness. If we turn to supplementary material S1 on pages 25 - 27 of the report we see a list of 46 p-values for various factor levels. Of these no less than 42 (91.3%) indicate  $p < 0.001$ , which is a classic sign of a massively overpowered study.

For the statistically-minded out there I'll just point out PHE fail to provide basic model performance data such as pre and post fit classification tables, Hosmer & Lemeshow test summary, omnibus tests of model coefficients, -2log likelihood, Cox & Snell R-square and Nagelkerke R-square, so we have no idea if the model they fitted to the data is if any value in the very first instance. All those many log odds coefficients they report may be derived from a very poor performing model that does no better than tossing a coin. In this regard we should note you can get statistically significant covariates cropping up in a logistic model that is completely useless at predicting outcomes for the dependent variable of interest. On this rather important technical issue PHE's report is ominously silent.

To wrap up I attach a link to a paper by way of introduction to this tricky subject; we may like to consider the author's sobering conclusion...

Also very low p-values like  $p < 0.0001$  will be rarely encountered, because it would mean that the trial was overpowered and should have had a smaller sample size. It would seem appropriate, therefore, to require investigators to explain such results and to consider rejecting the research involved.

<https://pubmed.ncbi.nlm.nih.gov/15080563/>

## ***Impact of vaccination on household transmission of SARS-COV-2 in England – propensity adjusted for prevalence & false positive reporting***

Yesterday I produced two rather revealing slides, these being the original figure 2 of this significant report from PHE (reproduced rather cheekily as figure 2a) and the same slide but propensity adjusted for disease prevalence within the population that changed dramatically over

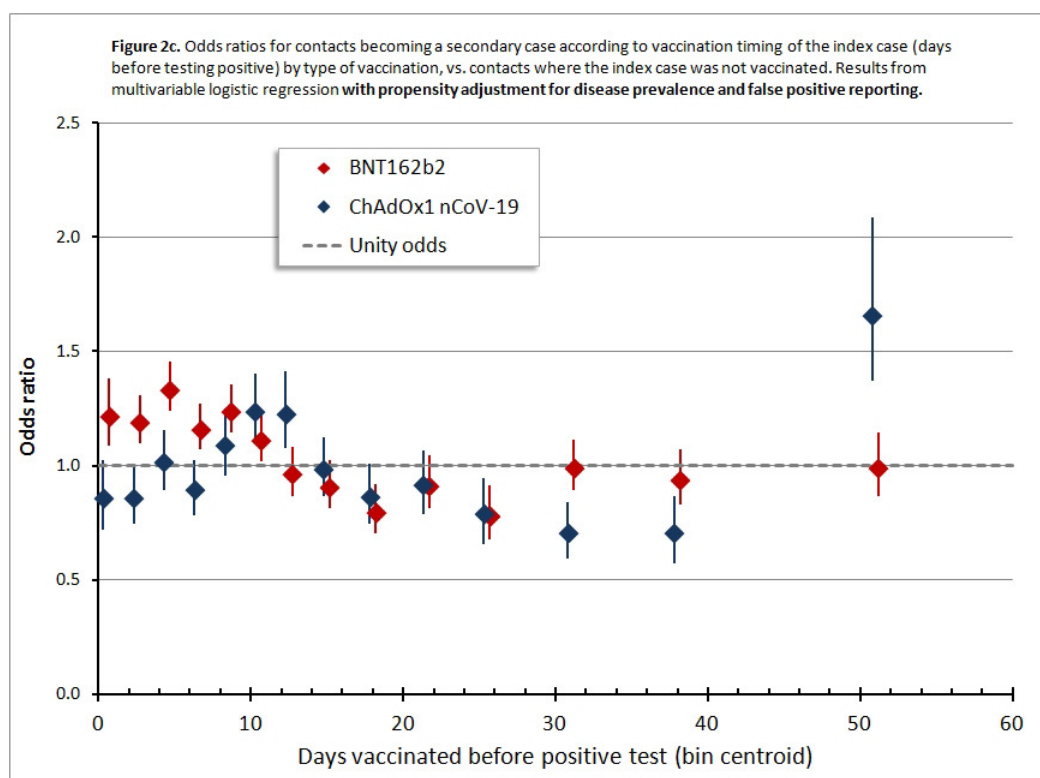
the period of study (a factor that PHE analysts somehow overlooked). The issues with this gherkin of a report don't stop there for we also must realise that, as disease prevalence changes so does the false positive result rate.

What I've done this morning is to use my estimates of prevalence (as derived from the daily series of positive cases detected per 100 people tested) and used this to calculate the daily false positive reporting rate of a PCR test set at a likely real-world-working-lab value of 95% specificity. This rate was then converted to a scaling factor that was combined with the scaling factor for disease prevalence to arrive at a joint factor that offers propensity adjustment for both prevalence and test reliability – something PHE should have done if they were being serious!

I now present figure 2c in the series that reveals odds ratios bobbing along around the unity ratio of 1.0. *This means the two biological products studied are generally neither conferring benefits in terms of reduced transmission nor are they elevating the risk of other household members testing positive through shedding whatever it is they are shedding as many folk fear.* Pfizer's BNT162b2 product does a darn good job of doing nothing for as far as the study stretches (60 days) and AstraZeneca's ChAdOx1 nCoV-19 product bizarrely seems to confer benefits at the 30 – 40 day mark that somehow finally reverse!

I've no idea how many indexed cases were vaccinated with ChAdOx1 nCoV-19 in the final weekly period of 22 Feb – 28 Feb but the sample total for both vaccines was 2,606, which should have been plenty to determine the odds ratio with sufficient accuracy. That final blue point sitting up at an odds ratio of 1.66 sits well clear of unity with no hint of the 95% confidence interval coming close to a value of 1.0.

I must conclude that, unlike Pfizer's mRNA product, AstraZeneca's adenovirus vector product is possibly shedding something beyond day 40 that is being transmitted to other household members sufficient to trigger a positive PCR test. Whether or not this has any clinical implication I cannot be sure but one thing is for certain and that is the AZ jab is generating a circular paradigm.



24<sup>th</sup> May 2021

### ***PHE Household Study Design Bias***

I've now spent a fair few hours and written 3,672 words on the absurdities, flaws, omissions and errors in this study by Public Health England. This morning I wanted to focus on just one aspect and make this as clear as possible, this being failure of PHE's analysts to account for variation in disease prevalence within the population as a whole. This one omission renders the entire study useless.

I shall start with a simple graph showing the decline in disease prevalence for England over the study period of 4<sup>th</sup> January 2021 – 14<sup>th</sup> March 2021 using official data obtained from the UK GOV coronavirus dashboard. Superimposed are the two sampling periods for unvaccinated and vaccinated index cases. PHE allowed a 21-day window for the development of immunity in vaccinated people which means the sampling frame for these cases started 25<sup>th</sup> January 2021 and not 4<sup>th</sup> January 2021 as with the unvaccinated index cases. It should be abundantly clear that

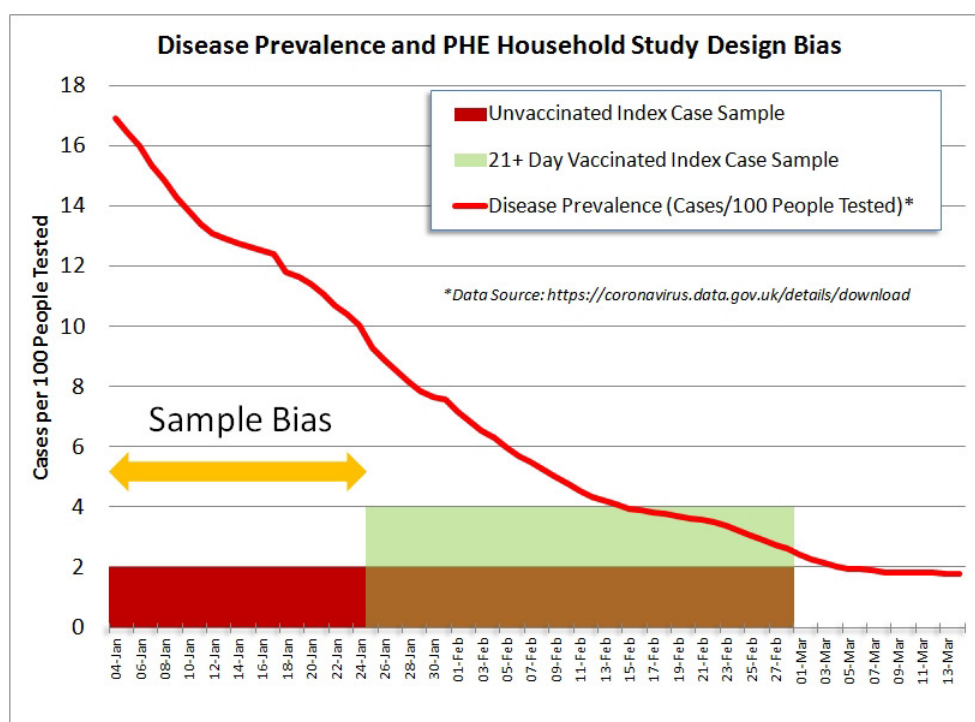
vaccinated index case data covers a later period with a lower rate of disease prevalence. We should not be surprised, therefore, to discover fewer positive cases among secondary household members during this period. This time difference in the sample frame is a significant source of study bias.

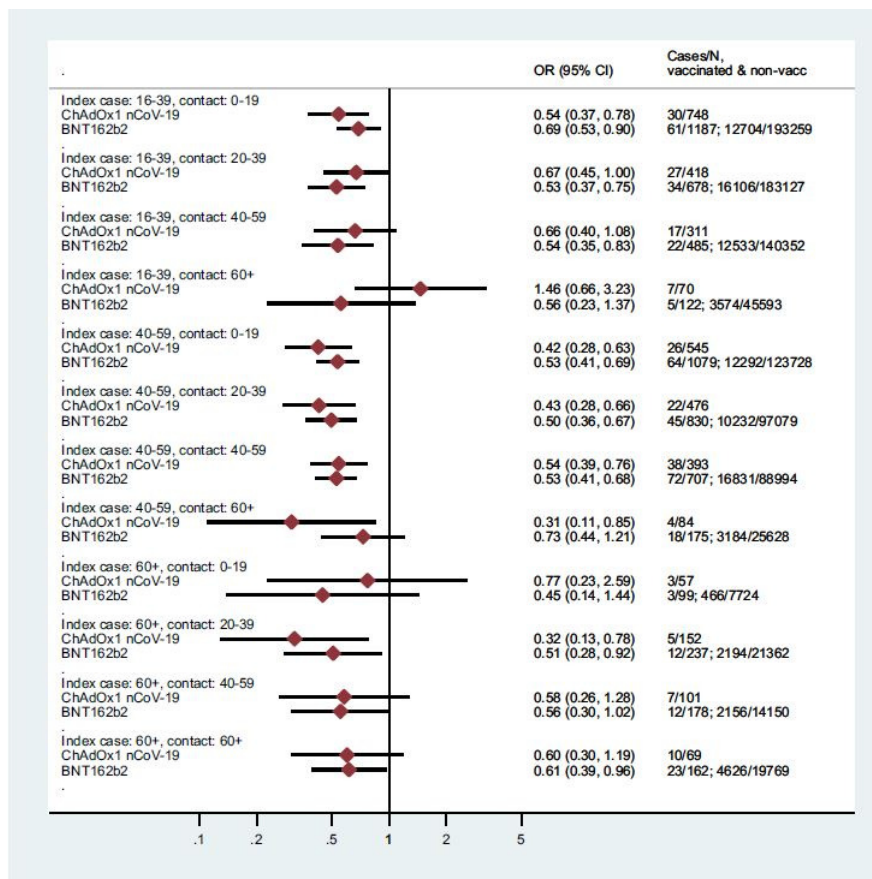
PHE usefully provides positive case counts and sample sizes for vaccinated and unvaccinated cases in figure 1 of their report and this is presented as the second slide. I have taken the data for the two COVID biological products and combined this to produce the table you see in the third slide. To the right of the main table I've derived infection rates for secondary household members of both vaccinated and unvaccinated index cases by age band, with provision of grand totals and rates. The bottom line figures are 0.585% for vaccinated index cases and 0.975% for unvaccinated index cases, these giving us an unweighted grand odds ratio of 0.60. This estimate compares favourably with the multivariable modelled odds ratios of 0.52 (ChAdOx1 nCoV-19) and 0.54 (BNT162b2) presented in supplementary material S1 of the report. Without further thought we may take this as evidence of vaccines reducing household transmission but we'd be quite wrong to do so since we haven't taken account of the inherent design bias.

In table 2 of their report (characteristics of household contacts according to vaccination status of index case) PHE usefully provide counts of secondary household cases for each of the eight weeks starting 4<sup>th</sup> January 2021. This enabled me to derive mean weekly estimates of disease prevalence, which started at 15.38 cases per 100 people tested during w/b 4<sup>th</sup> January 2021 (15.38%), and ended at 3.05 cases per 100 people tested during w/b 22<sup>nd</sup> February 2021 (3.05%). It was then a simple matter to derive overall weighted estimates of prevalence for the vaccinated and unvaccinated index data series, these fetching-up at 4.26% and 11.22% respectively (see slide 3).

When applied as factor weightings to adjust for the study design bias something remarkable happens – we find the infection rate for vaccinated index cases soaring to 1.540% compared to the 0.975% for unvaccinated cases, this equating to a weighted grand odds ratio of 1.58. The primary study result has thus been stood on its head and we find evidence of vaccinated individuals increasing the likelihood of SARS-COV-2 infection of other household members by 58%.

PHE could easily correct this extraordinary statistical oversight either by using disease prevalence as a covariate in multivariable logistic regression modelling or by selecting unvaccinated index case records from 25<sup>th</sup> January onward such that the sampling time frame matches. The former method is preferred since variation in weekly sample sizes still has the potential to bias the results; it would also offer an opportunity to adjust for regional variation in prevalence. Until this is done the study is as useful as finding a turd in your slipper.





**Combined COVID products (Source: Figure 1, page 12)**

| Index Age Band                         | Contact Age Band | Positive Cases | N     | Vaccinated Records | Unvaccinated Records | Secondary Case Infection Rate - Vaccinated | Secondary Case Infection Rate - Unvaccinated |
|----------------------------------------|------------------|----------------|-------|--------------------|----------------------|--------------------------------------------|----------------------------------------------|
| 16-39                                  | 0-19             | 91             | 1,935 | 12,704             | 193,259              | 0.716%                                     | 1.001%                                       |
| 16-39                                  | 20-39            | 61             | 1,096 | 16,106             | 183,127              | 0.379%                                     | 0.598%                                       |
| 16-39                                  | 40-59            | 39             | 796   | 12,533             | 140,352              | 0.311%                                     | 0.567%                                       |
| 16-39                                  | 60+              | 12             | 192   | 3,574              | 45,593               | 0.336%                                     | 0.421%                                       |
| 40-59                                  | 0-19             | 90             | 1,624 | 12,292             | 123,728              | 0.732%                                     | 1.313%                                       |
| 40-59                                  | 20-39            | 67             | 1,306 | 10,232             | 97,079               | 0.655%                                     | 1.345%                                       |
| 40-59                                  | 40-59            | 110            | 1,100 | 16,831             | 88,994               | 0.654%                                     | 1.236%                                       |
| 40-59                                  | 60+              | 22             | 259   | 3,184              | 25,628               | 0.691%                                     | 1.011%                                       |
| 60+                                    | 0-19             | 6              | 156   | 466                | 7,724                | 1.288%                                     | 2.020%                                       |
| 60+                                    | 20-39            | 17             | 389   | 2,194              | 21,362               | 0.775%                                     | 1.821%                                       |
| 60+                                    | 40-59            | 19             | 279   | 2,156              | 14,150               | 0.881%                                     | 1.972%                                       |
| 60+                                    | 60+              | 33             | 231   | 4,626              | 19,769               | 0.713%                                     | 1.168%                                       |
| Total Records                          |                  | 567            | 9,363 | 96,898             | 960,765              | 0.585%                                     | 0.975%                                       |
| Unweighted Grand Odds Ratio            |                  |                |       |                    |                      | 0.60                                       |                                              |
| Mean Daily Prevalence for study period |                  |                |       |                    |                      | 4.26%                                      | 11.22%                                       |
| Factor                                 |                  |                |       |                    |                      | 2.631                                      | 1.000                                        |
| Adjusted infection rate                |                  |                |       |                    |                      | 1.540%                                     | 0.975%                                       |
| Weighted Grand Odds Ratio              |                  |                |       |                    |                      | 1.58                                       |                                              |

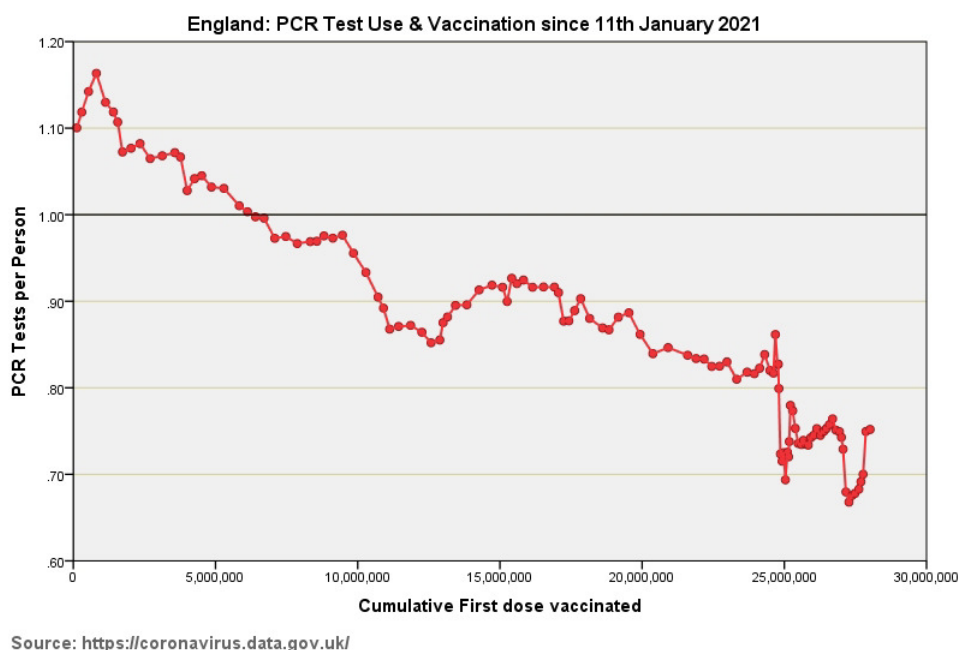
26<sup>th</sup> May 2021

## PCR Test Bias & Vaccination

In preparing data for statistical modelling of the impact of vaccination on infection rates, admission rates and death rates I've come across a fly buzzing in the proverbial ointment. This is best explained by pulling up the attached slide, which reveals a distinct tendency to conduct less RT-PCR tests per person as the vaccination programme rolls along. Since PCR is currently the go to test for verification of SARS-COV-2 (positive

lateral flow test results are verified using PCR) then less testing will mean decreased likelihood of detection. In stats speak we call this sample bias, and there's plenty of it!

In crude terms this slide reveals that the authorities have reduced likelihood of SARS-COV-2 detection by around 36% over a space of 17 weeks by deciding to test less. If nothing else this will be felt as a 36% reduction in new cases, which is most convenient for those spinning the narrative. Test less, get less and applaud the wonder of modern science – it couldn't be simpler!



## ***Disease Prevalence & Vaccination***

Over the next few posts I'm going to tackle a very big area and that is analysis of the benefits of vaccine rollout across England. This is necessarily going to be a brain mangler requiring lots of fancy statistical techniques so I'll keep it as sweet and short as possible.

First up is the meaty question is vaccination rollout lowering disease prevalence within the population? The answer is a big fat YES if you fail to undertake appropriate analyses and an enormous NO if you actually bother to do it right. We'll start with the first slide that sure looks like it is telling us YES!

Here we see a measure of national disease prevalence for England (positive cases per 100 people tested, as derived from 7-day rolling case totals) plotted against cumulative figures for the 1st dose rollout. The notion here is that rollout is going to reduce disease prevalence, so the more we jab folk, the lower disease prevalence becomes. This is exactly what we see but what we see is deceptive. What we haven't done, for one thing, is taken account of the bias introduced by testing folk less, as discussed in my previous post entitled 'PCR Test Bias & Vaccination'.

If we test folk less using PCR then we are less likely to detect SARS-COV-2 within the population, which means cases are going to decline anyway. The BIG question is whether this inclination to test less over time explains the reduction in disease prevalence we see in this first slide or whether there are benefits of vaccination despite this.

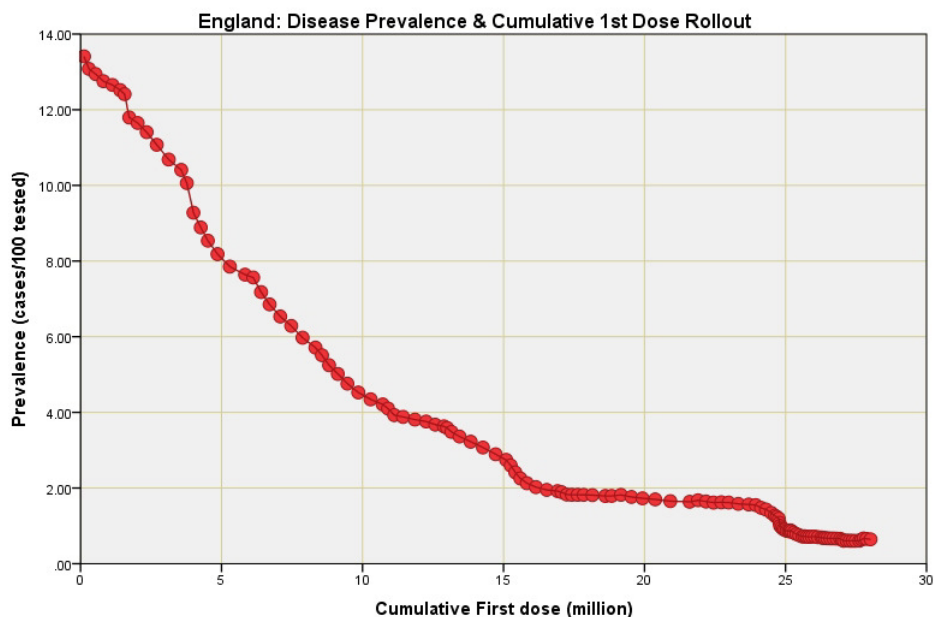
To answer this question we must turn to multivariable statistical modelling, and the powerful technique I have used is Generalised Linear Modelling (GLIM). We start by confirming the negative relationship of this first slide and then we run GLIM again but incorporating a variable that accounts for test use (rolling 7-day PCR tests per person). I provide the printout from my stats package for these two stages but all I want you to do is look at the number in the green box and the number in the pink box.

The number in the green box (-0.282) tells us that for every million first doses of vaccine disease prevalence drops, on average, by 0.282% ( $p < 0.001$ ). That's a splendid benefit! Except it is an illusory benefit because we haven't accounted for the bias introduced by testing people less with PCR. In the lower table I have done just this, and we find that rolling 7-day PCR tests per person is highly statistically significant ( $p < 0.001$ ), along with an interaction term ( $p < 0.001$ ) i.e. testing people less is having a tremendous impact on the national results. Let us now look at the number in the pink box (0.690) – this tells us that for every million first doses of vaccine disease prevalence increases, on average, by 0.690% ( $p < 0.001$ ) once we account for changes in the national test regime. Though the wrinkle here is an interaction between PCR tests per person and cumulative first dose, which complicates matters somewhat



Though there's a lot more modelling work still to be done here is the first empirical evidence that vaccination rollout is increasing disease prevalence across England. This astonishing fact is being disguised because we're using PCR less and less frequently, and so the chances of detecting any virus are lessening.

At this stage it would appear the vaccines are spreading the virus rather than constraining it, though to be accurate we need to say vaccines are increasing the chances of a positive test result (whatever that means).



Source: <https://coronavirus.data.gov.uk/> Data Period: 11th January - 12th May

| Parameter Estimates             |                   |            |                              |        |                 |         |
|---------------------------------|-------------------|------------|------------------------------|--------|-----------------|---------|
| Parameter                       | B                 | Std. Error | 95% Wald Confidence Interval |        | Hypothesis Test |         |
|                                 |                   |            | Lower                        | Upper  | Wald Chi-Square | df Sig. |
| (Intercept)                     | 8.199             | 0.2865     | 7.637                        | 8.761  | 818.813         | 1 0.000 |
| Cumulative First dose (million) | -0.282            | 0.0111     | -0.304                       | -0.260 | 643.287         | 1 0.000 |
| (Scale)                         | .181 <sup>a</sup> | 0.0226     | 0.142                        | 0.231  |                 |         |

Dependent Variable: Rolling 7-day Positive cases per 100 people tested  
Model: (Intercept), Cumulative First dose (million)

a. Maximum likelihood estimate.

| Parameter Estimates                                                  |                   |            |                              |         |                 |         |
|----------------------------------------------------------------------|-------------------|------------|------------------------------|---------|-----------------|---------|
| Parameter                                                            | B                 | Std. Error | 95% Wald Confidence Interval |         | Hypothesis Test |         |
|                                                                      |                   |            | Lower                        | Upper   | Wald Chi-Square | df Sig. |
| (Intercept)                                                          | -18.072           | 1.6110     | -21.229                      | -14.914 | 125.836         | 1 0.000 |
| Cumulative First dose (million)                                      | 0.690             | 0.0545     | 0.583                        | 0.796   | 160.230         | 1 0.000 |
| Rolling 7-day PCR tests per person                                   | 27.027            | 1.6524     | 23.789                       | 30.266  | 267.534         | 1 0.000 |
| Rolling 7-day PCR tests per person * Cumulative First dose (million) | -0.993            | 0.0562     | -1.103                       | -0.883  | 311.609         | 1 0.000 |
| (Scale)                                                              | .044 <sup>a</sup> | 0.0056     | 0.034                        | 0.056   |                 |         |

Dependent Variable: Rolling 7-day Positive cases per 100 people tested  
Model: (Intercept), Cumulative First dose (million), Rolling 7-day PCR tests per person, Rolling 7-day PCR tests per person \* Cumulative First dose (million)

a. Maximum likelihood estimate.



## Clarification of Test Rate Issue

A fair few people are getting brain ache over recent analyses, with all this use of Z-scores, adjustments and statistical fiddling so I thought I'd try a fresh and easy approach so we may all understand what I am doing and why.

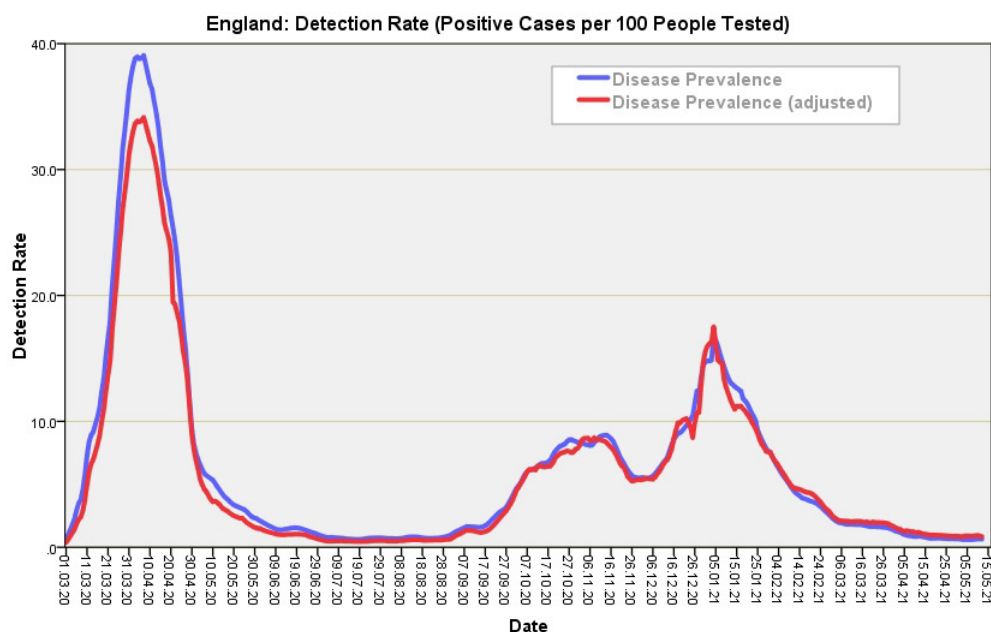
If we could have responded to the pandemic as we would approach a clinical trial we'd have set definitions and protocols at the outset. Since all of our so-called 'cases' are positive test results then the testing regime should have been standardised first and foremost, with the cycle threshold set at Ct<28 and kept at Ct<28.

We would have adopted a single, standardised national test and calibrated sensitivity and specificity under real world (working lab) conditions, with quality reports issued daily. Aside from clinical need we would have also tested the same proportion the population on a random basis each and every day, and we would have conducted exactly the same number of tests on each person subject to testing. We did none of this and so we have a terrible mess that is near impossible to sort out.

If we take this last standard – number of tests on each person subject to testing – it should be clear that taking 5 tests is going to increase the chances of getting a positive result compared to just 1 test. These increased chances, when summed over the nation, is going to impact on the number of cases we report. We may thus ask what the national disease prevalence profile for England would look like if we had always stuck to the same number of tests per person – would it be any different to what we observe?

The good news is we can calculate what the national profile would have theoretically looked like by using PCR tests per person as a factor weighting. We may think of this as levelling the playing field. Ideally we have to level the playing field in several ways simultaneously but let us just consider this one aspect for now.

I attach a slide showing what happens to disease prevalence (a.k.a. detection rate) when we adjust for this single factor. By adjustment I mean standardise the test rate at 1 PCR test per person. Though a seemingly irrelevant issue we now see something as trivial as variation in PCR tests per person alter the national disease prevalence profile.



Source: <https://coronavirus.data.gov.uk/>

29<sup>th</sup> May 2021

## Do People Get Tested When Sick?

This is one of those seemingly simple questions that opens up a whole can of worms. Whilst people are obviously being tested when displaying symptoms, many more people are being tested when not displaying symptoms. This is a most peculiar state of affairs and one in which we've somehow turned the concept of healthcare on its head. Everybody is now guilty of carrying a disease until proven innocent, and we prove that innocence using a test that is not fit for purpose. Right now, with a declared disease prevalence of 0.1%, a nominal PCR test sensitivity of 80% and likely real-world operational specificity of 97%, the PCR test is going to be churning out 97.4% false positives. On this basis we keep everyone locked up until vaccination prevails.

I'm surprised at just how many experts continue use the phrase 'asymptomatic case' when all they are talking about is a healthy person who happened to test positive with a test churning out garbage. There are indeed asymptomatic cases in medicine (asymptomatic/NYHA class I dyspnoea status pre surgery being an example of a condition I used to assess) but these are the real McCoy with people being genuinely sick with coronary heart disease with an elevated risk of early death. They weren't people who'd stuck a swab up their nose.

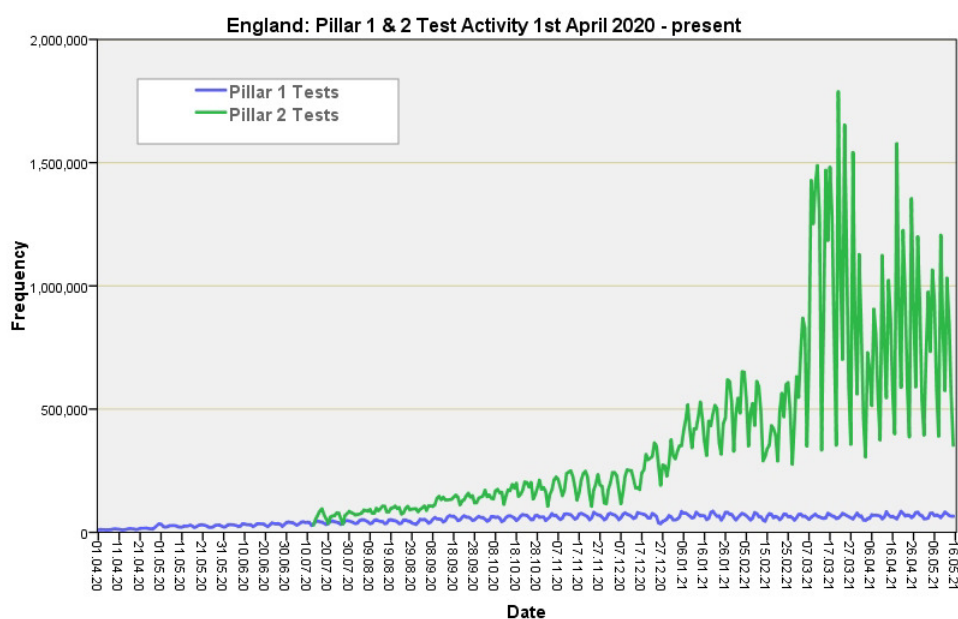
In the UK we have divided our test regime into four pillars. Pillar 1 is testing folk at the sharp end in clinical settings, either because they're symptomatic or because they are working with symptomatic people. Pillar 2 is testing folk in the wider community who may or may not be symptomatic and may or may not have come into contact with a symptomatic case. The emphasis placed on these is best illustrated in the first slide where we see the symptomatic sharp end in blue trundling along, with community testing going wild, especially during recent months. What started out as valuable testing of sick folk and their carers has descended into testing anybody who breathes, whether this has clinical value or not. Right now, we may pretty much assume testing of the UK population is a random affair giving a truck load of false positives, on which we base national policy.

With this in mind I'd now like to throw up a rather colourful slide that reveals the relationship between PCR test rate (PCR tests per person) and disease prevalence (cases per 100 people tested). As discussed in my previous post entitled Clarification of Test Rate Issue, the number of times you decide to test somebody (whether symptomatic or not) is going to affect the number of cases you are going to count (an analogy with the rolling of a die was made). This isn't a problem until you come to analyse historic data, for in doing so you assume standards, definitions and procedures haven't changed over time. Except they have – and significantly so.

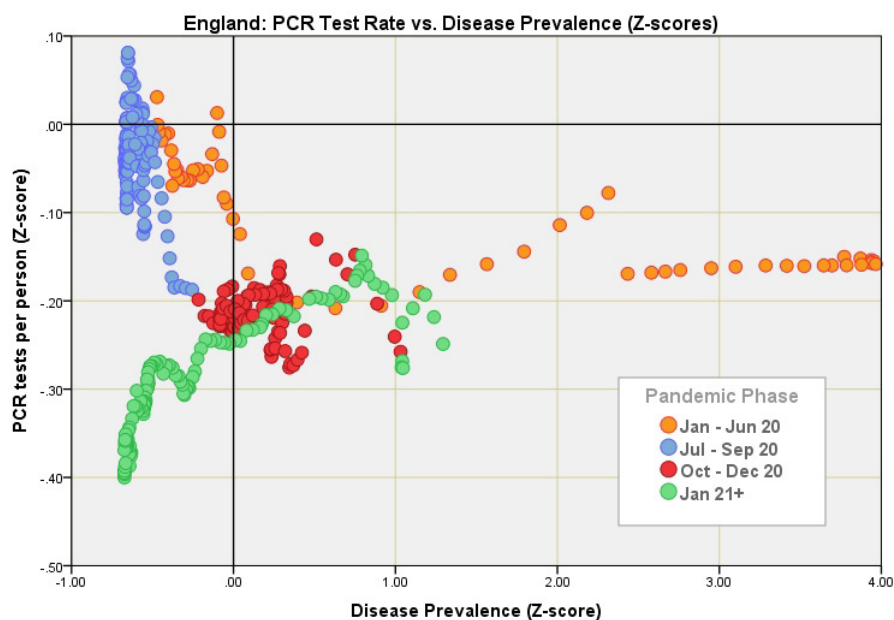
In this second slide these shifting sands are markedly evident. It is noteworthy that the highest levels of disease prevalence were seen in the earliest stages during Jan – Jun 2020 (orange blobs on right), but in the lean summer months of Jul – Sep PCR testing went into hyperdrive despite extraordinary low prevalence. This is the best way I can think of to generate a truck load of false positive results with which to scare people. Another noteworthy finding is that our great and terrible second wave of Oct – Dec, that dwarfed the initial outbreak and wrecked Christmas, yielded rather modest disease prevalence. This brings us on to the most recent months where tests per person have hit rock bottom but disease prevalence is strung out.

The first word that comes into my head when looking at this colourful tangle is 'contrived'. The fact that our eyes can detect distinct clusters, patterns and strings is indicative of systematic policy changes. For example, they clearly decided to do extra tests on people during the summer holidays – the very time of year when risk is lowest. Since December 2020 they're not so keen on being rigorous. I wonder why.

I gather from some of you that facebook fact checkers aren't happy with my analyses revealing hidden test bias, with experts claiming "only sequenced tests are revealing a decline". Well I have news for them – the PCR test is what they are calling a "sequenced test" and my analyses are all about the PCR test and nothing but the PCR test. What kind of experts are they employing these days?



Source: <https://coronavirus.data.gov.uk/>



Source: <https://coronavirus.data.gov.uk/> Data Period: Apr 2020 - present

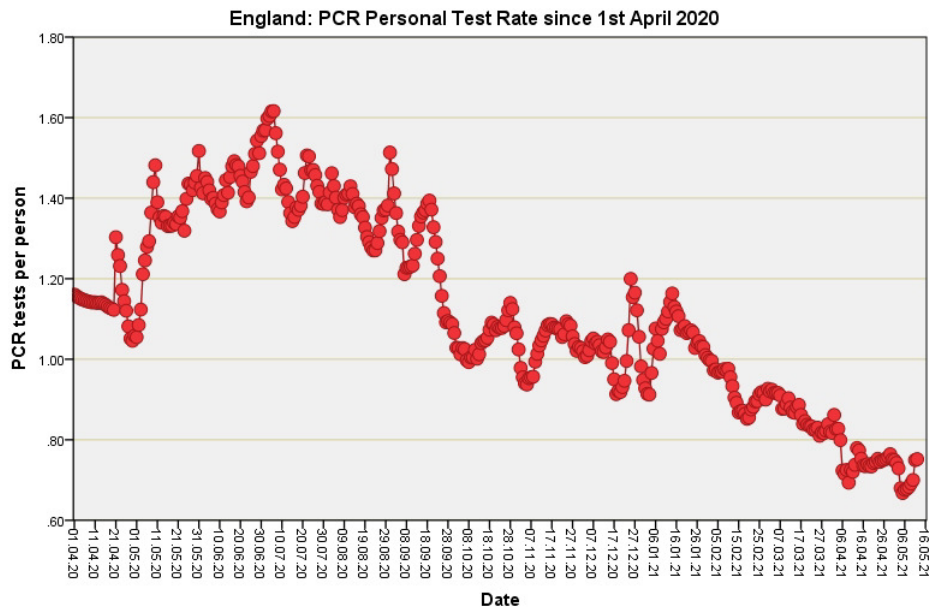
### ***What Bias Is This I See Before Me?***

There are many ways you can make pandemic look worse than it actually is. You can do more testing and get more cases. You can raise the cycle threshold for RT-PCR beyond the limits advised by MIQE guidelines (Minimum Information for Publication of Quantitative Real-Time PCR Experiments) and you can start testing people more often. The latter is a substantial but hidden source of bias that isn't that well known and is what I've been beefing on about in several posts now. I hope the penny has dropped, if it hasn't drop another penny because that is what we are talking about. If we test somebody just once (whether symptomatic or not) we have just once chance of obtaining a positive result (whether true or false positive). If we test them twice we have two chances of obtaining a positive result. Multiply these individual chances up to national level and we can shift the case count like crazy just by leaning slightly toward a more rigorous or more relaxed test policy over time.

With that in mind I attach an expanded series for PCR tests per person showing just how much test rigour has changed since 1<sup>st</sup> April 2020. Bizarrely, we see the greatest test rates occurring during the summer of 2020 at a time when the sun came out, folk ate ice cream in the fresh air and the disease had hit rock bottom. Anybody would think they were trying to create cases to keep the pandemic alive in people's minds – surely not!

Following vaccine rollout commencing 8<sup>th</sup> December 2020 we find test rigour is now scraping an all time low and chances for obtaining a positive result evaporating. Funny that. This all time post-vaccine low isn't a new thing or a magical outcome of vaccine benefit for we can clearly see somebody decided to steadily cool the PCR testing regime way before vaccines came along. Instead of relying on eyeballs I can run a simple intervention analysis using Temporal Causal Modelling (TCM) and ask if the introduction of vaccines on 8<sup>th</sup> December 2020 is associated with a statistically significant reduction in the test rate over the period 1<sup>st</sup> October 2020 – 12<sup>th</sup> May 2021. Computer says no ( $p=0.813$ ).

Facebook fact checkers are going to hate this. They'll respond with some statement that there is a decline in the test rate but only in "tests sent for sequencing". In plain English this means RT-PCR, which is precisely what I've analysed. So wise are the wise ones that they're admitting to what I've just shown; what they are not going to tell you is how this source of bias makes a mockery of the case counts and all the many analyses hanging off these (including some of my own!).



Source: <https://coronavirus.data.gov.uk/> Data Period: 1st April 2020 - 12th May 2021

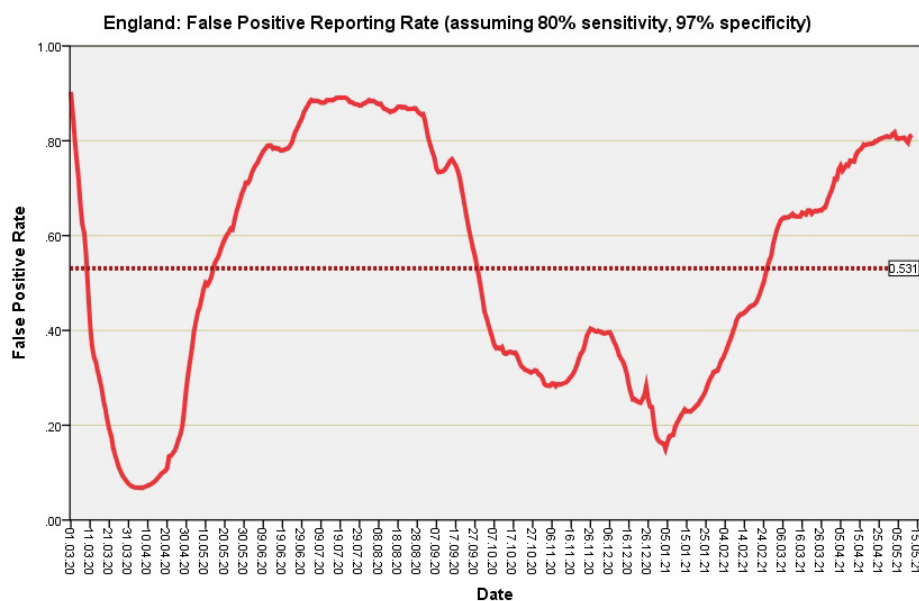
30<sup>th</sup> May 2021

### False Positive Reporting Rate

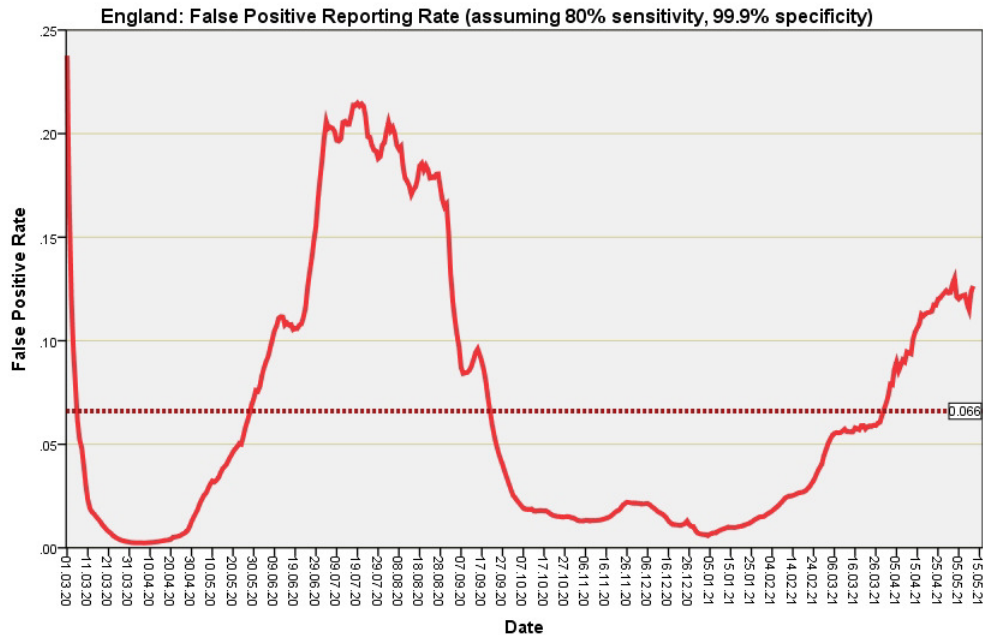
With the data series for disease prevalence across England now adjusted for a standardised testing rate per person over time I can now have a stab at estimating the false positive reporting rate using a nominal test sensitivity of 80% and likely real-world operational specificity of 97% (though some would argue this is being generous). The result is attached and should speak for itself. The mean false positive reporting rate for 1<sup>st</sup> April 2020 – 12<sup>th</sup> Mat 2021 fetches up at 53.1% (red dashed line) and we can see it hitting a whopping great 90% during the summer of 2020.

Some folk are going to grumble at this, claiming the nominal test specificity of PCR is 99.9% is what we should be considering because that's what the experts claim. I'll pay good money to anybody providing evidence that working laboratories in the real world are managing to get anywhere near this largely theoretical figure. Nevertheless, I also attach a slide revealing the curve we may obtain under perfect assay conditions. We now see the series mean of 6.6% false positive, with the 2020 summer peak hitting 20%.

Has anybody in authority made any adjustment for this? I suspect not, so hold on to your hats as I opt for 97% specificity and re-work the data!



Source: <https://coronavirus.data.gov.uk/>



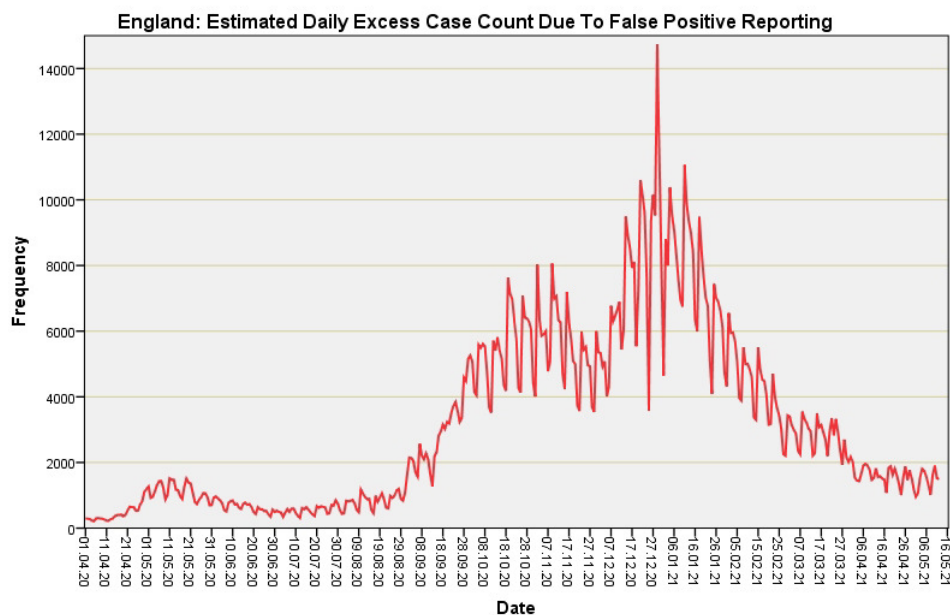
Source: <https://coronavirus.data.gov.uk/>

### ***New Cases (FPR Adjusted)***

With estimates of the false positive reporting rate in the pot (see my post entitled False Positive Reporting Rate) we can now have a stab at adjusting the daily case count data as supplied by the UK government coronavirus dashboard team and see how the raw figures stack up against FPR-adjusted counts. I'm quite pleased with this because the changes are not so dramatic that I'm tugging at my beard but we do see something significant.

The greatest difference between officially declared and FPR-adjusted case data is to be seen in the run up to January 2021 and I attach a second slide showing the estimated daily excess case count due to false positive reporting. We now see an excess of 10,000 false positive test results per day were being declared as 'cases' during the winter of 2020/21.

I have yet to see Public Health England (PHE), the Office for National Statistics (ONS) or the Department of Health and Social Care (DHSC) acknowledge the problem of false positives to the extent that the public fully understands the issue when looking at yet another glossy chart that is more meme than meaning.



Source: <https://coronavirus.data.gov.uk/>

## The Problem In A Nutshell

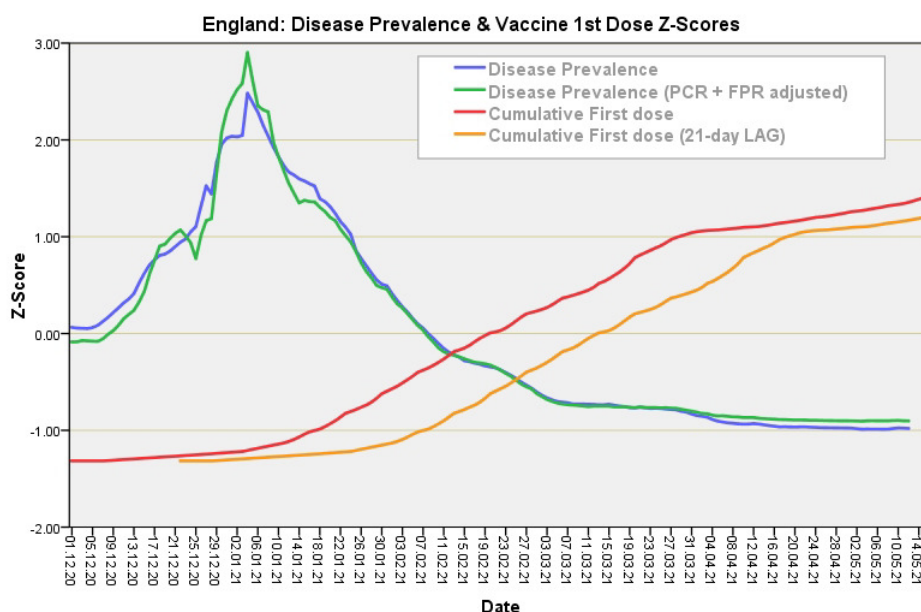
I have baked the attached slide to summarise the problem of assessing the benefit of vaccination on disease prevalence in a rigorous statistical manner. What we are looking at are Z-Score transforms for the period 1<sup>st</sup> December 2020 – 16<sup>th</sup> May 2021 for four key variables. Z-scores enable us to plonk everything on the same graph so we may more easily compare variables and spot patterns as well as likely relationships.

There are two series for disease prevalence these being the unadjusted raw data series derived from official figures (blue line) and the series I have produced after making adjustments for false positive reporting rates and PCR test bias (green line). Those differences may look subtle but they may well have a profound impact in statistical modelling – we shall see whether my efforts at refining the data have been in vain when I turn the handle! We see disease prevalence for England rising to a peak on 4<sup>th</sup> January then tailing off.

That big red line is the 1<sup>st</sup> dose cumulative daily total, which kicked-off on 8<sup>th</sup> December 2020. Data authorities such as Public Health England (PHE) are allowing a 21-day delay within their analyses to allow immunity to build and I shall do the same, this being the series depicted in orange.

Whilst we see a decline in disease prevalence post vaccine rollout (and post the 21-day immunity period) we also see that the decline in prevalence started well before vaccination got going. This initial decline may be due to the spread of infection slowing (building herd immunity), a seasonal aspect to the virus, a seasonal aspect to our bodily physiology, a beneficial effect of lockdown and other policies, and a change in test methodology (lowering of CT threshold in accordance with WHO guidelines issued on 14<sup>th</sup> December), among other things.

The trick here is to account for as many of these confounding factors as possible using a tool built for handling time spaghetti, this being Temporal Causal Modelling (TCM). In the next few posts I'll be revealing what TCM has to say about the relationship between disease prevalence and vaccine rollout as confounding factors are accounted for. We'll get to know if some genuine benefit is accruing or whether we're looking at an illusory correlation brought about by these confounding factors. I've no idea what I'll find, so this is a pretty darn exciting handle-turning moment!



Source: <https://coronavirus.data.gov.uk/> Data Period: 1st Dec 2020 - 16th May 2021

## Vaccination & Disease Prevalence (1<sup>st</sup> Dose)

In my previous post entitled The Problem In A Nutshell I sketched out some of the issues in trying to determine whether the national vaccination program is having a beneficial effect in terms of disease prevalence. On paper there should be absolutely no benefit whatsoever because the spike protein does not modulate the method of transmission, being merely the method by which SARS-COV-2 gains entry into the cell. Despite the inherent logic some argue that there may well be an interplay with viral loading and shedding (though I have yet to see the hard evidence) and so I decided to spend time settling the manner as comprehensively as possible.

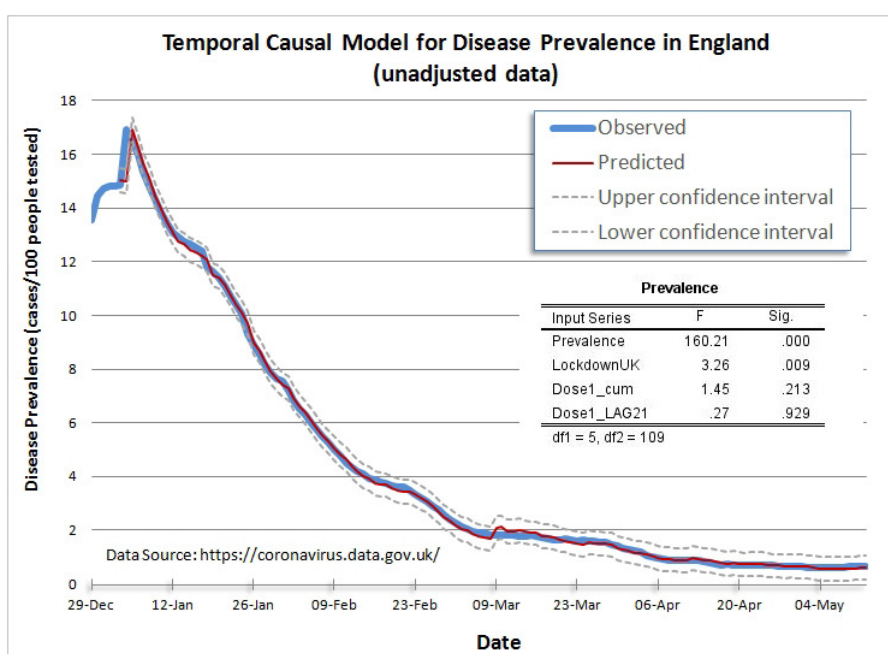


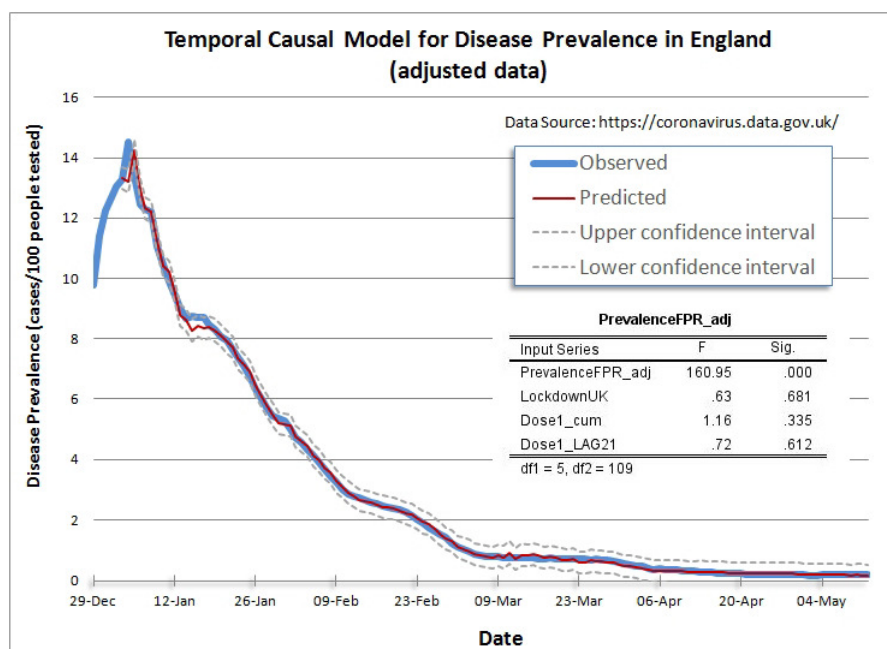
Temporal Causal Modelling (TCM) was used to build predictive models of disease prevalence for the period 29<sup>th</sup> December 2020 – 12<sup>th</sup> May 2021 using cumulative 1<sup>st</sup> dose (Dose1\_cum) and delayed cumulative 1<sup>st</sup> dose (Dose1\_LAG21) independent variables, and a binary indicator variable for lockdown status (LockdownUK). A start date of 29<sup>th</sup> December was chosen to permit the 21-day build up of immunity (the England vaccination campaign started 8<sup>th</sup> December). Two dependent variables were considered, these being disease prevalence derived from unadjusted data (Prevalence) and disease prevalence adjusted for false positive reporting and PCR test bias (PrevalenceFPR\_adj) - please see several earlier posts explaining why such adjustment is important to remove sample bias.

In the first slide we see observed and predicted values along with 95% confidence intervals for a temporal causal model in the prediction of unadjusted disease prevalence across England for the period 29<sup>th</sup> December – 12<sup>th</sup> May 2021. Only one independent variable reached statistical significance and that is the binary indicator for lockdown status ( $p=0.009$ ), which marked the period 6<sup>th</sup> January – 7<sup>th</sup> March. Although this provides some evidence that lockdown has affected disease prevalence as some claim, we should remember this is a model for the unadjusted data and is thus going to contain considerable sample bias. It is noteworthy that neither cumulative 1<sup>st</sup> dose nor 21-day delayed cumulative 1st dose come anywhere close to statistical significance at  $p=0.213$  and  $p=0.929$  respectively.

In the second slide we see observed and predicted values along with 95% confidence intervals for a temporal causal model in the prediction of adjusted disease prevalence across England for the period 29<sup>th</sup> December – 12<sup>th</sup> May 2021. After adjusting for bias introduced by false positive case reporting and variation in test regime rigour (tests per person) we now find there is absolutely no impact of lockdown ( $p=0.681$ ), no impact of cumulative 1<sup>st</sup> dose ( $p=0.335$ ) and no impact of 21-day delayed cumulative 1<sup>st</sup> dose ( $p=0.612$ ).

To my way of thinking this is pretty conclusive hard statistical evidence that the national vaccination program for England has done absolutely nothing to ameliorate disease prevalence. It also reveals the inadequacy of lockdown measures in preventing transmission. There will no doubt be some who will argue that it is only when the second dose is given will the genuine benefit be seen. This is quite easy to put to the test and in the next post I shall reveal the results of temporal causal modelling with 2<sup>nd</sup> dose data.





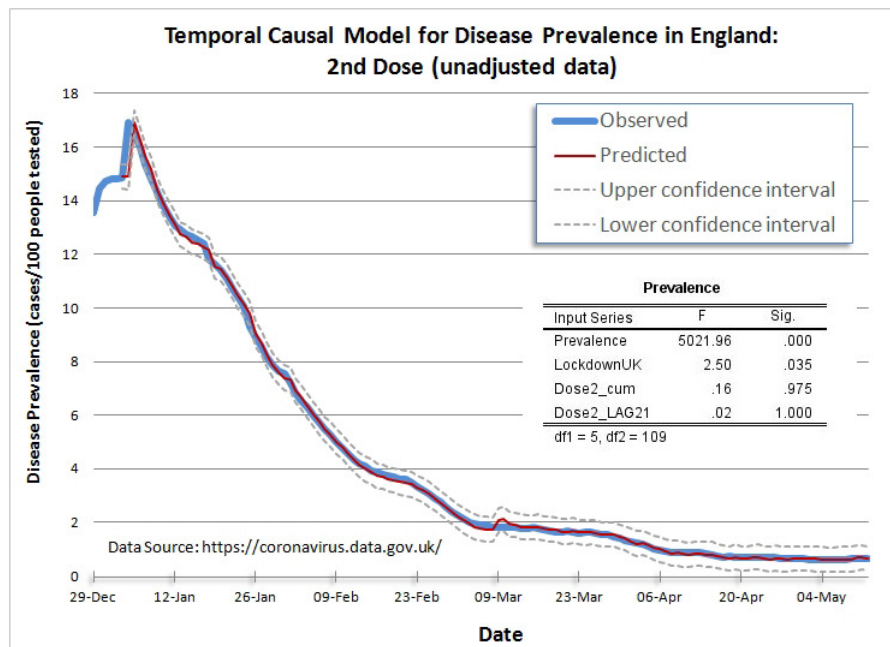
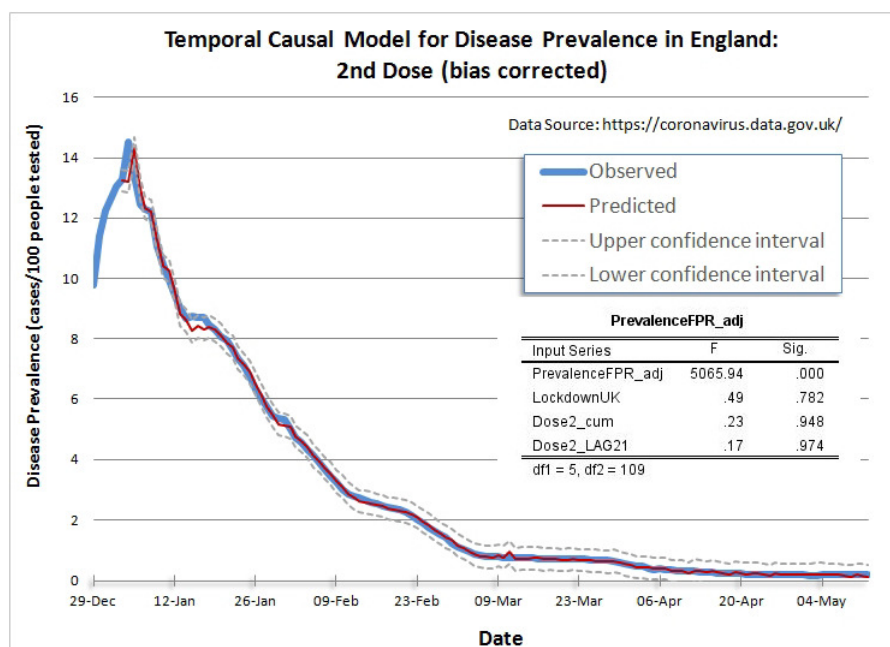
## Vaccination & Disease Prevalence (2<sup>nd</sup> Dose)

In my previous post entitled Vaccination & Disease Prevalence (1<sup>st</sup> Dose) we saw the argument for vaccination benefit in terms of reduced transmission crumble before temporal causal modelling, even after allowing for a 21-day build of post-vaccination immunity. We also saw evidence that lockdown has likely done nothing to ameliorate the situation once we adjust for two sources of sample bias. I ended that post with the suggestion that benefit may not be seen until receipt of the second dose and offered to put this hypothesis to statistical test.

In the first slide we see observed and predicted values along with 95% confidence intervals for a temporal causal model in the prediction of adjusted disease prevalence across England for the period 29<sup>th</sup> December – 12<sup>th</sup> May 2021. The two independent variables of interest are now the cumulative daily count for vaccination 2<sup>nd</sup> dose (Dose2\_cum) and the 21-day delayed cumulative daily count for vaccination 2<sup>nd</sup> dose (Dose2\_LAG21). It should be patently obvious that despite a well-fitting model neither the 2<sup>nd</sup> dose data series nor the 21-day delayed 2<sup>nd</sup> dose data series managed to achieve anything approaching statistical significance at  $p=0.975$  and  $p=1.000$  respectively (though I suspect multicollinearity is at play here, inflating p-value values - something I shall check). There is some evidence of a lockdown effect ( $p=0.035$ ) but we must note this model was based on unadjusted data.

In the second slide we see observed and predicted values along with 95% confidence intervals for a temporal causal model in the prediction of adjusted disease prevalence across England for the period 29<sup>th</sup> December – 12<sup>th</sup> May 2021 using second dose data. After adjusting for bias introduced by false positive case reporting and variation in test regime rigour (tests per person) we now find there is absolutely no impact of lockdown ( $p=0.782$ ), no impact of cumulative 2<sup>nd</sup> dose ( $p=0.948$ ) and no impact of 21-day delayed cumulative 2<sup>nd</sup> dose ( $p=0.974$ ).

This is pretty conclusive statistical evidence that the national vaccination program for England has done absolutely nothing to ameliorate disease prevalence, even after allowing for benefits to accrue after second dosing and delays as immunity builds. It once again reveals the inadequacy of lockdown measures in preventing transmission.



# John Dee, His Almanac

1<sup>st</sup> June 2021

## Case Admission Rate & Vaccination

This morning I am going to continue our exploration by looking at case admission rate (rolling 7-day admissions per 100 cases). I use rolling 7-day data because it serves to iron out administrative issues that arise at weekends – Saturday and Sunday counts often get dumped onto the following Monday. Think of rolling 7-day as weekly data with a week that shifts along a day at a time. There are other summation periods we could use, and we could resort to smoothing of daily data but right now I'm favouring the 7-day method, which is also used by the Office for National Statistics (ONS).

Using raw admission counts to study the pandemic isn't a good idea because these depend on the number of tests undertaken and the PCR cycle threshold. Data authorities around the world haven't realised this and I very much doubt this is down to global statistical ignorance.

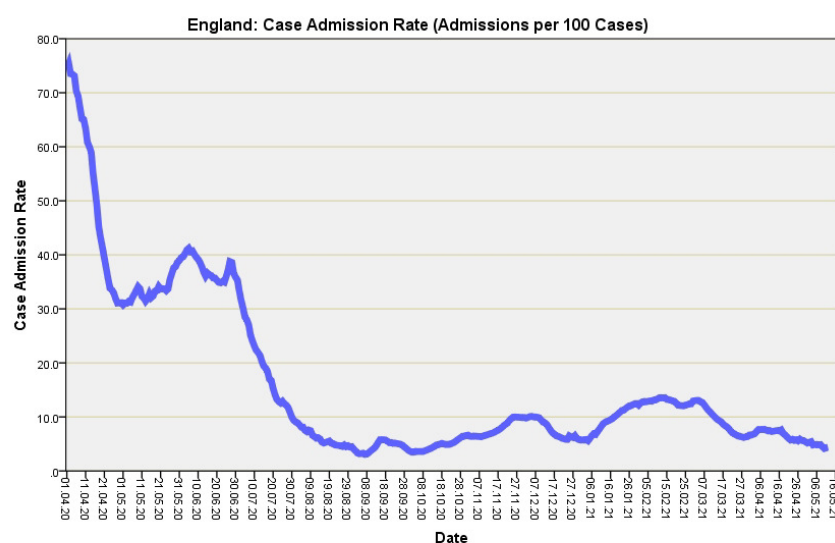
A numerical bonus in using case admission rate is that the bias we may expect in detecting a positive admission is likely to be the same underlying bias we have discovered in detecting a 'case', this bias originating with varying cycle threshold, varying rates of false positive reporting and what I've called test rigour (tests per person). Bias divided by bias will algebraically cancel and so may be ignored.

I shall stress once again that admission counts don't necessarily mean admission due to illness with COVID; what we are calling a 'case' isn't a medical case proper but merely a positive test result. Neither does the admission have to be to a hospital that treats COVID – any admitting service provider will do including maternity units and mental health institutions. Neither does the primary reason for admission have to be COVID-related; those being admitted for hip operations, dialysis, chemotherapy etc will all count if they test positive. Neither does a positive test mean folk are infectious or even carrying the virus (false positive). With all that in mind, let's take a look at historic case admission rate...

In this first slide we get the first glimpse of what has likely been going on (as opposed to what governments and the media have been telling us what has been going on). The blue line depicts the case admission rate using official figures. Quite a story isn't it?

We start off back in April 2020 with high rates of admission, which suggests this was the real deal. As the glorious summer of 2020 kicked-in we saw record levels of testing (see my post entitled *Do People Get Tested When Sick?* dated 29th May) amongst low disease prevalence giving rise to massive rates of false positive reporting that may well have given rise to that blue bump. If so that is one heck of a bunch of miscoded admissions!

Those miscoded admissions will have lead to stressed and over-worked NHS staff coping with the additional burden of COVID protocols simply because the authorities running the show believe in a test that is actually not fit for purpose. We see another minor flurry of admissions activity for last February, which confirms anecdotal evidence – but are looking at a genuine pandemic arising from a novel coronavirus or simply 'case noise' from July 2020 onward? With this valuable data in the pot I shall be zooming in on the last few months to see how the decline in admissions stacks up against vaccine rollout- stay tuned!



Source: <https://coronavirus.data.gov.uk/>

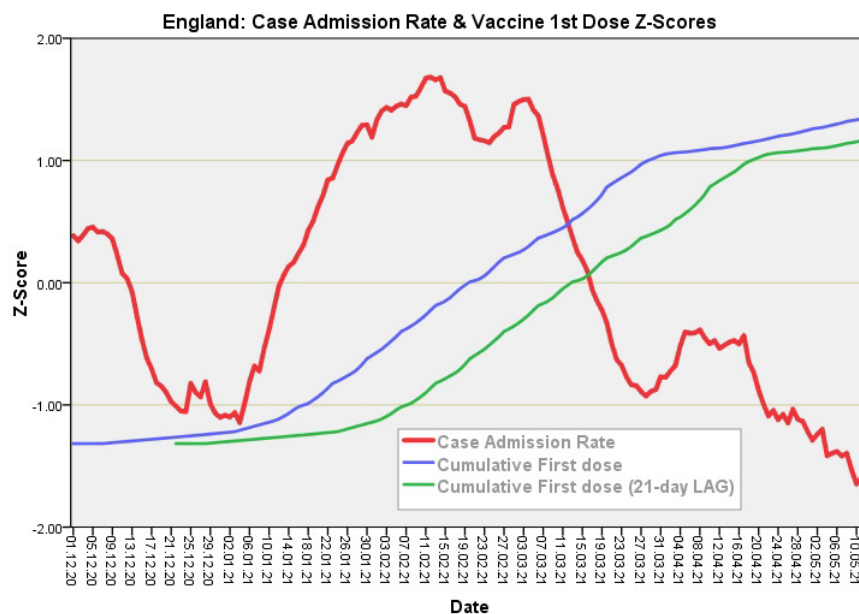
## Case Admission Rate & Vaccination (Nutshell)

Back on 31st May in a post entitled *The Problem In A Nutshell* I produced one slide that captured the issue of attempting to assess the benefit of the national vaccination programme on disease prevalence. This morning I've provided a similar slide for case admission rate. What we are looking at are Z-Score transforms for the period 1st December 2020 – 16th May 2021 for three key variables (Z-scores enable us to plonk everything on the same graph so we may more easily compare variables and spot patterns as well as likely relationships).

There is just a single series for case admission rate this being the unadjusted raw data series derived from official figures (red line). That big blue line is the 1st dose cumulative daily total, which kicked-off on 8th December 2020. Data authorities such as Public Health England (PHE) are allowing a 21-day delay within their analyses to allow immunity to build and I shall do the same, this being the series depicted in green.

We now see quite clearly that the case admission rate surged as the vaccination program got going. There's no way of knowing whether this is causal or just one of those coincidental things whereby vaccination took place as seasonal admissions for any condition tended to naturally rise.

There is certainly a profound decline in case admission rates from March onward and I shall be turning once again to temporal causal modelling (TCM) to get a handle on whether this can be ascribed to vaccination benefit.



Source: <https://coronavirus.data.gov.uk/> Data Period: 1st Dec 2020 - 16th May 2021

3<sup>rd</sup> June 2021

## Case Admission Rate & Vaccination (TCM)

In my previous post entitled *Case Admission Rate & Vaccination (Nutshell)* we discovered a sizeable hump, with CAR rising to a peak of 13.57 admissions per 100 cases on 12th February 2021 before settling back into a decline. The thing to remember here is that CAR is a proxy measure of disease severity and not a measure of infection, so we're not talking transmission – we're talking development.

The usual caveats apply in that COVID admissions to hospital do not necessarily mean folk are sick with COVID symptoms or are even carrying the virus (false positive), neither does the admitting hospital have to be a place where COVID is treated. All they have to be is somebody testing positive before going for whatever test or treatment they need. Because of this incredibly sloppy definition we have to acknowledge that what we are looking at is run-of-the-mill NHS admissions business with a COVID tag. If things don't make sense from here on please bear this in mind!

To give the vaccines a fair crack of the whip I decided to play a straight bat, mix metaphors, and restrict my study period to 12th February – 12th May i.e. we are just going to consider the decline in CAR.

In the attached slide we see observed and predicted values along with 95% confidence intervals for a temporal causal model in the prediction of case admission rate across England for the period 12th February – 12th May 2021. The two independent variables of interest are the cumulative daily count for vaccination 1st dose (Dose1\_cum) and the 21-day delayed cumulative daily count for vaccination 1st dose

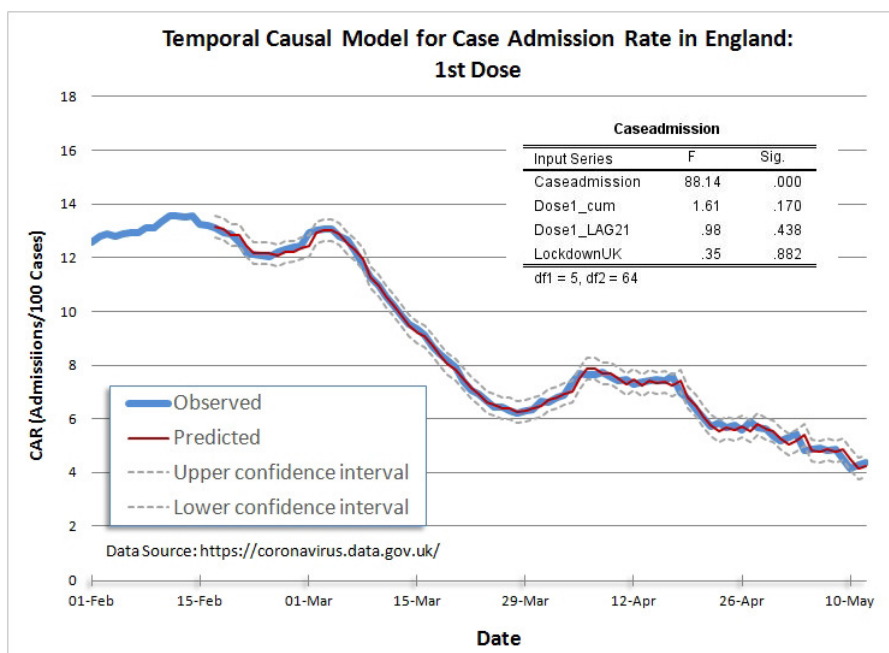
(Dose1\_LAG21), though I have also used a binary indicator variable for lockdown status (LockdownUK). The reason I've added a second 21-day delayed series for vaccination is to permit development of immunity, this following the methodology established by Public Health England (PHE).

It should be patently obvious that, despite a well-fitting model, neither the 1st dose data series nor the 21-day delayed 1st dose data series managed to achieve anything approaching statistical significance, sitting as they do at  $p=0.170$  and  $p=0.438$  respectively. Neither is there any evidence in support of a lockdown effect ( $p=0.882$ ). In plain English, the case admission rate is doing its own thing regardless of lifting of lockdown restrictions and the national vaccination rollout program.

Some may argue that it is only when folk have their second jab that we'll see any benefit to vaccination. This plausible hypothesis was put to the test using temporal causal modelling (TCM) in the same manner only to find lack of statistical significance for the cumulative daily count for vaccination 2nd dose ( $F = 1.86$ ,  $df1 = 5$ ,  $df2 = 69$ ,  $p=0.113$ ), and for the 21-day delayed cumulative daily count for vaccination 2nd dose ( $F = 1.36$ ,  $df1 = 5$ ,  $df2 = 69$ ,  $p=0.250$ ).

This is pretty conclusive evidence that the national vaccination program for England has done absolutely nothing to ameliorate disease severity (in terms of admission requirement for identified cases) even after allowing for benefits to accrue after second dosing and delays as immunity builds. The analysis once again reveals the inadequacy of lockdown measures.

Despite the analytical confections concocted by PHE, analysis of actual empirical data held by UK GOV does not provide evidence of a national benefit to vaccination in terms of case admission rates. We may thus question the design, integrity and efficacy of clinical trials run by the various manufacturers that purport to show benefits with modest samples of carefully chosen subjects; the English nation of 51.2m adults receiving 39.5m doses is telling us a very different story.



**4<sup>th</sup> June 2021**

### ***Mechanical Ventilation Bed Rate***

Here's an interesting little slide that popped out of this morning's data prep. In pursuing my analysis of vaccination benefit (or lack thereof) I took the logical next step from considering COVID admissions per 100 cases to designated mechanical ventilation (MV) bed use per COVID admission. There is a large fly buzzing in the proverbial ointment in that this series exceeds a rate of 1.00 for a substantial proportion of the study period; how is this possible?

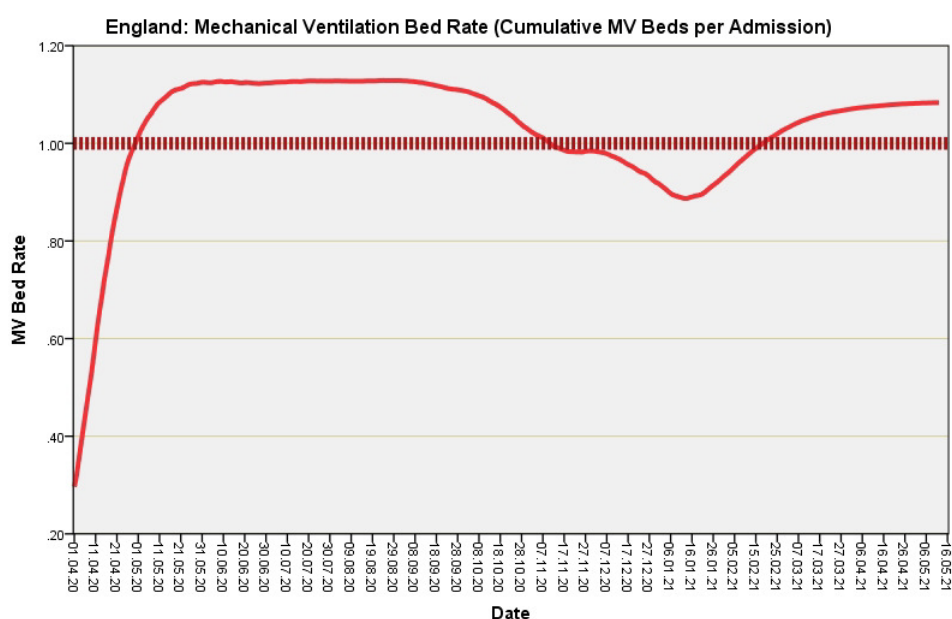
It is only possible if MV beds are not being populated by folk sick with COVID who are also coming in through the 'front door' (like the media and government claim) but by sick folk already in hospital for some other reason. By definition these folk were not in hospital because of COVID otherwise they'd be counted as a COVID admission. The numerically-minded may wish to note that this series is based on cumulative figures for admissions and MV beds to avoid wrinkles in the ratio arising from delays in treatment.



In this regard the usual caveats apply to the numerator in that COVID designated MV bed use does not necessarily mean folk are sick with COVID symptoms per se and such folk may not even carrying the virus (false positive). Neither does MV bed use mean the MV functionality is being used – in my experience bed managers are not that fussy when it comes to shifting patients. We may reasonably assume MV bed patients are generally pretty sick but non-COVID respiratory illness didn't magically go away in these damp islands just because talking heads at DHSC/PHE/NHS say so. Bacterial pneumonia still kills, as does asthma, emphysema, COPD and all the rest; this group of conditions being one of England's biggest killers.

As regards the denominator, COVID admissions to hospital do not necessarily mean folk are sick with COVID symptoms or are even carrying the virus (false positive), neither does the admitting hospital have to be a place where COVID is treated. Yes, really. All they have to be is somebody testing positive before going for whatever test or treatment they need. In fact an 'admission' isn't necessarily an admission – any inpatient testing positive magically becomes a COVID admission! What we have here is another fine example of the PCR test producing diagnostic garbage that is mixed with incredibly sloppy data definitions, and leading to utter lack of genuine clinical meaning at a time when you'd think this would be paramount.

If we set aside these issues for now we see the first admissions back in April/May 2020 - whether genuine front door or recycled inpatients - were put straight on to MV ventilation as per WHO guidance (clinicians now realise this was a very bad idea). The cumulative MV bed use ratio exceeded a value of 1.00 on 1st May 2020, at which point we are no longer looking at 'front door medicine' despite the pandemic being sold to the public as such.



Source: <https://coronavirus.data.gov.uk/>

5<sup>th</sup> June 2021

### ***MV Bed Ratio & Vaccination (nutshell)***

Moving up from case admission rate in terms of disease severity proxy measure is mechanical ventilation (MV) bed ratio, defined as the ratio of COVID-designated MV beds to COVID-designated standard hospital beds. The usual caveats apply in that COVID designated MV bed use does not necessarily mean folk are sick with COVID symptoms per se and such folk may not even carrying the virus (false positive). Neither does MV bed use mean MV functionality is being used – in my experience bed managers are not that fussy when it comes to shifting patients.

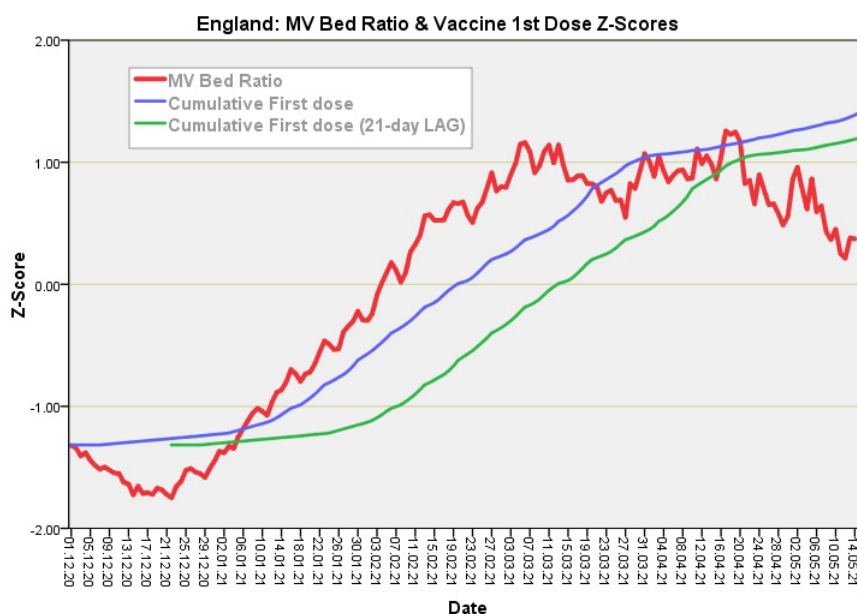
We may reasonably assume MV bed patients are pretty sick but non-COVID respiratory illness didn't magically go away in these damp islands just because talking heads at DHSC/PHE/NHS say so. Bacterial pneumonia still kills, as does asthma, emphysema, COPD and all the rest; this group of conditions being one of England's biggest killers.

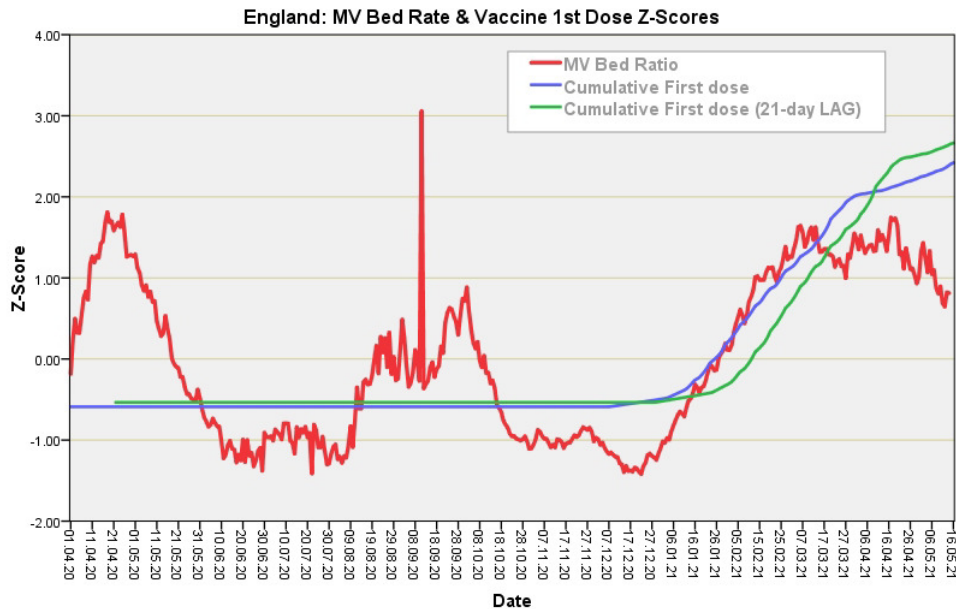
As regards the denominator, the same applies in that COVID designated hospital beds do not necessarily mean folk are sick with COVID symptoms or are even carrying the virus (false positive). The good news for us analysts is that any bias inherent in designating MV beds as 'COVID' will likely also apply to designation of standard hospital beds and so this should cancel algebraically, leaving us with something reasonable to consider.

In the attached slide what we are looking at are Z-Score transforms for the period 1st December 2020 – 16th May 2021 for three key variables (Z-scores enable us to plonk everything on the same graph so we may more easily compare variables and spot patterns as well as likely relationships). There is just a single series for MV bed ratio (red line) this being derived from official figures. That big blue line is the vaccine 1st dose cumulative daily total, which kicked-off on 8th December 2020. Data authorities such as Public Health England (PHE) are allowing a 21-day delay within their analyses to allow immunity to build and I shall do the same, this being the series depicted in green.

The MV bed use ratio is seen to rise concomitantly with vaccine rollout for a substantial portion of time. Before folk blow their gasket we must remember these may be inadvertent correlations brought about merely by the passage of time – two things ‘going up together’ doesn’t imply causality (think Nicholas Cage and swimming pool deaths). Likewise two things ‘going down together’ doesn’t imply causality, and neither does ‘one thing going up and the other coming down’ imply causality despite what analysts at PHE claim for vaccine benefit. We are faced once again with a plate of time spaghetti and I shall be using temporal causal modelling in an attempt to unravel the situation.

Although it looks like vaccination is leading to increased reliance on MV beds we must remember that the elderly and vulnerable tend to end up in these beds regardless, these being the very same folk who were targeted in the vaccination program at the outset. This could be a fine example of propensity leading us up the garden path!





Source: <https://coronavirus.data.gov.uk/> Data Period: 1st Apr 2020 - 16th May 2021

6<sup>th</sup> June 2021

### ***MV Bed Rate & Vaccination (Delayed 1<sup>st</sup> Dose)***

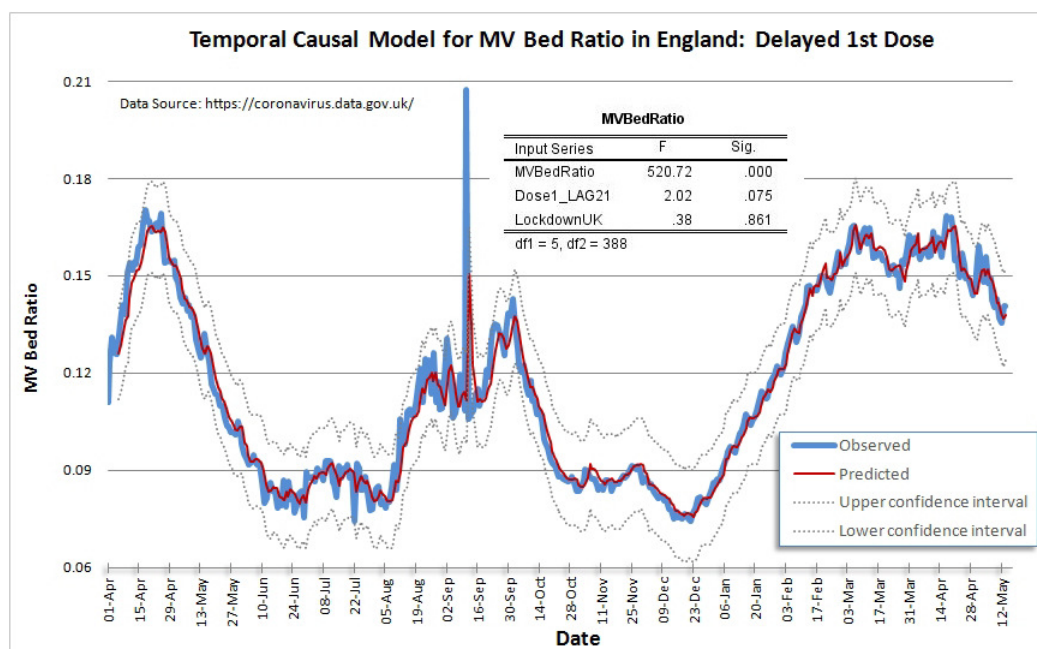
In my post entitled MV Bed Rate & Vaccination (nutshell) we discovered what appeared to be an alarming correspondence between mechanical ventilation (MV) bed ratio and cumulated 1<sup>st</sup> dose such that it looked like vaccines were hammering folk. Correlation is not causation as we say (though PHE seem to ignore this sage advice, as does SAGE) and I suggested we do not blow our gasket just yet! I pulled back to provide the bigger picture in MV Bed Rate & Vaccination (bigger picture) and we realised that scary surge in MV bed use ratio wasn't unique, thus I offered to run temporal causal modelling to see what the computer says. Computer says no.

Before we get stuck in we must acknowledge that the usual caveats apply in that COVID designated MV beds are for folk who simply test positive and, since false positives abound, the sick patient requiring such a bed may not even be carrying any virus let alone be displaying symptoms. Neither does MV bed use mean the mechanical ventilation function is used – any bed is fair game to a bed manager under pressure. I shall remind folk once again that run of the mill respiratory conditions in England did not magically disappear when COVID appeared despite what talking heads at DHSC/PHE/NHS may claim. Lung cancer, emphysema and bacterial pneumonia are still lung cancer, emphysema and bacterial pneumonia though these days it is fashionable to call them COVID-19.

In the attached slide we see observed and predicted values along with 95% confidence intervals for a temporal causal model in the prediction of MV bed ratio across England for the period 1<sup>st</sup> April 2020 – 16th May 2021. First dose vaccination rollout began 8<sup>th</sup> December 2020 and I have allowed a 21-day window for immunity to develop (or trouble to set in), hence the lagged series. The two independent variables of interest are the cumulative daily count for vaccination 1st dose (Dose1\_LAG21) and a binary indicator variable for lockdown status (LockdownUK).

Despite a well-fitting model (R-square = 0.94), the 21-day lagged 1st dose data series did not manage to achieve statistical significance at the 95% level of confidence, sitting as it does at  $p=0.075$  – though this is sailing pretty close to the wind. We may also observe just how ineffective lockdown policy has been in preventing MV bed use ( $p=0.861$ ).

We may hypothesise that if the first dose was genuinely causing problems then any and all doses would surely cause problems, and so I ran TCM again but using the 21-day delayed series for all vaccine doses. When this was done I achieved  $F = 1.79$ ,  $df1 = 5$ ,  $df2 = 388$ ,  $p=0.114$ . This is now sailing into safer waters and I shall suggest we are looking at a wrinkle caused by the propensity of older folk to get jabbed as well as end up on an MV bed. What I think is more valuable here is not the result per se but development of understanding among group members of how tricky statistical analysis can be. One graph leading to one conclusion is often not enough!



7<sup>th</sup> June 2021

## Mortality Rate & Vaccination (Nutshell)

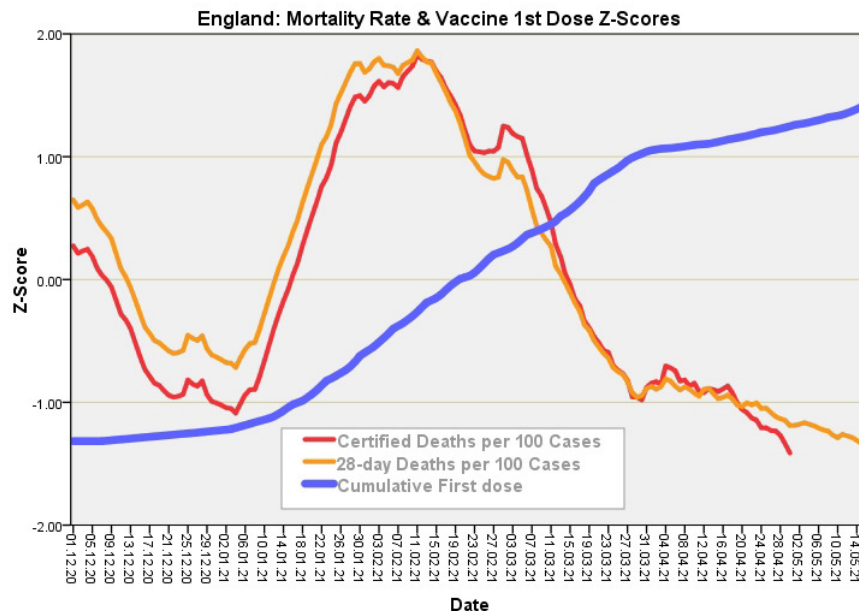
And so we arrive at the nutshell slide for the final frontier, being mortality rate (certified deaths per 100 cases/28-day deaths per 100 cases) and cumulative 1<sup>st</sup> dose Z-scores for the period 1<sup>st</sup> December 2020 – 16<sup>th</sup> May 2021, but first a word about death...

We would think that 28-day death is a pretty robust measure of disease outcome, except that it isn't. A positive test result is all that is needed to trigger a count regardless of clinical course (e.g. terminal cancer patients dying of multi-organ failure will be counted as a COVID case if they test positive in their final days). With a declared disease prevalence of 0.1%, nominal test sensitivity of 80% and a real-world specificity of 97% (at best) then the PCR test is going to be churning out false positives for 97 out of every 100 declared 'deaths'.

We may think that certified COVID deaths would surely offer a robust measure of disease outcome, but this is not so. The death certificate comprises two sections and a certifying physician either records COVID as a cause of death (section I) or co-morbidity (section II). Both sections are counted toward a 'certified death', though WHO/ONS and other authorities claim at least 80% of certificates recording a COVID death are completed as section I causal. The problem here is that what a certifying physician enters on a certificate isn't necessarily what is entered into the system. In the UK software called MUSE (Multicausal and Unicausal Selection Engine) will override anything written by the certifying physician to ensure WHO guidelines for death registration are followed rather than the medical reality. Without a formal audit of those original certificates we won't know just how much fudge has been applied. With all this in mind let us now consider the nutshell slide...

The wonderful agreement between certified and 28-day deaths reminds us just how pervasive WHO protocols can be. As if by magic all death is COVID death and causal at that, just like WHO claims. We see a mighty hump centred on February 2021 that looks mighty seasonal but we're encouraged to ignore this possibility and believe that a pandemic of a novel virus can come and go at will, giving rise to a whole variety of mortality rates.

The big blue vaccine cumulative 1<sup>st</sup> dose line certainly looks like it somehow correlates but is this coincidental or causal? If we take the period 8<sup>th</sup> Dec – 11<sup>th</sup> Feb then we see a strong positive correlation ( $r=0.941$ ,  $n=66$ ,  $p<0.001$  for certified deaths and dose), but if we take the period 12<sup>th</sup> Feb – 14<sup>th</sup> May then we see a strong negative correlation ( $r=-0.986$ ,  $n=78$ ,  $p<0.001$  for certified deaths and dose). We may argue that initial distribution of the 1<sup>st</sup> dose killed all the most vulnerable folk, which is why the death rate eventually plummets. However, we may equally argue that seasonality is giving this appearance, with the correlation being merely coincidental.



Source: <https://coronavirus.data.gov.uk/> Data Period: 1st Dec 2020 - 16th May 2021

8<sup>th</sup> June 2021

## Mortality Rate Big Picture

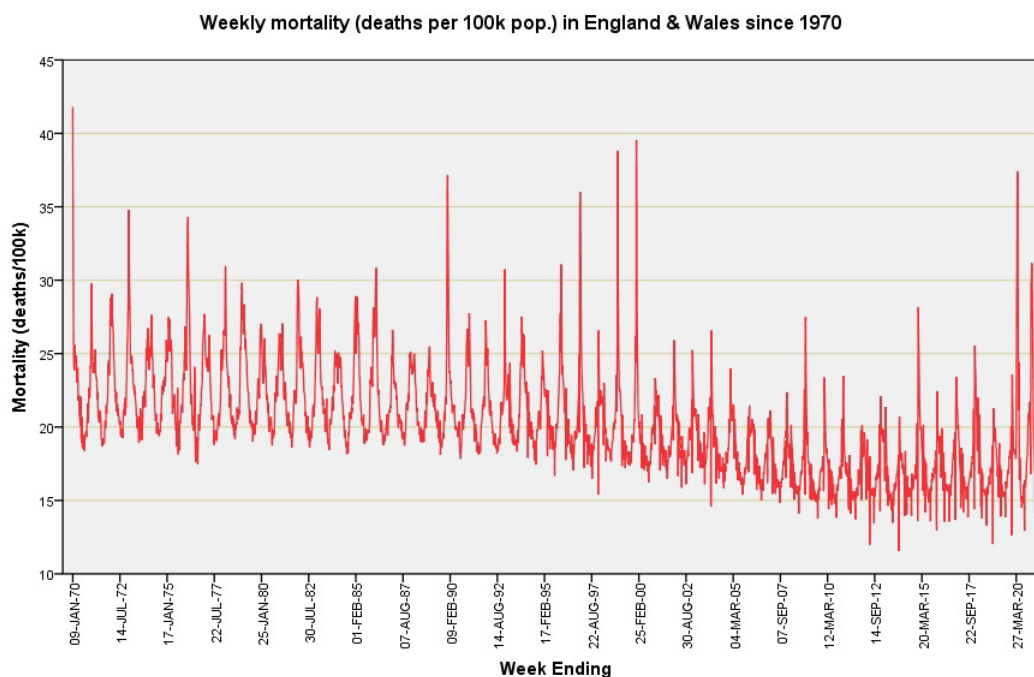
In my previous post entitled Mortality Rate & Vaccination (Nutshell) we left off wondering whether the correlation we spotted over the period 29<sup>th</sup> December 2020 – 16<sup>th</sup> May 2021 was due to vaccines hammering vulnerable folk or mere coincidence. In situations like this it is always a good idea to look at the big picture, so I've been busy obtaining data for the biggest possible picture, this being the weekly mortality rate (deaths per 100k population) for England & Wales since 1970.

This is a fascinating slide that shows us many things. We observe a general decline in the mortality rate for the last 40 years or so that seemed to bottom-out after 2010. This will be due to many factors encompassing economics, welfare, behaviour and technology all leading to a higher standard of health and people living longer. We also observe a highly regular seasonal aspect to mortality, this largely being due to respiratory disease. There are occasional spikes that mark particularly vicious influenza seasons, with the largest of these back in 1970 (41.80 deaths per 100k during w/e 9<sup>th</sup> January). Incredibly the 2020 'pandemic' spike, at 37.42 deaths per 100k for w/e 17<sup>th</sup> April, only manages fourth place behind w/e 7<sup>th</sup> January 2000 (39.52) and w/e 8<sup>th</sup> January 1999 (38.81).

We have discovered that the counting of so-called 'COVID deaths' isn't the exact science we would expect from data authorities at this critical time, with COVID as a co-morbidity being mixed with COVID as causal. We've also discovered that automated cause of death coding (MUSE) ensures WHO guidelines are followed rather than clinical reality. WHO themselves boldly state...

*"With reference to section 4.2.3 of volume 2 of ICD-10, the purpose of mortality classification (coding) is to produce the most useful cause of death statistics possible. Thus, whether a sequence is listed as 'rejected' or 'accepted' may reflect interests of importance for public health rather than what is acceptable from a purely medical point of view. Therefore, always apply these instructions, whether they can be considered medically correct or not."*

...this is where all cause registered death comes in handy. As my wife succinctly and imaginatively put it, "so we have the same bucket of coloured balls but the government has decided to paint them all red"; an extra-terrestrial landing on Earth and looking at this slide would be hard pressed to spot the 'pandemic'. Something certainly is amiss but when we look at the bigger picture the profile of the current pandemic in terms of weekly mortality per 100k population is by no means unique.



Source: Office for National Statistics

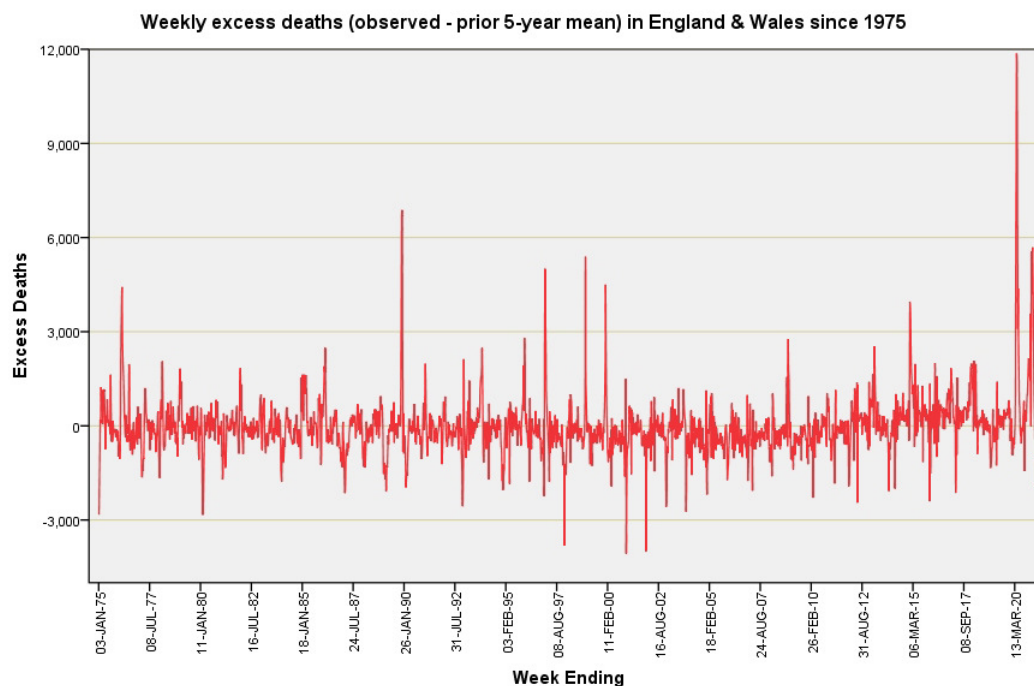
## ***Excess Deaths Big Picture***

There are a number of ways we may go about estimating excess death. One of the simplest but easiest to understand is to calculate the prior 5-year mean number of deaths for the corresponding week and subtract this from observed deaths. In my previous post entitled *Mortality Rate Big Picture* we saw the weekly mortality rate for England & Wales since 1970 and I have used the same data to calculate excess death with respect to the prior 5-year mean (we may note this is the method favoured by the Office for National Statistics).

The pandemic now hits us square on the jaw. There is no mistaking an extraordinary excess of 11,860 deaths w/e 17<sup>th</sup> April 2020 and 11,540 deaths w/e 24<sup>th</sup> April 2020. Before the current period we have to swing back to w/e 22<sup>nd</sup> December 1989 to obtain an excess of 6,876 deaths. Comparing peak with peak we find the 2020 pandemic generating 1.72x as many excess deaths as the next nearest vicious influenza outburst back in 1989.

In terms of extreme excess (defined as >5,000 excess deaths per week) we find a total of 12 weeks from 1970 onward, 8 of which belong to the current pandemic. Clearly something big has been going on but the interesting thing here is that this something big was largely confined to the five week period w/b 28<sup>th</sup> March – 25<sup>th</sup> April, with a lesser showing w/b 2<sup>nd</sup> January – 23<sup>rd</sup> January 2021. How is it possible that a novel viral outbreak can be constrained temporally to this extent?





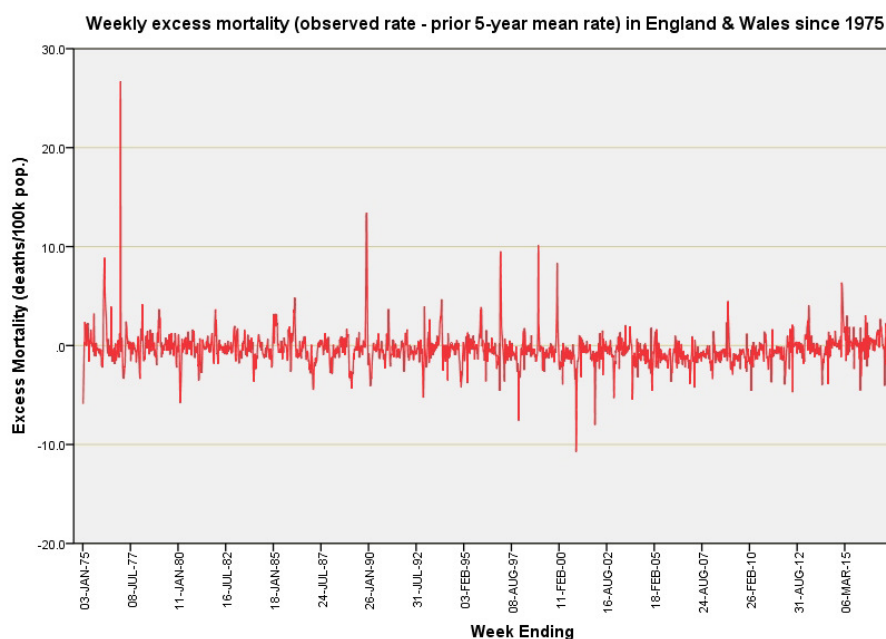
Source: Office for National Statistics

9<sup>th</sup> June 2021

## Excess Mortality Big Picture

In my previous post entitled Excess Deaths Big Picture we got to see an estimate of weekly excess deaths in England & Wales since 1975. The pandemic stuck out like a sore thumb and excellent suggestions were made by members as to the many non-viral causes. A group member very usefully suggested we might like to turn this into a rate rather than looking at absolute numbers and I have done exactly this.

Though the pandemic still sticks out like a sore thumb at a weekly peak of 19.52 deaths per 100k population for w/e 17<sup>th</sup> April 2020, it is now dwarfed by an excess mortality of 26.69 deaths per 100k population that was reached w/e 31<sup>st</sup> December 1976. In terms of peak weekly excess mortality we now see that seasonal influenza can be more deadly than SARS-COV-2 when conditions are ripe.

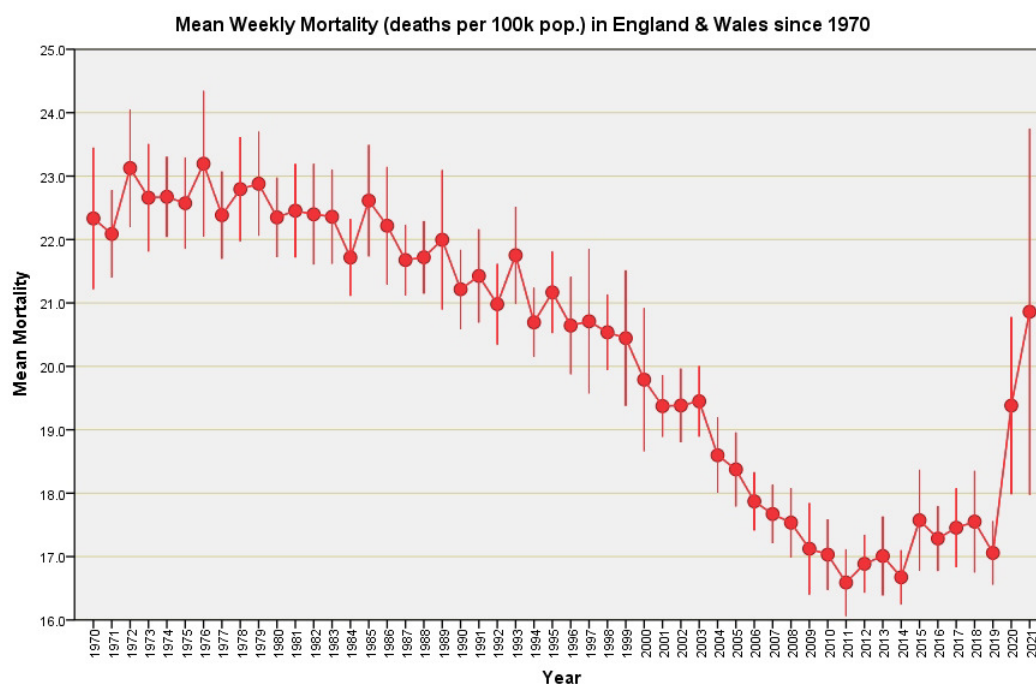


Source: Office for National Statistics

## Mean Weekly Mortality Rate

Another excellent suggestion by a group member has got me reaching for this slide. The problem with weekly mortality is that it's a pretty noisy series, and with 2,681 data points all crowded into a small slide loaded with seasonal variation it can be hard to see the wood for the trees. What I've done is take the raw data used for my post entitled Mortality Rate Big Picture and boiled it down into annualised mean weekly mortality, which enables to see more of the wood.

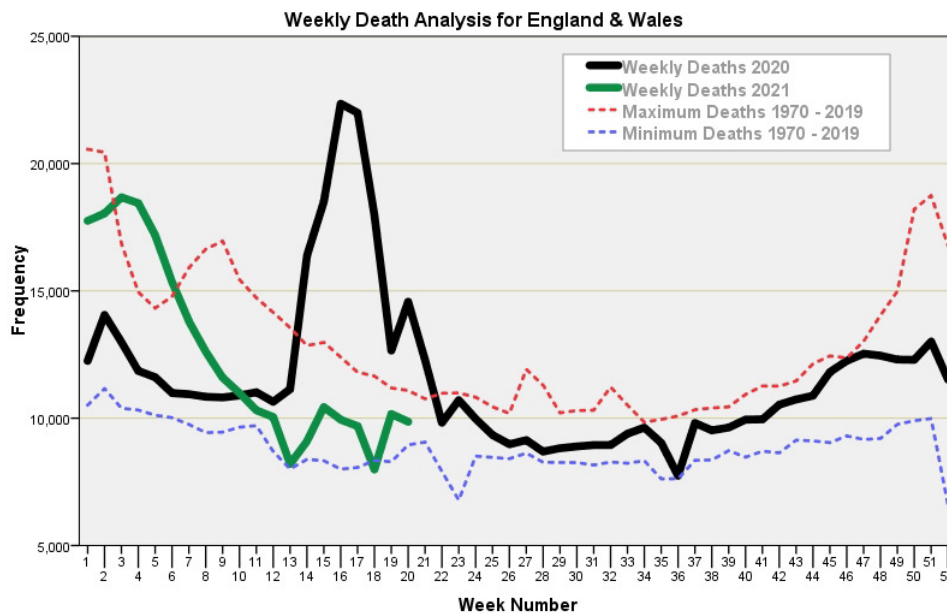
We now see a dramatic slide into better national health that bottomed-out in 2011 and started to creep back up before the pandemic hit. And hit it most certainly did though, of course, we must take care not to ascribe this rise to COVID and COVID alone. The interesting thing for me is that, even with a novel coronavirus on the rampage, mean weekly mortality in 2020 is less than it was back in 2003. Yes indeed, the sudden rise of 2020 is a shocker but this decline in national health isn't unique by any stretch of the imagination – effectively we are now back to mortality rates last seen in the '90s!



Source: Office for National Statistics

## Weekly Death Analysis

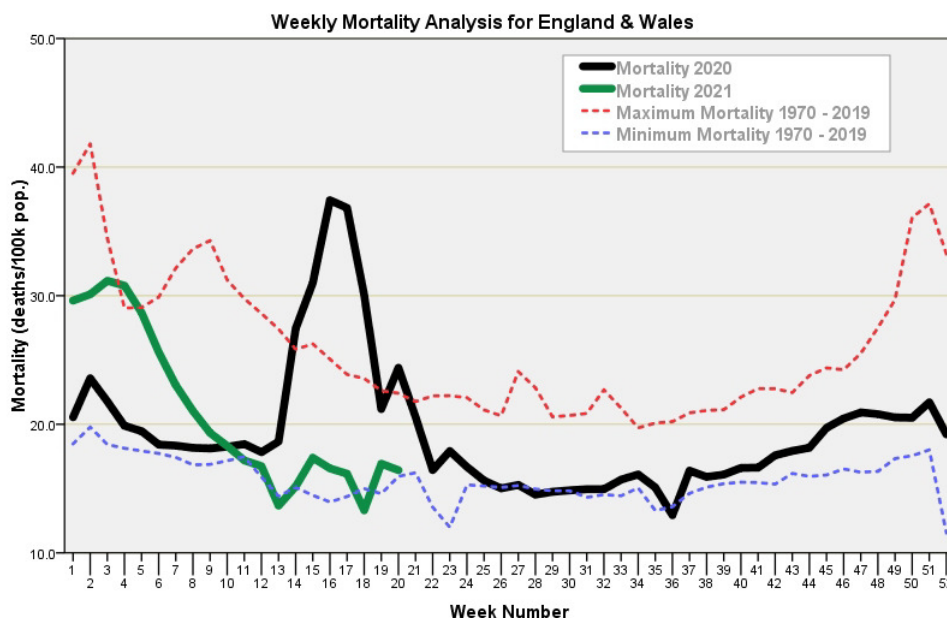
I've been thinking of different ways to present the weekly death data from 1970 onward for England & Wales and have come up with this slide. What we have here are all cause registered deaths by week for 2020 and 2021 set against the minimum and maximum envelope for the corresponding week for the period 1970 – 2019. We may thus see whether weekly deaths for these two most recent years are doing anything odd when compared to 52 years worth of historic data. As regards 2020 historic maxima are exceeded between week 14 and 21 and that's it – weekly deaths after this period bobbed about within the historic envelope. This year only exceeded historic maxima during weeks 3 – 6 and is now bobbling along within the historic envelope. Once again we may ask how a novel virus can act in such a temporally confined manner – were it not for those 8 weeks during spring we wouldn't have anything to show!



Source: Office for National Statistics

## Weekly Mortality Analysis

In my previous post entitled Weekly Death Analysis I introduced a different way of looking at the weekly registered death data from 1970 onward for England & Wales and I'm hoping folk are finding this rather more intuitive. That analysis was concerned with raw weekly counts and so we need to refine it to reflect mortality rate (deaths per 100k population), this being a more appropriate measure to consider when looking at long timescales over which the base population is bound to change significantly. This is quite a powerful visual for it reveals 2021 to be pretty much of a muchness wrt historic trends, with only weeks 14 – 19 of 2020 really doing anything of significance. The 'pandemic' – in terms of mortality rate – only lasted 6 weeks at best, after which mortality has been bobbing along within the envelope defined by historic minima and maxima. Neither has the winter of 2020/21 been much to shout about despite concerted efforts by the UK media, HMG and their lackeys to continue to scare the shit out of folk.



Source: Office for National Statistics

## Age-Related Mortality

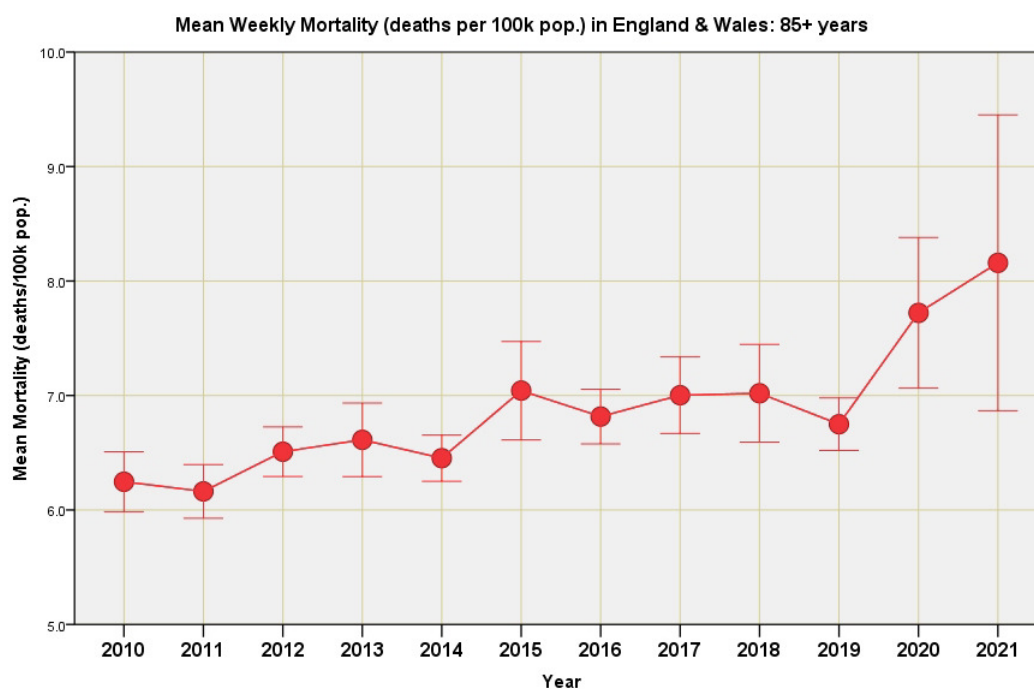
I offer two rather interesting slides for consideration this morning. ONS usefully supply weekly registered deaths for England and Wales by age band going back to 2010 and I've converted these to mortality rates per 100k population. Ideally I'd convert them to rates pertinent to age group rather than the population as a whole but I cannot find decent estimates of population by age band by year - if I can find time I'll place a special data request with ONS.

What I've done is take the two extremes of 85+ years and 15 – 44 years (infant data are available and I may analyse this at some point) and converted busy weekly time series plots into annualised weekly means with 95% confidence intervals to give the clearest picture of what has been going on.

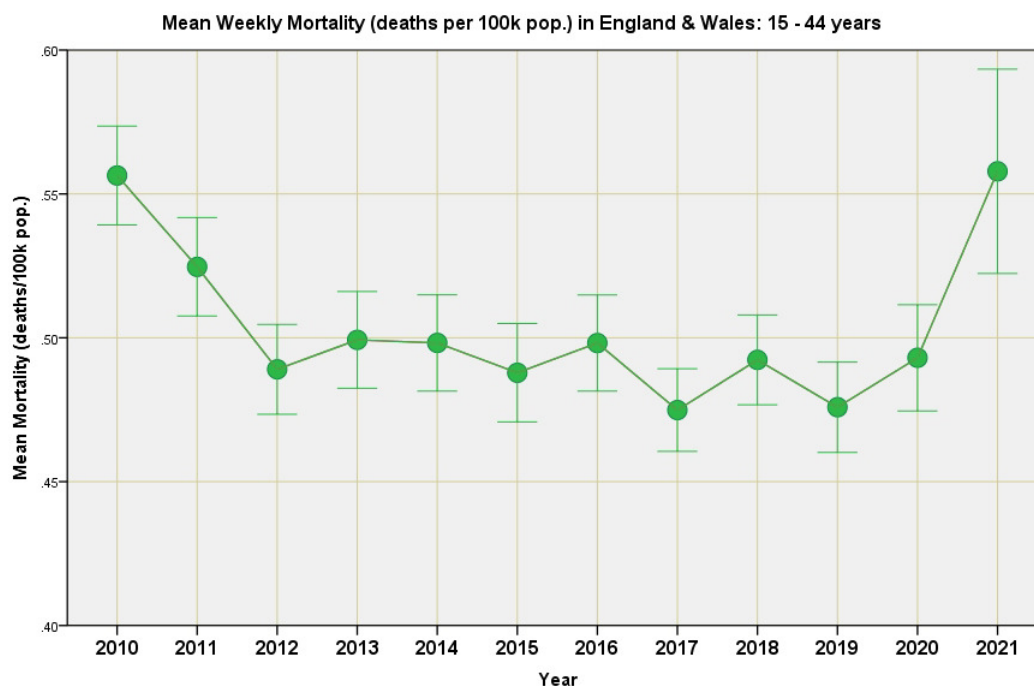
I must say the first slide surprised me somewhat since I was expecting a massive surge in mortality for the oldest age group during 2020 and 2021; what we get seems to be a continuation of a longer trend! Group member Dave Morris very sensibly points out the 'tinderbox' effect among the older population and we see evidence of this right there in that dip for 2019.

The second slide also surprised me since I wasn't expecting the mean weekly mortality for the 15 – 44 year group for the first weeks of 2021 to mirror mortality last seen in 2010! Another bizarre finding is that mean weekly mortality for this age group for the first and second 'wave' of 2020 is pretty much bobbing about the same level as the previous 8 years. What kind of novel virus is capable of determining a person's age before deciding to be kind to younger folk? My guess is the highly contagious political virus politicolio fudgeatestum, which permits secondary infection by the common human parasite mediacoverup fibbingensis.

So why the sudden leap in mortality for the 15 – 44 year group in 2021? Suicide? Domestic violence? Drug and alcohol abuse? Gang warfare? Do I hear the sound of a needle dropping?



Source: Office for National Statistics; Data to 21st May 2021. Mean values with 95% confidence intervals



Source: Office for National Statistics; Data to 21st May 2021. Mean values with 95% confidence intervals

## Respiratory Death Smoking Gun

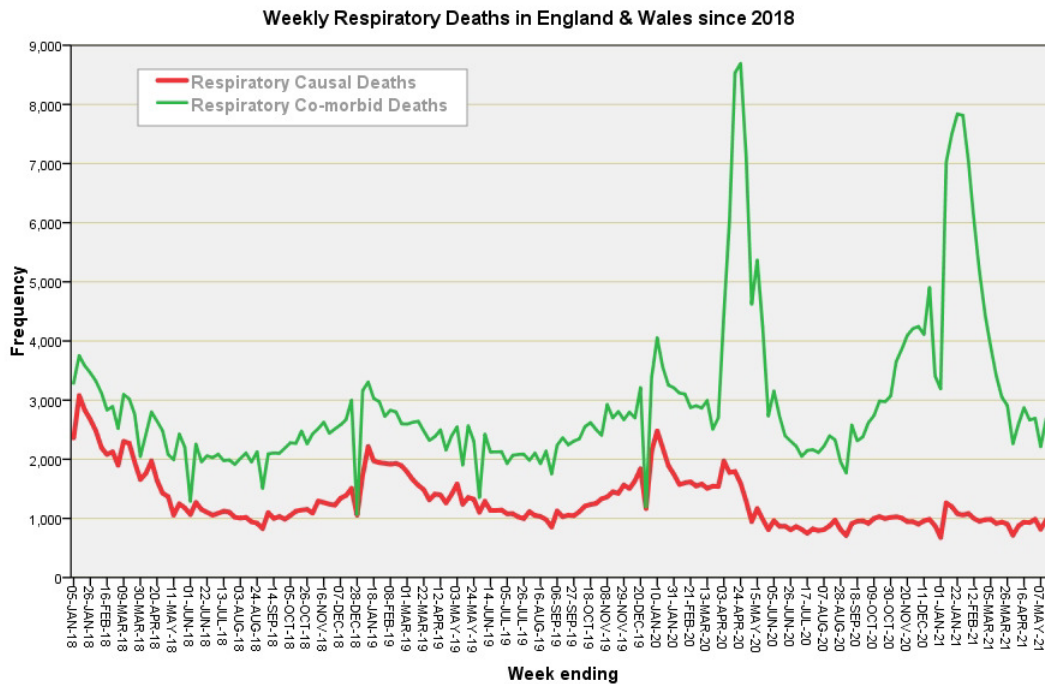
In prepping my database ready for excess death modelling I've come across a smoking gun in the closet that is still warm. Talking heads from DHSC/NHS/PHE all claim the 'flu season for 2020/21 was extremely and unusually mild, with lockdown, social distancing and mask wearing magically curing chronic conditions such as asthma, emphysema, COPD and all sorts of conditions ending with coniosis, not to mention old-fashioned bacterial pneumonia.

In my enthusiasm for getting a grip on death I've inadvertently discovered what the data authorities have actually gone and done with their automated cause of death coding software they call MUSE (Multicausal and Unicausal Selection Engine) – they have mused sufficient to morph chronic and acute respiratory conditions as a cause of death to respiratory conditions as a co-morbidity.

In the slide below you can see how the causal and co-morbid data series usually bob along nicely together like peas in a pod. Sometime during May 2020 the curve for casual respiratory death took an unusual hammering whilst the (modelled) curve for co-morbid respiratory death went through the ceiling during our so-called first and second 'waves'. A neat trick, huh?

What's the betting that those twin green peaks contain an awful lot of respiratory deaths that have been 'accidentally' assigned to COVID as cause, with chronic and acute respiratory conditions relegated to the second division?

If you want to see a smoking gun, here's one with two barrels!



11<sup>th</sup> June 2021

## Respiratory Causal Death (intro)

In my previous post entitled *Respiratory Death Smoking Gun* I revealed the results of multivariate statistical modelling to recreate data that the ONS are not releasing to the public, this being weekly respiratory co-morbid death counts prior to 2021. Two peaks emerged that didn't find their counterpart in observed counts of respiratory causal death and I promised to take a look from t'other end just to check those peaks should be there as predicted. Before I do this we need a refresher on how the data authorities handle respiratory death and I'll start by re-iterating a post made on 19<sup>th</sup> March 2021 under the heading *Jack In The Box*.

Back on 19<sup>th</sup> March I produced a slide of influenza and pneumonia deaths in England & Wales for the period 1901 – 2019; here it is again. You will notice the monster spike that was the Spanish 'Flu and you'll notice something odd happening to counts after 1981. I wrote to ONS to confirm this strange fluctuation was real and not some processing artefact and they confirmed it was most certainly real, arising from changes in coding dictated by WHO. Those changes were summarised in a post entitled 'WHO Rule 3' on 30<sup>th</sup> March and I once again reproduce text from the 2006 ONS national mortality status report that usefully explains matters...

*In general, the main change in introducing automated cause coding was in the interpretation of WHO Rule 3, one of the rules used to select the underlying cause of death. The interpretation of Rule 3 was broadened by OPCS in 1984, so that certain conditions that are often terminal, such as bronchopneumonia (ICD-9 485) or pulmonary embolism (ICD-9 415.1) could be considered a direct consequence of any more specific condition reported. The more specific condition would then be regarded as the underlying cause. This change in interpretation meant that deaths from certain conditions such as pneumonia declined in 1984, while deaths from conditions often mentioned in part II of the death certificate increased. The change in 1993 was thus to move back to the internationally accepted interpretation of Rule 3 operating in England and Wales before 1984. The effects of moving back to this earlier interpretation of Rule 3 have been discussed elsewhere. Deaths assigned to external causes were excluded from the Rule 3 change in 1984 because the procedures for assigning underlying cause of death based on coroners' verdict were unaffected by WHO rules.*

*The rule that changes cause of death statistics most is Rule 3. In ICD-10 the list of conditions affected by Rule 3 is more clearly defined than in ICD-9 and is also broader in scope. Its impact is to reduce the number of deaths assigned to certain conditions such as pneumonia and to increase the number of deaths assigned to chronic debilitating diseases. In England and Wales, about 20 per cent of deaths mention pneumonia so the effect of the change in Rule 3 is large.*

*1984 - OPCS decided to amend its interpretation of WHO Rule 3 in the assignment of underlying cause of death. This amendment is covered in more detail in section 3.2. It resulted in a decrease in the numbers of deaths coded to pneumonia and a few other causes, and an increase in deaths from many other conditions – most of the latter being small increases. The background to this change is*



given in the annual volume for 1984 in the DH2 series which includes a table assessing the numerical effects of changes, by underlying cause.

1993 - OPCS decided to revert to the internationally accepted interpretation of Rule 3 operating in England and Wales before 1984 (see section 3.2).

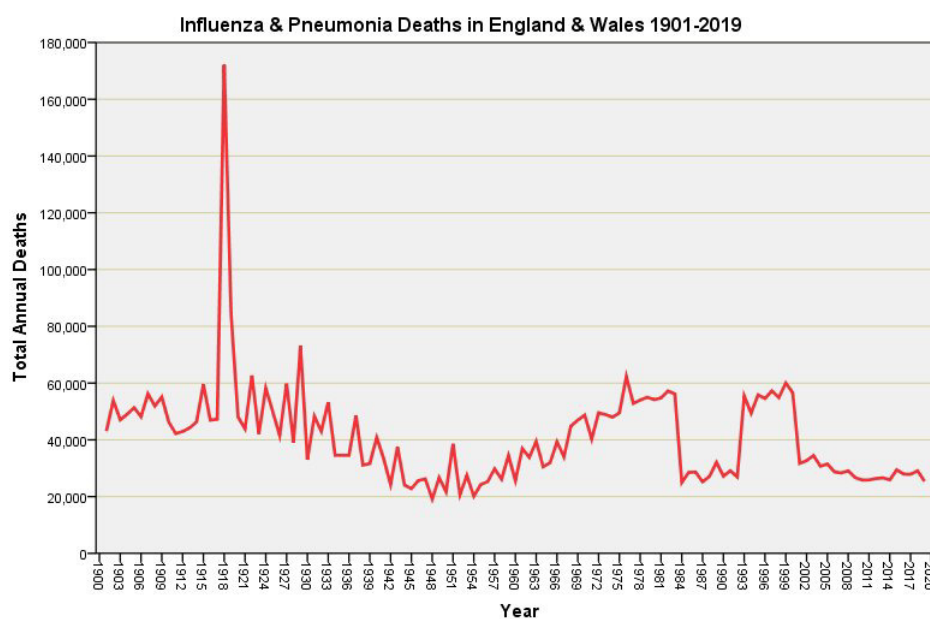
2001 - Introduction of the Tenth Revision of the International Statistical Classification of Diseases for coding cause of death on 1 January 2001. This replaced the Ninth Revision used from 1979 to 2000. There are some significant differences between the ICD versions. The main differences are:

- a change in format of the code and an expansion in the number of codes used
- a movement of some diseases and conditions between broad groups called ICD chapters
- changes to the rules governing the selection and coding of the underlying cause of death, especially Rule 3, which has had a large effect (see section 3.2)

Thus the reason for that Jack in the box effect is the WHO farting about with clinical coding, and here it is in B&W in a report laid before the UK parliament for all to see. This farting about greatly reduced how we go about count deaths arising from pneumonia, and thus influenza-induced pneumonia. And there we all were thinking all those new 'flu vaccines were doing a grand job!

We should note that the data series dating from 2001 is coded under WHO rule 3, which means fewer deaths from influenzal pneumonia than we used to count, which is why the current pandemic tends to look like a sore thumb. Whilst we have suppressed reporting of deaths due to influenzal pneumonia under WHO rule 3 we somehow have ignored this ruling when it comes to counting alleged COVID-19 deaths.

In my next post we shall take a look at weekly respiratory causal death from 2010 onward and we must bear in mind that the figures we shall see will remain suppressed in comparison to historic data. I shall thus be extending my modelling to reveal what the series for respiratory causal death should look like if WHO Rule 3 was trashed.



Source: Office for National Statistics

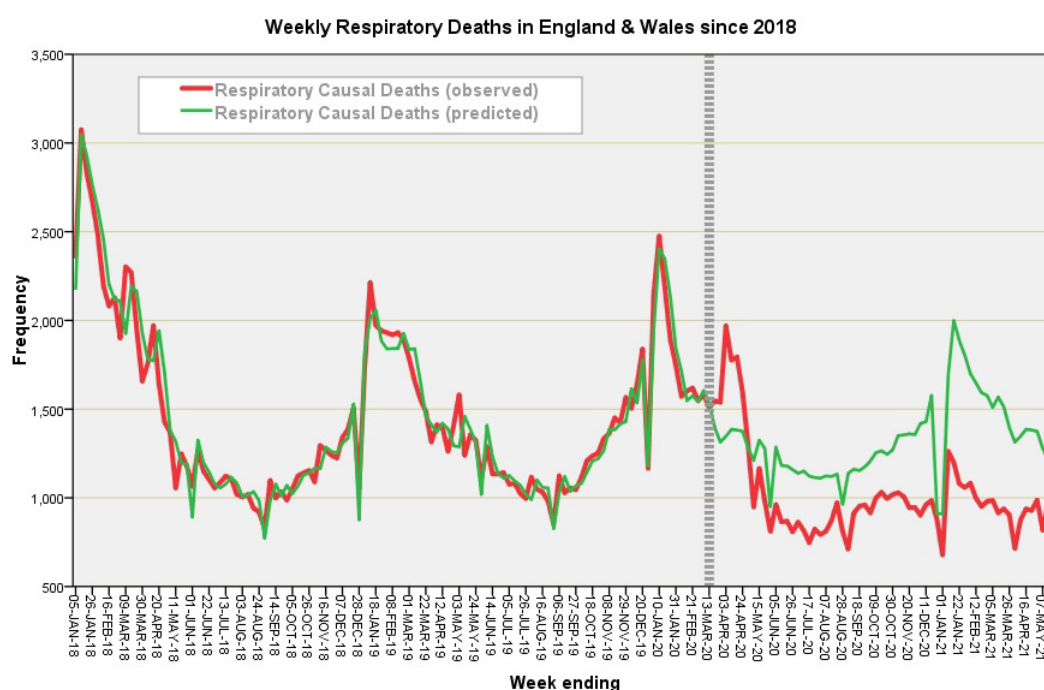
## Respiratory Causal Death (ARIMA)

So how do you go about predicting the weekly number of respiratory causal deaths for 2020 and 2021 if you don't trust the official figures? There are several ways to do this but my favoured method is to reach for a fabulous spanner called ARIMA (Autoregressive Integrated Moving Average) time series modelling. This technique enables a data series to produce future predictions of itself using only itself, which I appreciate is a bit mind boggling. An analogy is to predict tomorrow's weather will be the same as today and that it will be raining on sports day i.e. if a time series contains cyclical information then that information can be used to predict future cycles. We can extend this in a multivariate

manner by asking if another time series can also be used to assist in prediction. For this purposes of this modelling run I decided to use the prior 5-year mean weekly count of respiratory causal death as a supporting predictive series, which turned out to be a corker ( $p < 0.001$ ).

The time frame used to generate the prediction started at w/b 2<sup>nd</sup> January 2010 and ended w/b 7<sup>th</sup> March 2020, this cut-off being marked by a dashed grey line in the attached graph. For clarity of presentation I have only shown predictions made from w/b 5<sup>th</sup> January 2018 onward. Prior to my cut-off date we see the ARIMA predictive model tracking the observed weekly counts very nicely indeed, which gives us faith that the model is reasonably reliable. After the cut-off date we see observed and predicted counts diverge significantly.

That green line indicates what actual counts are most likely to have been if the data authorities had been playing a straight bat rather than fiddling around with MUSE and following WHO directives to make COVID look as deadly as possible. We may conclude there was a winter peak for causal respiratory death after all but that these deaths have been attributed to COVID.



Source: Office for National Statistics; Data to 21st May 2021.

12<sup>th</sup> June 2021

## Handling The Past

The problem with the past is that we did things differently back then. Not just in terms of diagnosis, treatment and medication but in terms of the whole patient journey from pain to post mortem. And that's just one aspect – we have to consider nutrition, attitudes, behaviours, technology, employment, GDP, population, warfare, immigration, housing, welfare, contraception and much else. We could fill out a whole page; death as an endpoint is subject to an endless list of factors.

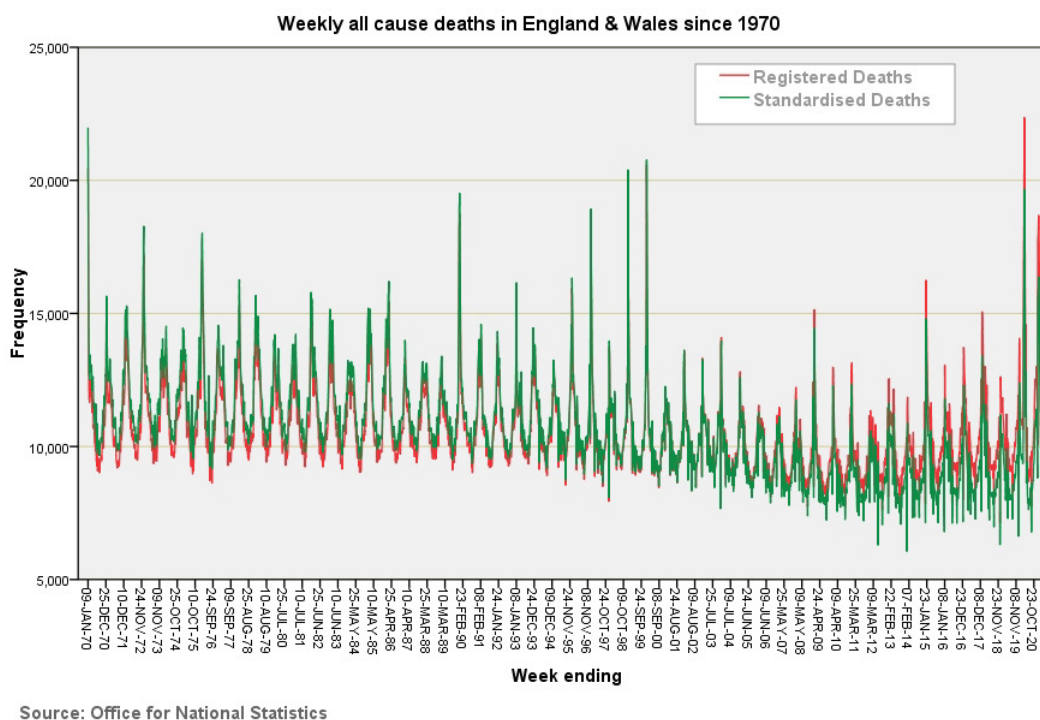
It should come as no surprise that we cannot adjust for the vast majority of these since nobody has sufficiently comprehensive data. Sometimes we are lucky to have a few variables at our disposal with gender, age, occupation and population being the favourites of the epidemiologist. Even if we were lucky enough to possess a database with 1,000 relevant factors somebody could come along and point out we haven't adjusted for changes in footwear. Does this make our analysis invalid? No, it simply means our analysis, like every other analysis ever undertaken, is only an approximation of the truth and has its strengths and weaknesses.

The alternative is to forget the distant past and only look back a few years with the assumption that things won't have changed that much. We forget this is mere assumption. Not only that but we then run slap bang into major analytical issue and this concerns the validity of generalising on the basis of a time-limited analysis. We often hear the media war cry "since records began"; well if those records started three years ago that's not saying much. We can't win this game so we have to compromise.

So far the primary method I have been using to adjust for the past is by reverting to the classic deaths per 100k population. It would be lovely to refine this in terms of age adjusted mortality (AAM) but the problem is complete lack of population data factored by age that is sufficiently

robust. Sure there are studies that offer this but these are always heavily restricted in time – usually covering just one or two years. Even so, therein lies a hidden issue – take something as robust as registered death and factor it using a rather ropy age distribution gathered from an incomplete or estimated survey and you end up with ropy age-adjusted mortality. Sometimes you end up with tripe; impressive-looking tripe maybe but tripe nevertheless. Unless ONS can offer me fabulous estimates of population by age band for each and every year dating back to 1970 (or at least 2010) then age adjustment will remain a pipe dream for now!

This morning I put age down and explored an alternative to the ubiquitous deaths per 100k population, this being something I'm calling 'standardised death'. The object here is similar to techniques used in AAM and that is to standardise death counts with respect to a reference population. The mean population of England & Wales for the years 1970 – 2021 turns out to be 52,526,962 which puts is back in the year 2002. It is then an easy matter to derive a weighting to apply to death counts that standardises these to the 2002 population. The handy thing here is that standardised death counts enable us to run all sorts of analyses at the push of a button knowing we've accounted for population changes. I attach the first output from this little experiment so you may see how raw death counts look when we standardise them to the population back in 2002. I rather like this approach and will be using it to estimate excess death.



## Estimating Excess Death

This is an impossible task largely for reasons given in my previous post entitled Handling The Past. There are also numerous methodological issues and pitfalls. What I am going to do, therefore, is keep my analysis simple and base it on the technique favoured by ONS and that is to rely on the prior 5-year mean death count as the baseline from which deviations are calculated. In plain English this means taking the observed death count in, say, week 26 of 2020 and subtracting from it the mean count for week 26 for 2019, 2018, 2017, 2016 and 2015. Simple!

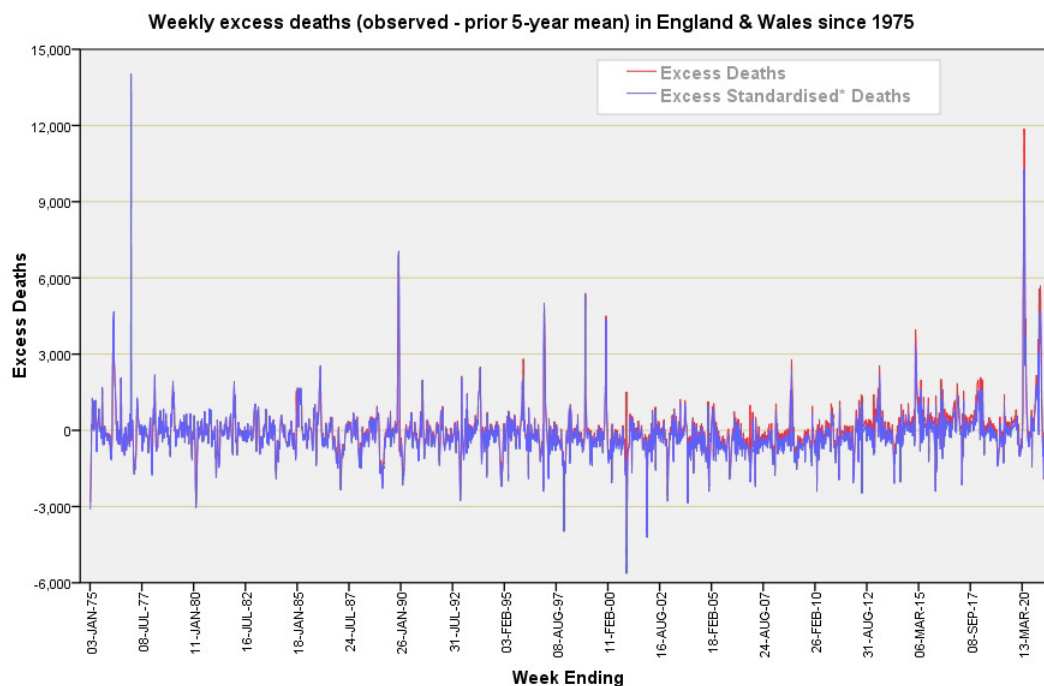
There are issues in that a week-by-week comparison is somewhat artificial when it comes to death and disease (which are not weekly creatures) but we have to start somewhere. This is compounded by the fact that administrative delays in death registration can seriously mess matters up, as can a 'flu season that starts a couple of weeks later than usual. Then there's the headache of handling 53 week years for which a 5-year prior mean is pointless (2020 was one such year, there being only 8 such years since 1970). To get around this I opted to average the preceding week 52 and the following week 1 by way of compromise. Averaging 2015, 2009, 2004, 1998 and 1992 as a baseline for 2020 seemed somewhat bonkers.

Then there's the headache of handling the first 20 weeks of 2021 whose prior 5-year average would include the first 20 weeks of 2020. Ouch. To get around this I opted to transcribe the baseline means for the first 20 weeks of 2020 and use them for 2021. Not ideal but that's what ONS have also done, so I'm in good company. Suggestions welcome!

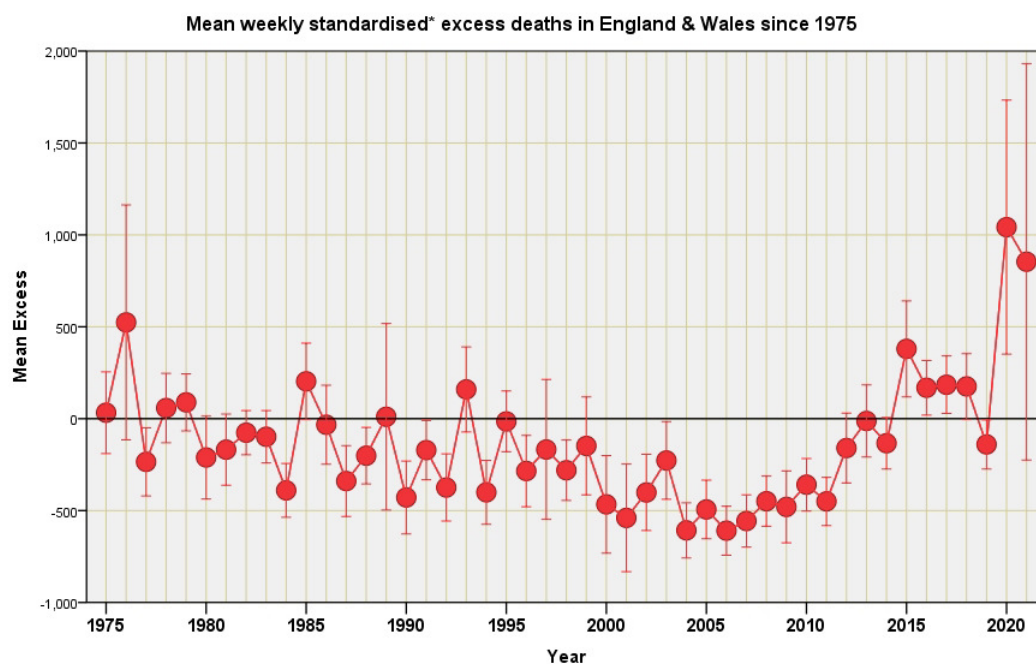
The good news is my standardised death count approach removes the population bias that would have been inherent in averaging over, say, 2019, 2018, 2017, 2016 and 2015 and thinking this applies to 2020 – it doesn't but that's what some analysts do forgetting a death in 2015 occurred within a smaller population than a death in 2019. Hopefully the logic behind my farting about with standardisation now becomes abundantly clear!

With the gist of it thrashed out let's look at the first slide, being a comparison of excess deaths using unadjusted and standardised death counts. We see a great deal of bobbing about the zero axis punctuated by occasional exceptionally good and bad weeks, though please do bear in mind what I've said about death and disease not being a weekly creature. With this in mind for the second slide I've taken the same series and produced annualised weekly means with 95% confidence intervals so we can see the wood for the trees.

We see 2020 and 2021 standing out as we may expect, indicating something rather unpleasant has been going on that has no equal over the last 47 years. The 2019 dip is interesting because it supports the 'tinderbox' observation of Dave Morris, this meaning the elderly and vulnerable population can build in one year to suddenly pass away the next i.e. some of the deaths occurring in 2020 have 'slid' along from 2019. In fact, this alternating pattern of lean and grim years can be seen throughout to greater and lesser extents.



Source: Office for National Statistics. Data to w/b 21st May 2021. \*Standardised wrt 2002 population.



Source: Office for National Statistics, data to 21st May 2021. \*Standardised wrt 2002 population.  
Mean values with 95% confidence intervals

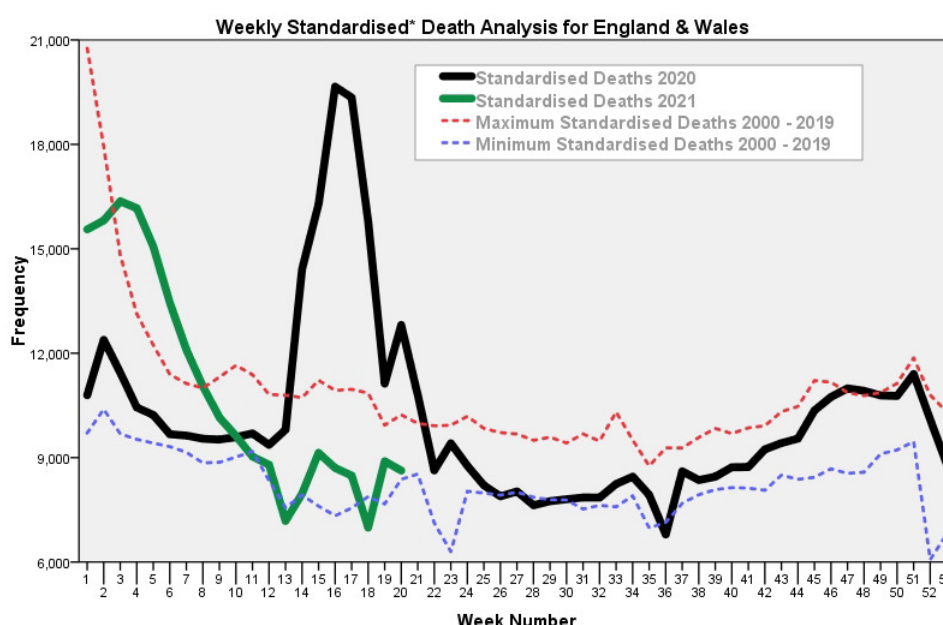
## Weekly Death Analysis Revisited

In my post entitled Weekly Death Analysis I offered a different way of looking at the weekly death count for England & Wales that many found clear and informative. This morning I thought I'd take that analysis for another spin but using my newly developed standardised counts. For an explanation of this please refer to my post entitled Handling The Past.

What it boils down to is standardising weekly counts wrt the 2002 population for England & Wales and is an equivalent transformation to using mortality rates (deaths per 100k population), but with the bonus that we keep to the original units. Another refinement is the addition of week 53 (2020 was a 53-week year) and details of how I tackled this quirk of the calendar can be found in my post entitled Estimating Excess Death.

We had our third troll to date moaning about using old and worthless data from 1970 when medics used leeches. Whilst this unnecessarily aggressive person has been muted and finally booted (I like to roast them slowly whilst still alive) they did give me the idea of presenting an envelope stretching back to just 2000 to see how things stack up over just 22 years. As we can clearly see they stack up pretty much as before, with only week 14 – 20 of 2020 showing any sign of serious bother within the population as a whole.

The huge variation seen for week 1 is down to administrative delays in death registration during the holiday period ("let's do 'em when we get back") rather than anything untoward happening as a result excessive merry-making.



Source: Office for National Statistics, data to 21st May 2021. \*Standardised wrt 2002 population.

## Toward Better Excess Death Estimation

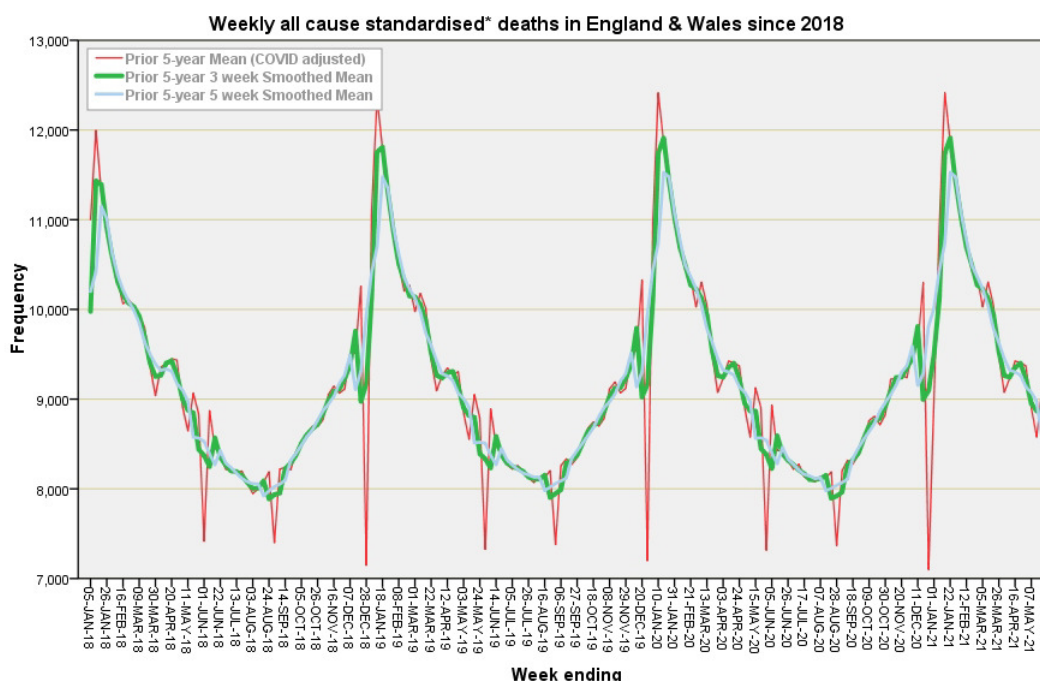
In my post entitled Estimating Excess Death I suggested that excess death estimation arising from COVID/lockdown was an impossible task. I mentioned that the technique favoured by ONS is to rely on the prior 5-year mean death count as a baseline from which deviations may be calculated. In plain English this means taking the observed death count in, say, week 26 of 2020 and subtracting from it the mean count for week 26 for 2019, 2018, 2017, 2016 and 2015.

I grumbled on about the fact that a week-by-week comparison is somewhat artificial when it comes to death and disease, this being compounded by the fact that administrative delays in death registration over holiday periods will seriously mess matters up (some of you are asking why counts leap about; this is why!). On top of that a 'flu season that starts a couple of weeks earlier or later than usual is going to throw a dirty great spanner in the works. The ONS approach to excess death estimation is wonderful on paper but assumes there are no administrative delays and that 'flu always arrives on time: these are people who never get out of the office.



After a bit of pondering I realised I could partially rescue the ONS technique by averaging weekly counts over 3 weeks (current week plus and minus a week) or over 5 weeks (current week plus or minus two weeks) to give administrators and viruses a chance to get their act into gear. The attached slide shows the results of this exercise for w/e 5th Jan 2018 onwards. The red line is the 5-year baseline we obtain using the ONS method exactly as is and the green and blue lines show the impact of ‘smearing’ the data by  $\pm 1$  week and  $\pm 2$  weeks respectively.

See those red spikes sticking out the bottom? Those are due to administrative delays in death registration for week 1 of every year, with staff enjoying drinks and nibbles instead of processing data. See those red spikes sticking out the top? Those are due to admin staff catching up – registration undershoot always leads to overshoot. Ideally ONS would release counts by date of death as a historic weekly series but we can’t be having that! This leaves us the option of adopting 3-week or 5-week smoothed counts as our baseline series with which to estimate excess deaths and I shall be pressing more buttons tomorrow.



Source: Office for National Statistics, data to 21st May 2021. \*Standardised wrt 2002 population.

15<sup>th</sup> June 2021

## Smoothing Death Registration

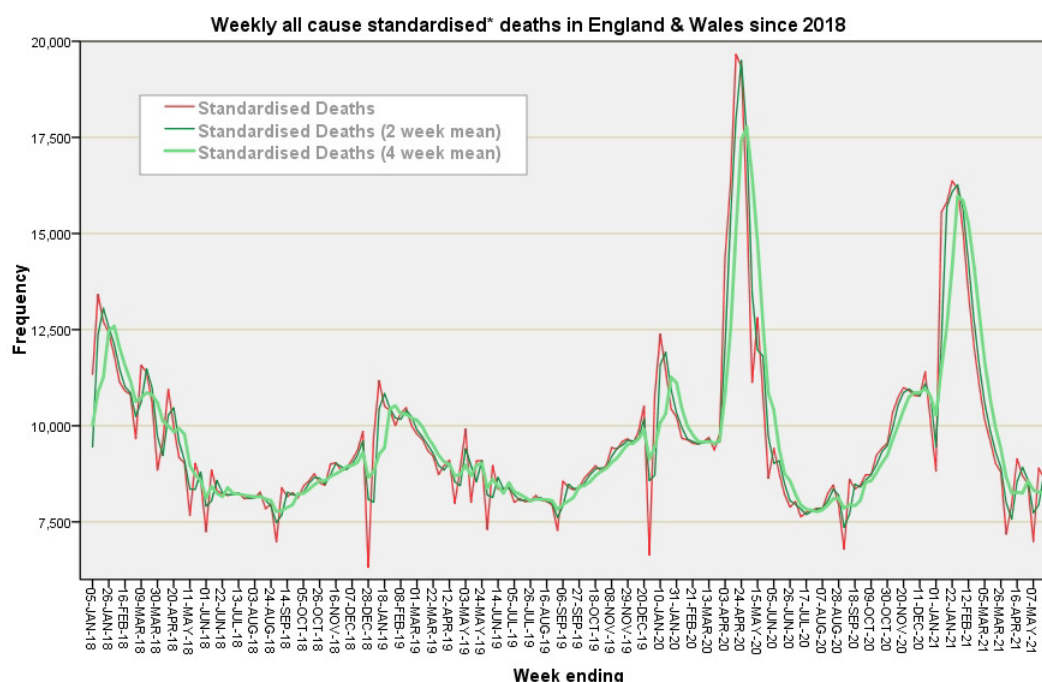
I am hoping by now that folk realise the ONS prefer to publish weekly death counts by date of registration rather than date of death and that this causes an analytical headache, especially when it comes to estimating weekly excess death. In my previous post entitled Toward Better Excess Death Estimation we got to see development of a more reliable historic baseline series through smoothing of weekly data using 3-week and 5-week averaging functions. These series tell us what likely would have happened during 2020 and 2021 across England & Wales if COVID had not come to town. Today we are going to look at what happened when COVID came into town with guns blazing.

We have no idea how long it takes to register and process each death but we can be certain that counts from the preceding week will always spill over into the next week. It is also possible that counts will spill over from the preceding two, three and even four weeks. What I’ve done, therefore, is chosen to average the death count over 2 weeks and 4 weeks in a rolling fashion and see how the series for these stacks up against the declared weekly registered death counts. As before I’m using standardised data, which means counts are adjusted for changes in population over time.

The attach slide now reveals the monstrous peaks arising from the virus and our collective reaction to it. I say ‘collective’ because these peaks are not just about viral death (whether deemed causal – “from” or co-morbid – “with”) but death due to closure of healthcare facilities, isolation of the elderly in nursing and care homes, suicides, domestic violence, drug abuse, alcohol abuse, dangerous discharge, experimental drug treatments, inappropriate early use of ventilators and all the rest of the sorry story.



We can see that smoothing the weekly data in this way irons out some of the quirky red spikes that have come about by administrative delays, with undershoot and overshoot being noticeable during the two festive holiday periods and again during May/August bank holidays. Those unadjusted red spikes will most certainly throw any attempt at excess death estimation as effectively as a banana skin on the pavement.

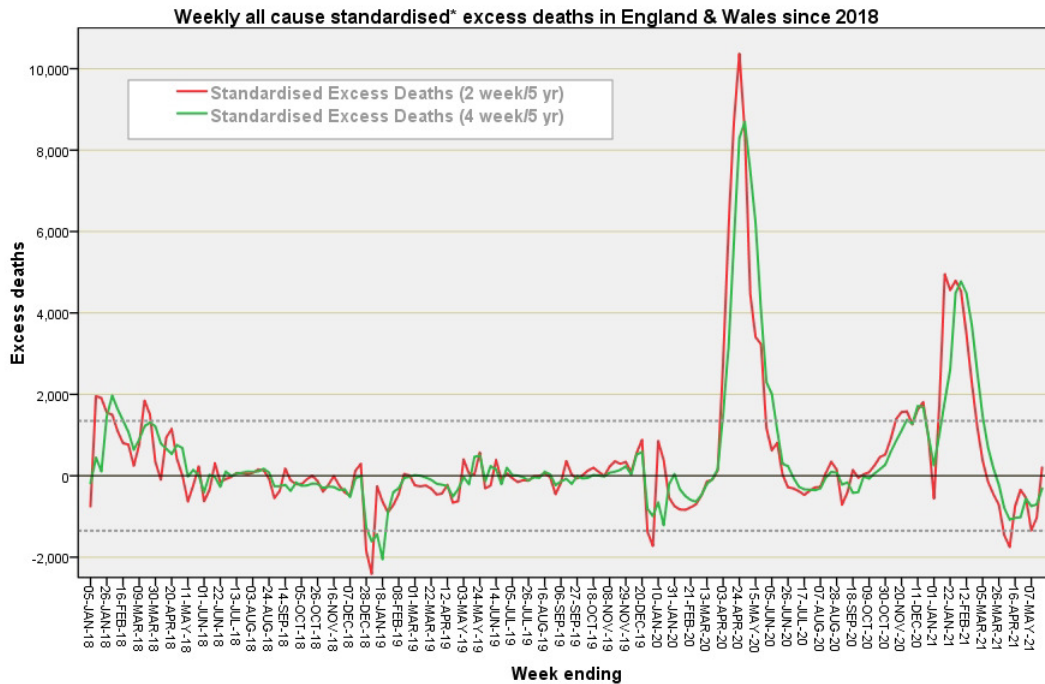


Source: Office for National Statistics, data to 21st May 2021. \*Standardised wrt 2002 population.

## Excess Deaths (including COVID)

Well here it finally is, my estimate of excess weekly all cause standardised death for England & Wales since 2018 using techniques described in my last few posts. As explained in my previous post entitled Smoothing Death Registration the peaks will be due to COVID plus many other factors. The red line denotes registration counts smoothed over two weeks and the green line is the same but smoothed over four weeks to iron out spikes arising from administrative delays. Both series were calculated in relation to the prior 5-year smoothed baselines as explained in my post entitled Toward Better Excess Death Estimation, this being a refinement of the technique favoured by ONS. Please also note that these are standardised estimates of excess death wrt to the 2002 population for England & Wales, so are already adjusted for population growth.

We can see both series chugging along in fairly good agreement, with them hugging the zero axis right up until w/e 3<sup>rd</sup> April 2020. The two dashed lines represent the outer boundary of two standard deviations for the two week series for the pre-pandemic period defined as w/e 5<sup>th</sup> Jan 2019 – 14<sup>th</sup> Feb 2020. Any value lying between these is almost certainly noise. The next step is to remove weekly estimates of COVID causal deaths arrived at using the same techniques and see what we have got left.



17<sup>th</sup> June 2021

### ***Cumulative Standardised Excess Deaths***

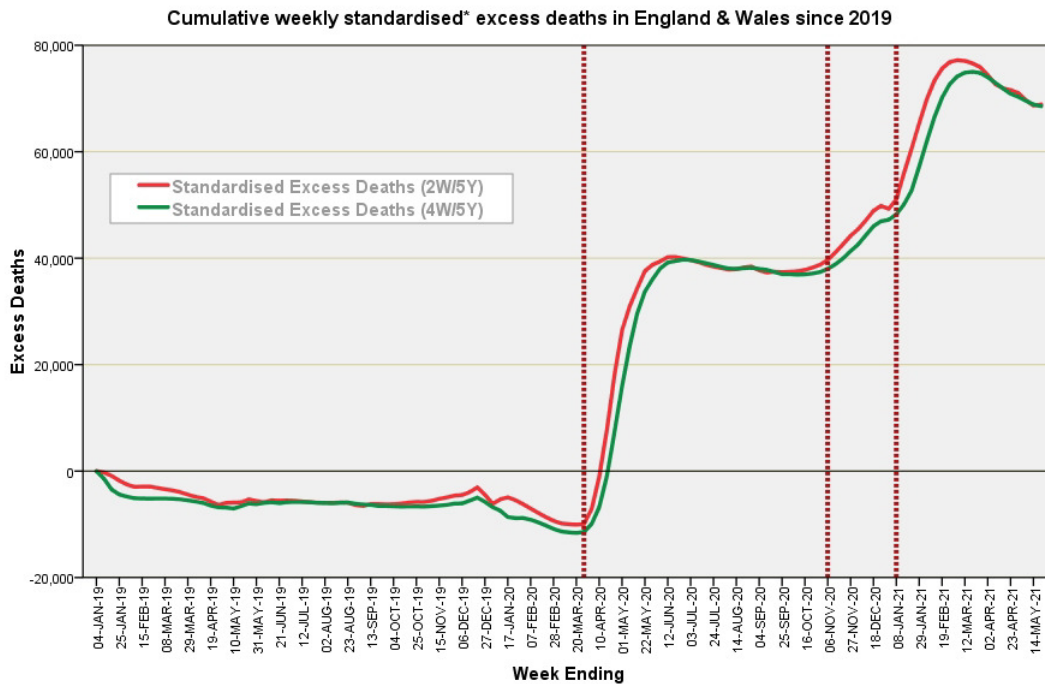
Herewith my estimate of what has been going on. There's a fair bit of number crunching tucked away behind the scenes that I'll summarise briefly as follows:

- Weekly counts of all cause death for England & Wales dating back to 1970 were standardised wrt the population as it stood at 2002.
- A smoothed 5-week rolling mean series (current week  $\pm 2$  weeks) was generated to account for 'flu seasons arriving slightly early or late.
- A prior 5-year mean baseline (5Y) for corresponding week was derived using the smoothed weekly series such that years 2015, 2016, 2017, 2018 and 2019 were used as the baseline for 2020 (and also 2021).
- To allow for delays in registration counts were averaged over the current and previous week (2W series) and over the current and previous 3 weeks (4W series).
- Weekly excess deaths were derived by subtracting the baseline series (5Y) from the averaged 2W and 4W series to yield 2W/5Y and 4W/5Y series.
- Cumulative counts of the 2W/5Y and 4W/5Y excess series were generated with week 1 of 2019 being set to zero excess.

In a nutshell what I'm trying to do here is account for the change in population, account for historic 'flu seasons arriving early or later than usual and account for administrative delays in death registration, especially during holiday periods, the idea being to subtract an averaged 5-year historic count (baseline) from counts observed for corresponding weeks in 2020 and 2021. We then set the cumulative count at the beginning of 2019 to zero and see where we end up.

Where we've ended up is a serious amount of excess death (68,880 deaths). We can see 2019 was a relatively healthy year in that excess death started off negative and stayed that way right through to w/e 10th April. The first national lockdown of 26th March 2020 is marked by the dashed red line, with the subsequent national lockdowns of 5th November 2020 and 6th January 2021.

How much of this excess death is actually due to death COVID, as opposed to draconian and inappropriate policies is going to be difficult to ascertain without consulting the detail held in casenotes and comparing this with the original death certificate. All those in the profession will understand just how fragile the certification process is at the best of times without WHO moving the goalposts and senior managers playing silly buggers.



27<sup>th</sup> June 2021

### ***uniquePeopleTestedBySpecimenDateRollingSum***

This is the variable that is giving me a headache right now. It can be found in the download section of the UK GOV coronavirus dashboard if you select 'Nation' for the area type and scroll right down to the bottom of the Metrics listing (link below). Once the CSV is obtained for all nations you'll need to weed out figures for England since the metric doesn't appear when you select 'England' for area.

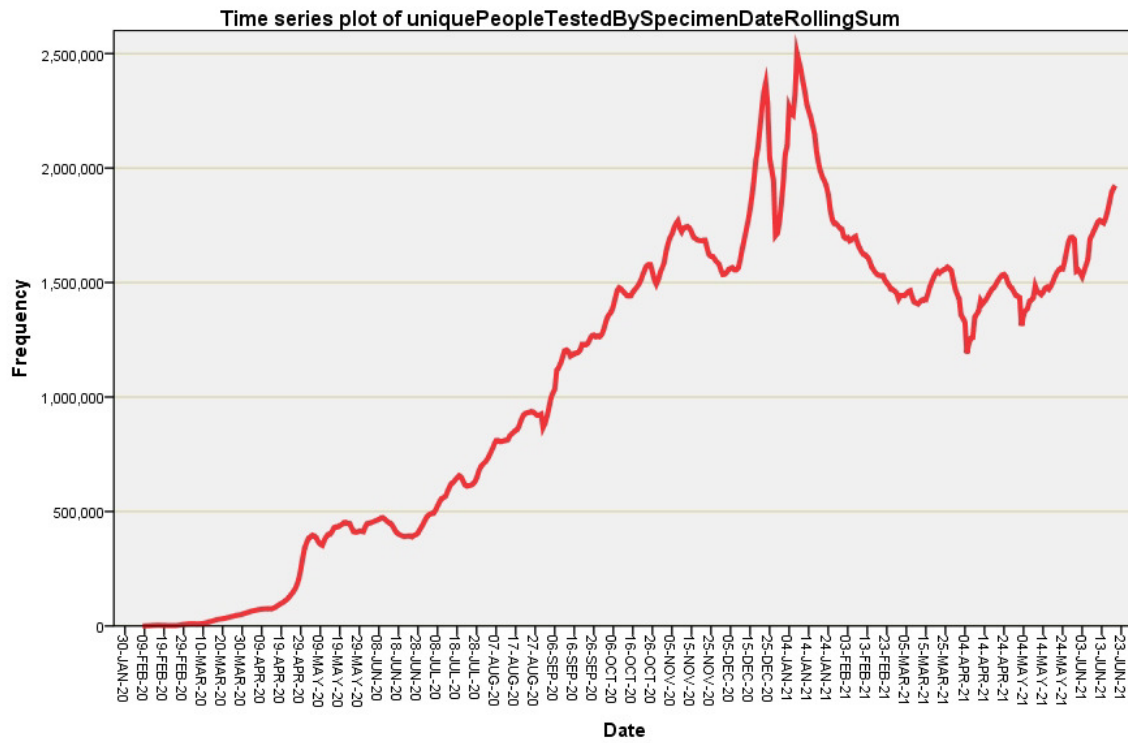
I have checked with the dashboard team that it is what I think it is and it is the unique number of people tested according to the date of the earliest specimen they submitted when summed over the last 7 days, this being a rolling sum. When plotted out it looks innocent enough (slide #1) but when we come to convert it back to the actual daily number of people tested instead of a rolling 7-day sum something wacky happens – we get negative daily counts (slide #2).

In the second slide I have plotted out the daily series with the negative counts as they are (red line) and with the negative counts blanked (green line). You can see that the problem started on 28th December 2020 with a negative daily count of -72,409 people tested. Since then there has been a negative count every 7 days of increasing magnitude. I have triple-checked my calculations and had two people in the dashboard team also scratching their head. Nobody has yet figured out what the heck is going on!

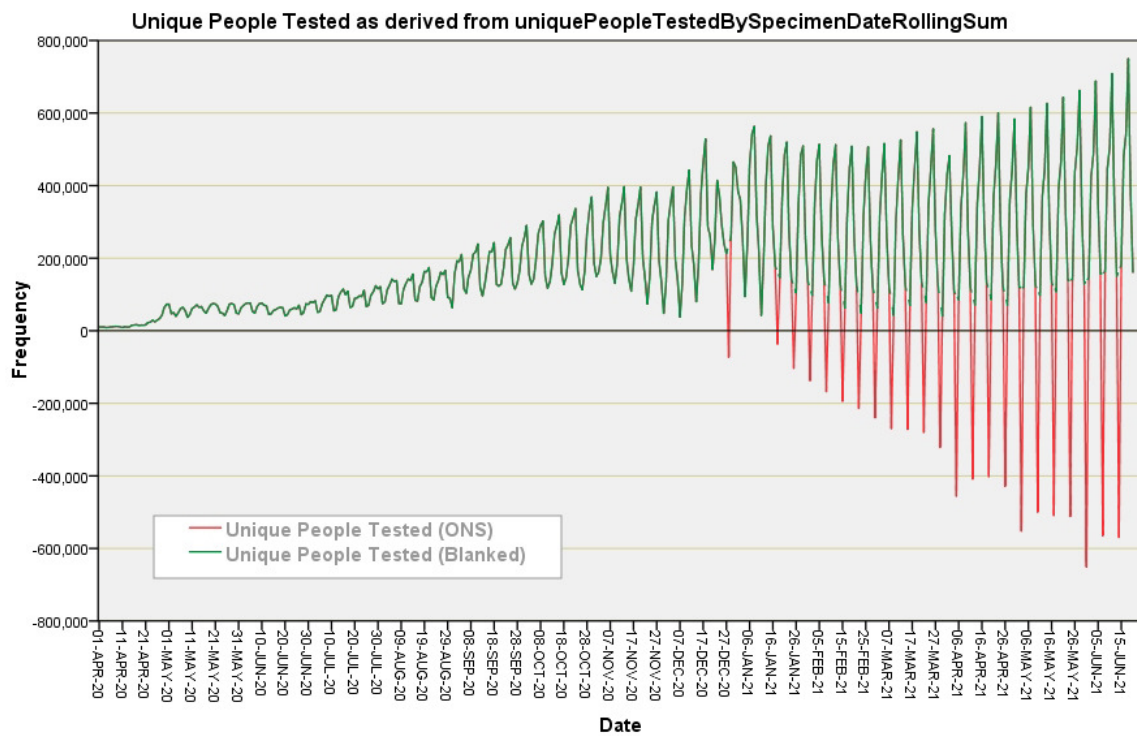
The difference this makes to any and all analysis based on head counts is huge, and is currently standing at a grand total of -7,858,827 – that's 7.9 million negative daily counts for the number of people tested! See that big dip in slide #1 after the Jan peak testing frenzy? That's down to the negative book-keeping entries. My estimate of what the series should look like is given in slide #3 for comparison with officially declared figures. We should note all case rate data that is going to inform policy is based on this tremendous error.

As I have stated in previous posts, the dashboard team asked for y spreadsheet and promised to get back to me. That was 37 days ago.

<https://coronavirus.data.gov.uk/details/download>



Source: UK Government Coronavirus Dashboard, data to 24th June 2021.



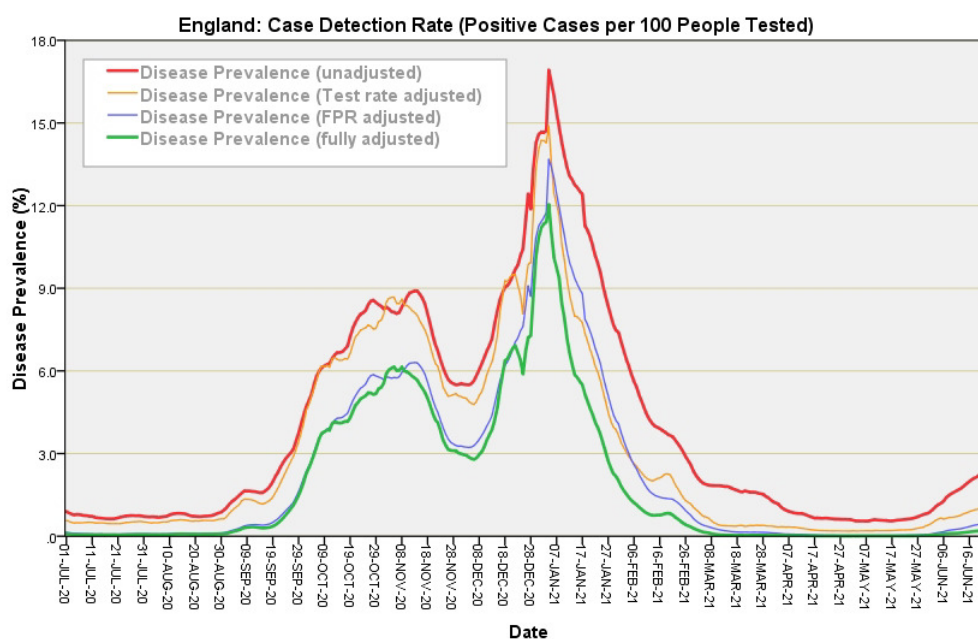
Source: UK Government Coronavirus Dashboard, data to 24th June 2021.

## Case Detection Rate (England)

I've just been updating my databases and thought folk might like to see the latest slide for case detection rates across England. This is a rough proxy for disease prevalence but only a very rough proxy because they are results for people coming forward for testing which is not the same as a random sample.

One way to look at this therefore is disease prevalence among those who submit to testing. Real world (random sample) rates are likely to be at least ten times less.

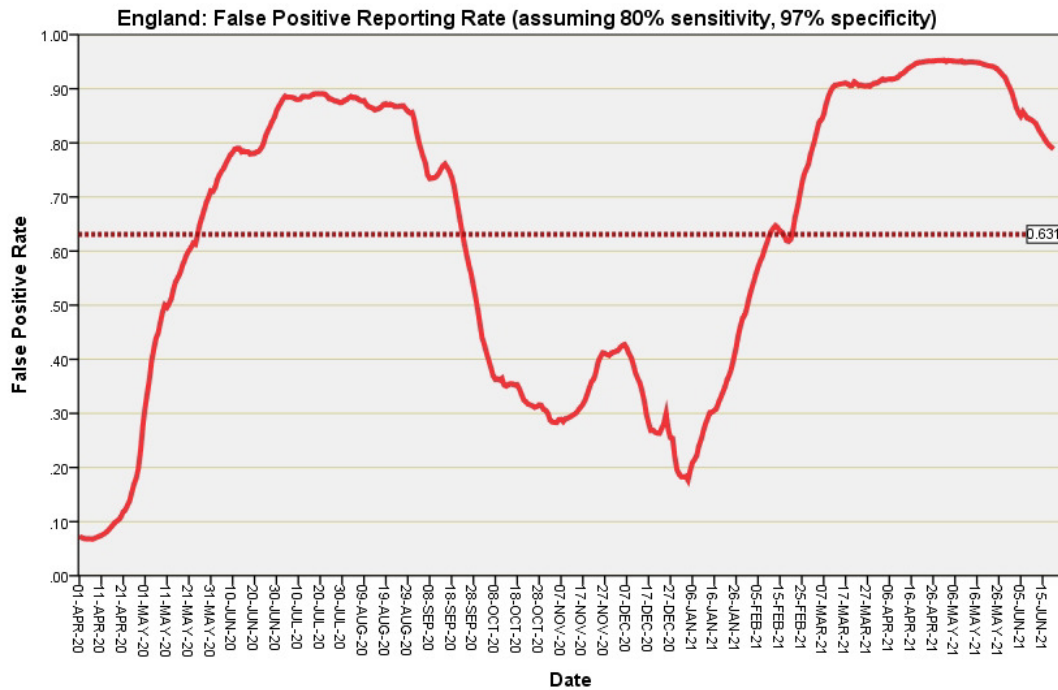
The red line represents the official figure, with varying adjustments for test rate (tests per person are varying over time) and the false positive report rate, with the green line being my all singing, all dancing best estimate for what is actually going on.



## False Positive Reporting Rate

Another updated slide for you all. Overall mean since 1st April is 63.1% false positives, and you can see we've been hitting >90% FPR this spring. That's a lot of hot air for policy makers to blow out of one orifice or another.

I've chosen 97% as a likely real-world specificity instead of the nonsensical nominal (and largely theoretical) 99.9% issued by test manufacturers, this being an educated guess. It shouldn't be a guess - there should be a pile of independent studies telling us precisely what the situation is on the ground but these don't exist. Funny that. So here it is, my best stab at the false positive test truth...



29<sup>th</sup> June 2021

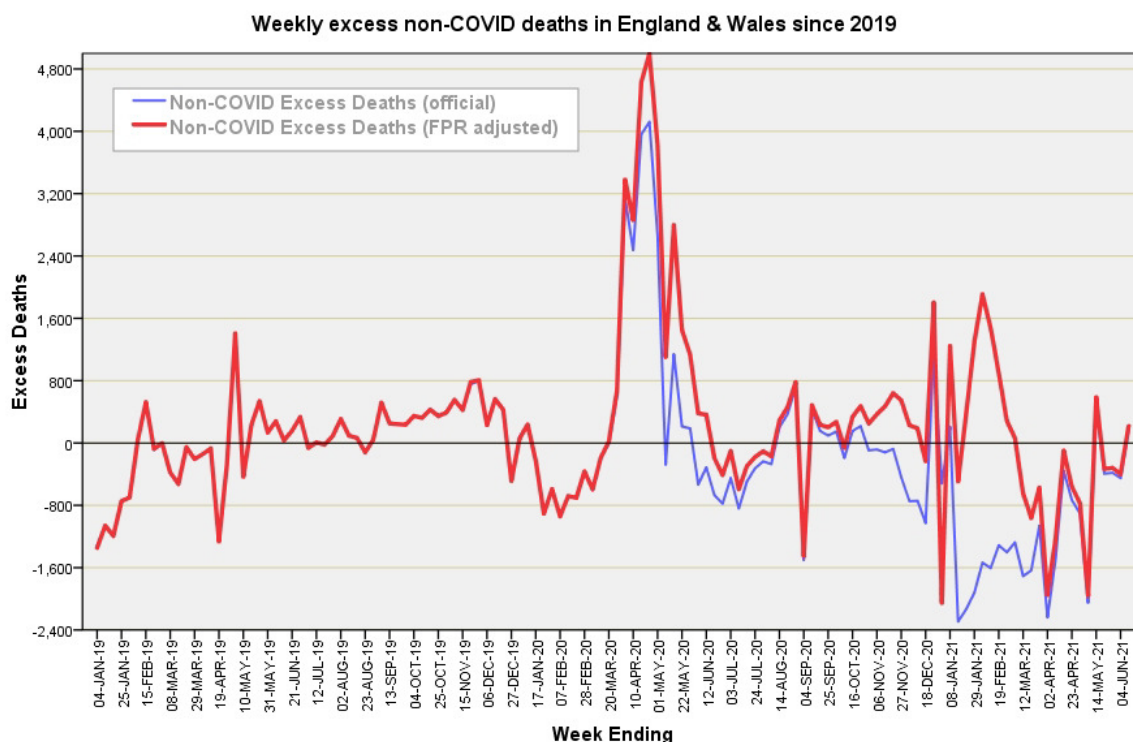
### ***Weekly Excess Non-COVID Deaths***

With discussion in the group once again turning to the issue of false positives I thought it would be useful to adjust weekly counts of alleged COVID death in accordance with the profile revealed in my post entitled False Positive Reporting Rate. Thus, a week where the mean false positive reporting rate was estimated at 80% would have COVID death counts multiplied by a factor of 0.2. With these adjustments made it was then possible to subtract FPR-adjusted COVID deaths from weekly totals for all cause deaths thence to arrive at weekly totals for non-COVID deaths. Weekly excess non-COVID deaths were then estimated by subtracting the prior 5-year mean for all cause death for the corresponding week (a method favoured by ONS). The resulting series reveals excess mortality arising from causes other than COVID, and the graph is rather revealing.

In the attached slide we see the 'official' position using the ONS data as is, and the unofficial position once we make adjustments for false positive COVID death. During the first wave back in April 2020 there is some difference, with the non-COVID death toll a little higher than declared but a bigger difference kicks in May – June 2020 and November 2020.

The biggest difference of all is for the period January – March 2021, where official figures are telling us there was a substantial negative excess for non-COVID death. This is a whopping great porky-pie based on judicious use of false positive test results resulting in miscoding of cases that were never COVID deaths (we may note that post-mortems and inquests for alleged COVID deaths were banned through emergency laws). The stark reality is that we observe a January – March peak in excess non-COVID death, which may well be seasonal influenza and respiratory conditions taking their toll.





Source: Office for National Statistics. Data to w/e 11 Jun 2021.

**30<sup>th</sup> June 2020**

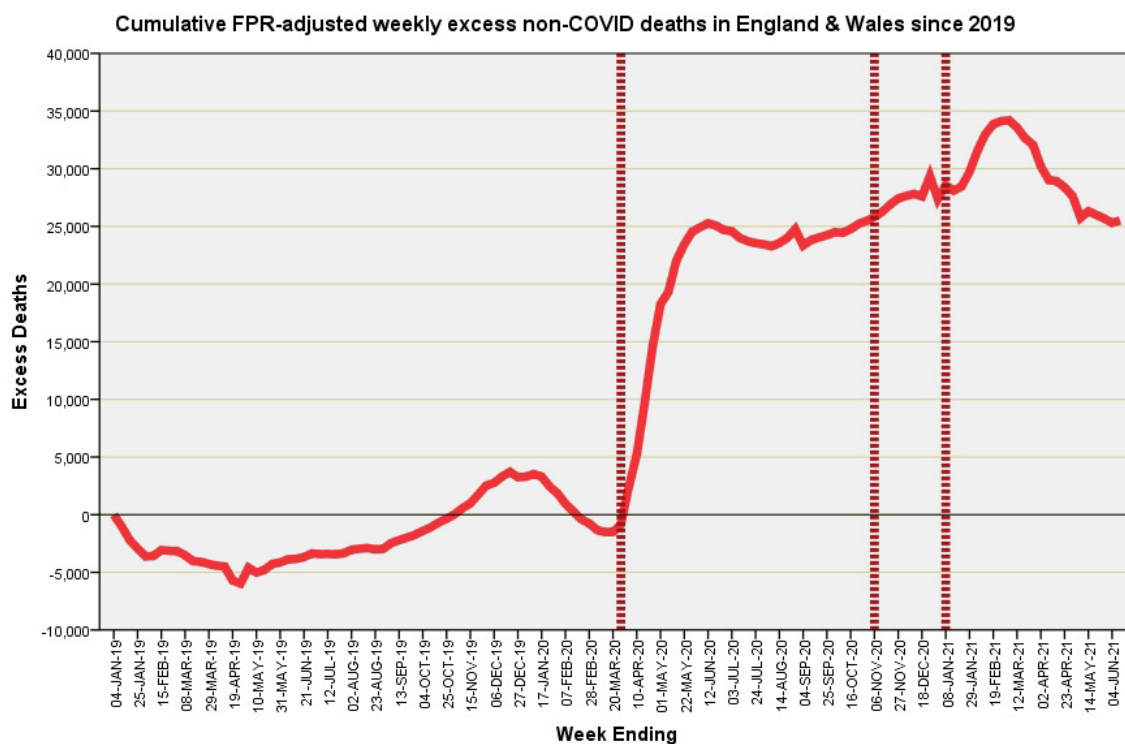
## ***Lockdown Deaths Update***

Yesterday, under a post entitled Weekly Excess Non-COVID Deaths I revealed the steps taken to produce an estimate of excess deaths whilst accounting for the likely false positive reporting rate. We don't actually know what the real world false positive report rate is because nobody has independently verified operational test sensitivity and specificity that is to be found in the various labs up and down the country – all we have are bench-marking claims by the test manufacturer that are based on supposition using a synthesised genome (they still haven't produced a purified viral sample; a viral 'isolate' yes, but this isn't the same thing).

If we take the nominal sensitivity of 80%, a likely real world specificity of 97% (this is being generous) and a disease prevalence of 0.1% (last official estimate by the REACT study bods) then any medical calculator will reveal a false positive rate of 97.4%. In my post False Positive Reporting Rate I take this calculation a little further by showing how this has varied over time and it is this curve that has been used to adjust counts of alleged COVID death. This morning I am going to take the time series from Weekly Excess Non-COVID Deaths and convert this into an accumulated daily figure.

We now see the curve hugging the zero axis for 2019 before rocketing to an excess of 25,000 non-COVID deaths shortly after w/e 20th March 2020, with a further climb to a peak of 34,198 for w/e 5th March 2021. I call these 'lockdown deaths' because they are not due to COVID and they are not due to seasonal 'flu, both of which have been accounted for.

Because of their peculiar persistence these are excess deaths we may attribute to the government's continued policies, and with the cumulative total still sitting at close to 25,000 we can see nothing much has changed. Incidentally, when Sheffield and Loughborough universities did a similar study last summer they estimated 21,000 lockdown deaths, so my figures are in good company.



Source: Office for National Statistics. Data to w/e 11 Jun 2021. National lockdowns marked by dashed lines

# John Dee, His Almanac

1<sup>st</sup> July 2021

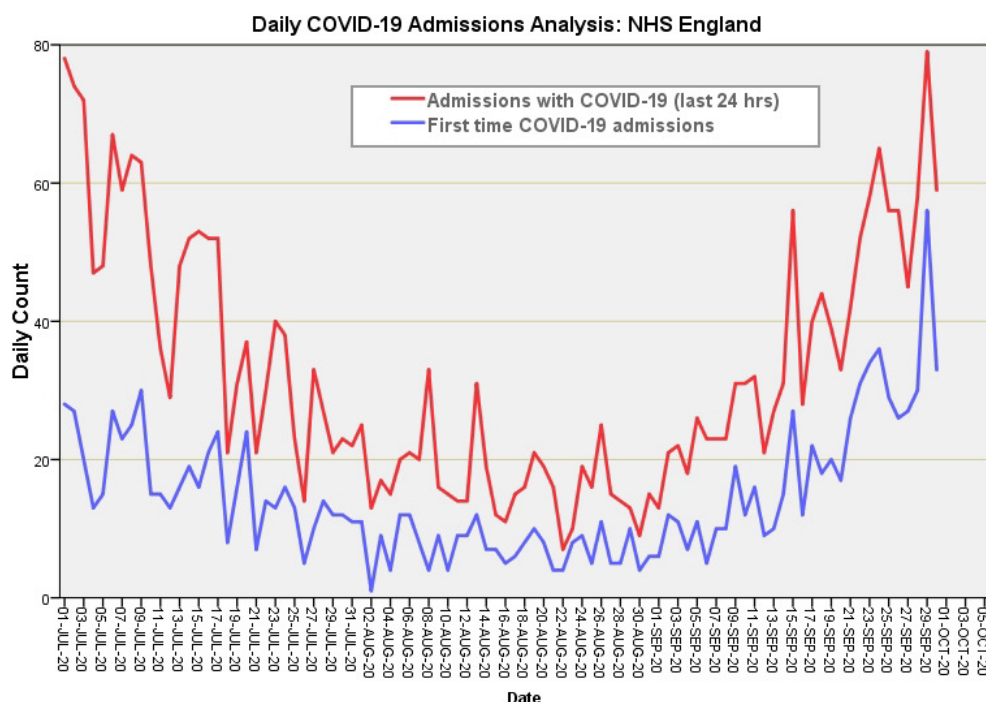
## Cooking Up A Feast

I am in the process of updating my admissions and bed occupancy database for all 315 service providers that go to make up NHS England. Once done I'll start serving some hot and tasty results.

One variable that the NHS data authorities have notably dropped is the daily count of first time COVID admissions. Yes indeed, any and all admissions and re-admissions are counted, which means somebody who goes for regular treatment who happens to test positive will dial up a stack of counts!

Back in October 2020 a NHS hospitals activity spreadsheet named Covid-Publication-08-10-2020v2.xlsx possessed this info in a tab called 'Admissions First' - two days later the spreadsheet had been named Covid-Publication-08-10-2020v3.xlsx and the truth-telling tab had disappeared; everything else was identical. I just so happened to have intercepted the switch through sheer luck; that's the sort of game they're playing and I'm sitting on the archived proof.

Last time I looked at this little wrinkle I discovered a median of 2.3 admissions per individual, so halve the published counts and you'll get closer to admission reality. I attach the original slide that accompanied this and will now go turn the oven on to bake some more...



Source: <https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-hospital-activity/>

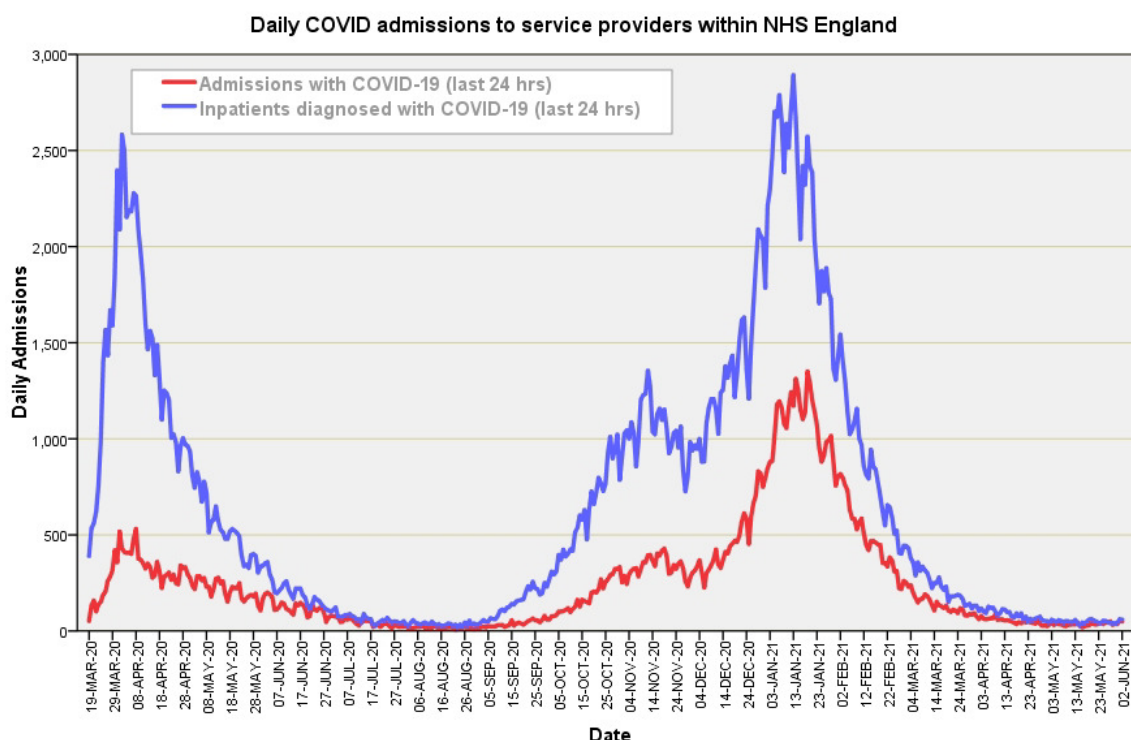
## COVID is Not A Front Door Disease

I said this in a thread a while back and somebody asked what I meant. What I mean is that, despite the mainstream media's portrayal of the pandemic, folk are not dropping like flies on the streets and being rushed into hospital with sirens blaring. Chances are they are already in hospital waiting for a hip operation – if they test positive at any point during their stay the date of the test counts as a new date of 'admission' and they suddenly become a COVID case rather than a hip replacement case.

We know this because: A. The definition of an admission provided on the UK GOV coronavirus dashboard clearly states they count inpatients who test positive (take a look in the 'about' section); B. NHS activity datafiles that are readily obtainable from their web provide daily counts of admissions proper and inpatient 'admissions'. In the slide below you get to see this information.

We now see that the majority of COVID cases are not coming in through the ‘front door’ as the press claim (red line) but are detected whilst already in hospital for other reasons (blue line).

Please also don’t make the mistake of thinking those red line admissions are people coming in to hospital because they are sick with COVID! Anybody being admitted to hospital for any reason whatsoever will count as a COVID admission if they test positive. Yes, it’s that daft. Neither does the admitting hospital have to be a place where COVID is treated, which is why I’ve used ‘service provider’ in the slide title rather than hospital. Thus a healthy 24-year-old pregnant woman being admitted to give birth will count as a COVID admission if she tests positive. The same goes for an elderly gentleman with chronic kidney disease requiring dialysis (and his later re-admission will also count).



Source: <https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-hospital-activity/>

## Proportion of Front Door Admissions

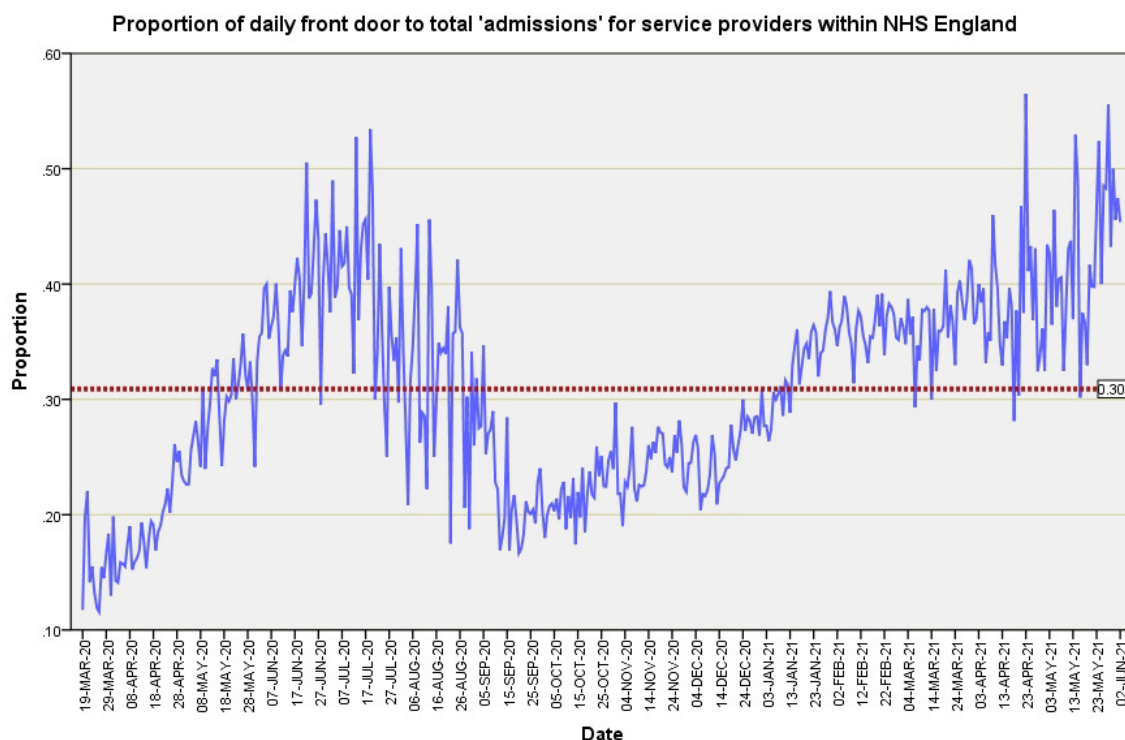
*The key take home message here is that when hospitals get busy during the winter months then ‘front door’ COVID falls away; those ‘waves’ are inpatients already in hospital for other reasons.*

In my previous post entitled COVID is Not A Front Door Disease we got to see that COVID is not a ‘front door’ disease (does what it says on the tin). For this next slide I’ve taken the same data and calculated the proportion of bone fide front door COVID admissions to all declared COVID admissions for the service providers that make up NHS England. There are several features of interest.

We may note that genuine COVID admissions only ever account for around 0.50 (50%) of the provider COVID caseload at most, this dropping to 0.20 (20%) or even 0.10 (10%), the average being 0.309 (30.9% - dashed line). We may also note that peak front door COVID admission coincides with the summer months when hospital activity is generally at its quietest. During the busy months of winter 2020/21 the proportion of COVID front door to all COVID cases bobbed around the 0.25 – 0.30 mark (25% - 30%) at a time when the government was dishing out scary second wave stats.

We now see that the so-called ‘second wave’ was an inpatient affair, as was the ‘first wave’ with folk no doubt already in hospital for chronic and other respiratory conditions that were once upon a time called ‘seasonal.’

We may note that the NHS data authorities don’t like to provide daily admission data for non-COVID cases within their datafiles; non-COVID beds yes but admissions not. I think we can guess why!



Source: <https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-hospital-activity/>

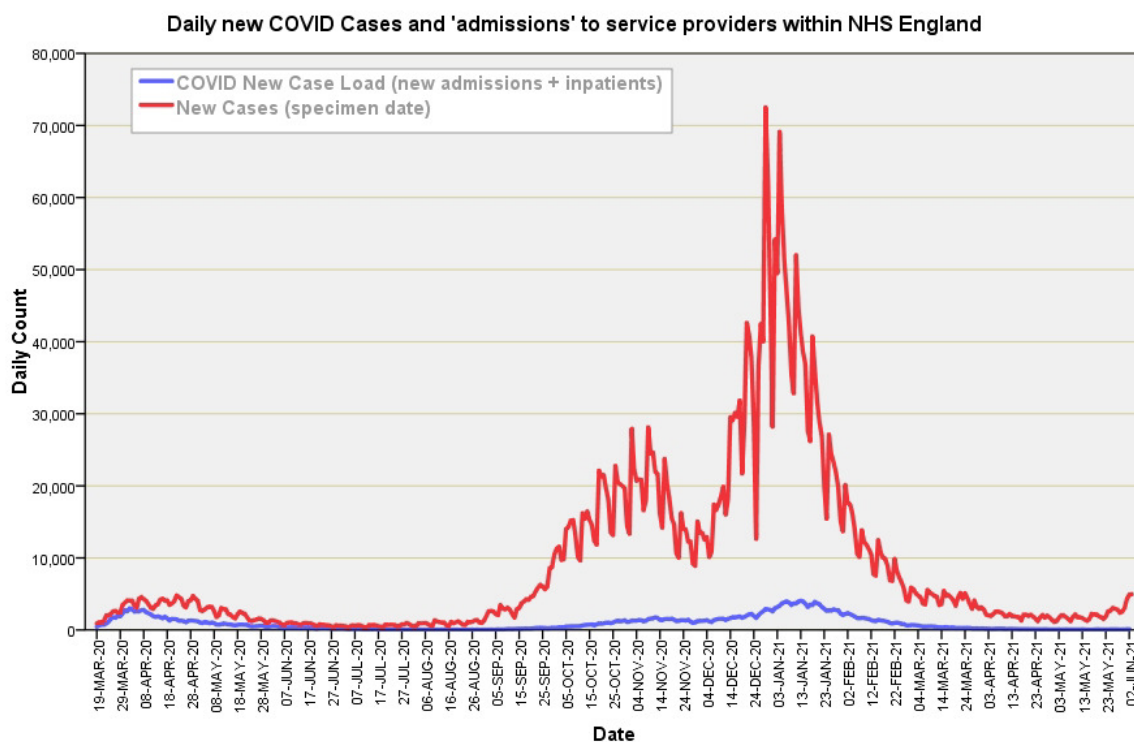
**2<sup>nd</sup> July 2021**

### ***COVID Cases & Hospital Admissions***

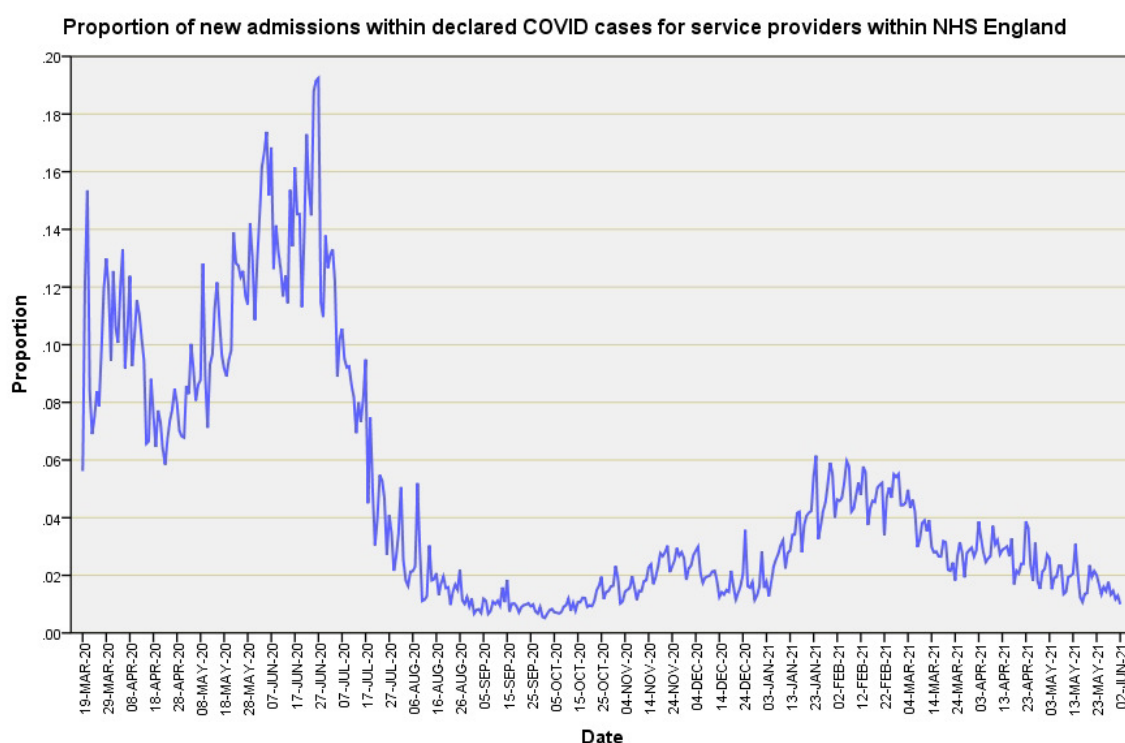
This morning I thought I'd kick off by putting another urban myth to rest, this being the myth of COVID cases requiring hospitalisation. This is generally not so as we may see from the first slide below. In red corner we have the UK government's declared COVID case count (though these are merely positive swab results and not medical cases proper) and in the blue corner we have the number of COVID cases either going in through the front door (admissions proper) or being detected whilst already in a ward somewhere (inpatients being re-cycled as 'admissions'). Though hard to judge because of the scale, we may observe a close correspondence back in March/April 2020 and that's about it. After that we see lots and lots of cases who never ended up in hospital one way or other.

In the second slide I have used this data to derive the likelihood of a declared COVID case going in to hospital through the front door (admission proper). A peak proportion of 0.192 (19.2%) was reached on 27<sup>th</sup> June 2020 when 97 admissions across NHS England were made for a declared case count of 504 during a rather splendid summer. To put that 504 into context it is worth noting this count sits amongst the ten lowest counts since records began, the highest count being 72,510 which was declared on 29<sup>th</sup> December 2020. The chances of these 504 being all false positives are rather high indeed, as are the chances for those 97 – we shall never know why they ended up in hospital.

During the so-called 'second wave' of the 2020/21 winter season we find the proportion bobbing around 0.020 – 0.050, that is to say between 2% and 5% of declared cases made their way into hospital for one reason or another during the peak of the deadly second wave, which may be compared to 19.2% during summer frolicking. This is all supposed to make epidemiological sense; perhaps if I downed a few bottles of cold beer with tequila chasers and wore an edible taco hat, then it would.



Source: <https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-hospital-activity/>



Source: <https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-hospital-activity/>

### ***COVID Cases & Hospital Admissions (Rates)***

Following on from my previous post I thought I'd glance at the scatterplot for front door admissions vs. declared COVID cases to see if it revealed anything of interest. It does, especially when you colour code the dots according to year and season. I shall draw your attention to the mass of lighter green blobs down in the bottom left hand corner that cover the period March – May 2020 – compare these to the mass of darker green blobs sitting down and slightly to their right that cover the period March – May 2021. Sitting down and to the right means many

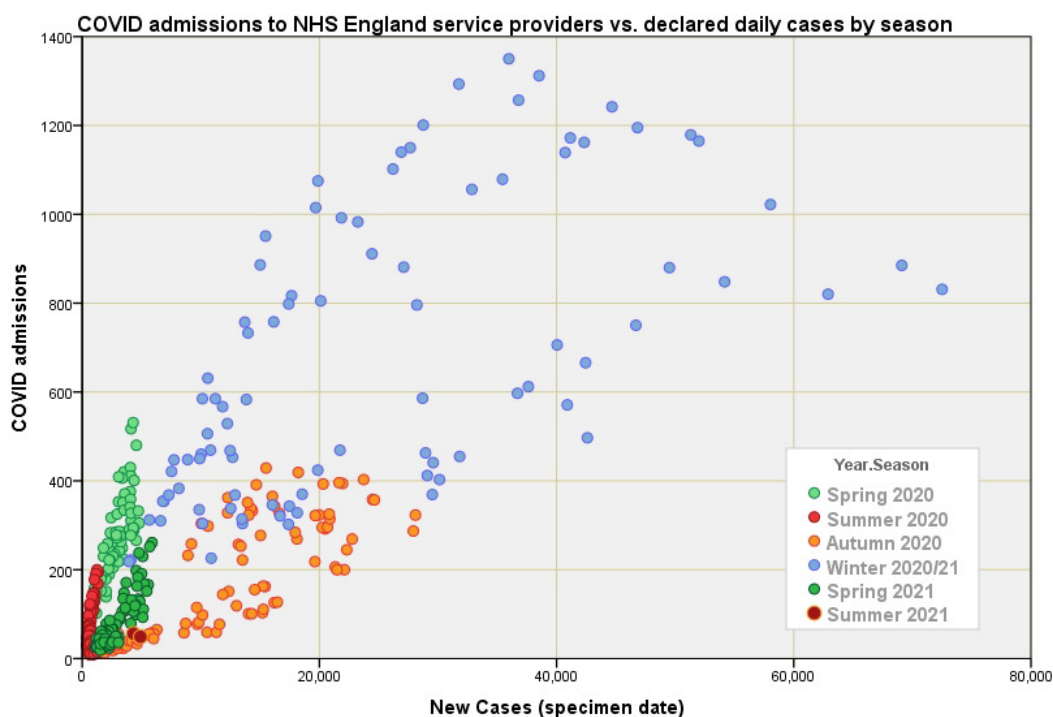


more declared COVID cases, yet less being admitted to hospital. We may conclude that either the virus is getting weaker or the tests are becoming even more unreliable. Then again it might just be the vaccine doing its thing! The same shift down and right can be seen for the first two blob-days of summer 2021 when compared to the lighter red blobs for summer 2020.

Another interesting feature is how the slope of the lighter red (summer 2020) and light green (spring 2020) data clouds are steeper than the slopes for autumn 2020 and winter 2020 – the virus meant business back then despite smaller number of cases overall during the first ‘wave’. The huge scatter for winter 2020/21 is also interesting and I would suggest is a sign of tests that are not fit for purpose or a virus that can’t make up its mind. If the pandemic is real in terms of genuine and serious health impact and viral genome testing is as reliable as claimed then we’d see tighter relationships between declared cases and hospital admissions rather than fuzzy data clouds, spring 2020 being a good example.

Being the numerical nerd that I am I could not resist putting this data through generalised linear modelling (GLM) to see what admission rate point estimates may be obtained for the differing periods using a Poisson identity function with scaled deviance. I shall set aside copious amounts of statistical output and get straight in with 0.093 (9.3%) admissions per declared case for spring 2020, 0.074 (7.4%) admissions per declared case for summer 2020, 0.015 (1.5%) admissions per declared case for autumn 2020, 0.027 (2.7%) admissions per declared case for winter 2020/21 and 0.028 (2.8%) admissions declared per case for spring 2021.

Whatever danger was lurking back in the early part of 2020 is clearly no longer lurking to the same extent despite all the media spin - either that or we are seeing benefits of vaccination. Then again it could be a raft of other confounding factors! If I can find the time I'll 'normalise' this data for false positive reporting and PCR test bias - level the playing field so as to speak.



Source: NHS England; UK GOV coronavirus dashboard, data period 19/3/20 - 3/6/21

3<sup>rd</sup> July 2021

## A Better Handle On Disease Prevalence

Disease prevalence is simply a posh term for the proportion of the population who are thought to be infected with a disease, such that 10% means 1 in 10 folk are infected and 1% means 1 in 100 folk are infected. BTW being infected with something doesn't mean that you are infectious – that's another story for another day.

Aside from being a key epidemiological measure in its own right disease prevalence is one of the three ingredients needed to estimate the false positive rate, the other two being test sensitivity and test specificity, these being measures that are derived through benchmarking, quality control and lab assay. Generally speaking the false positive reporting rate (FPR) increases as disease prevalence decreases because the number of true positives will be in decline, making any false positives stick out like a sore thumb.

Disease prevalence comprises two key ingredients, these being the number of cases and the number of people tested. Obtaining daily counts of the number of people tested has been a right old headache since this important information doesn't appear on the UK GOV coronavirus dashboard as we expect it might; it is the single most useful epidemiological measure that the UK government, in its boundless wisdom, has somehow overlooked.

A breakthrough came in May 2021 when I discovered an undefined variable down in the download section of the dashboard called `uniquePeopleTestedBySpecimenDateRollingSum` that appeared to provide the answer. A peculiar story then unfolded with the discovery of negative daily counts being entered into the datafile every Monday morning, and the dashboard team ignoring my request for clarification.

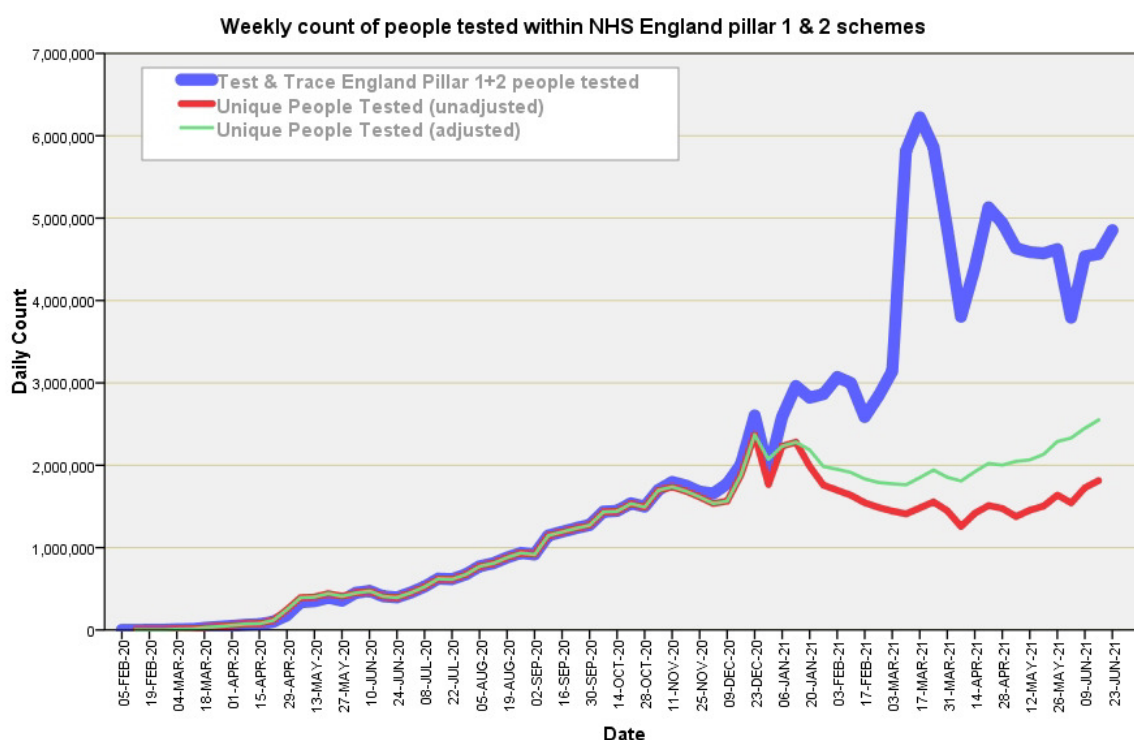
I assumed these were book-keeping attempts to remove counts of people who had been tested the week before that had been tested prior to obtain true test uniqueness – a singularly pointless variable!

Using statistical modelling I estimated what the negative entry counts should have been in order to put missing folk back so I could calculate disease prevalence, thence to calculate the false positive rate over time, thence to provide slides of FPR-adjusted data.

Today I decided to double-check my modelling by downloading weekly datafiles held in the NHS Test & Trace system, then converting my daily count series to the rather weird Test & Trace weekly count that runs Thursday to Wednesday each week. After a fair bit of fiddling I fetched-up with this immensely satisfying slide.

We now see the dashboard unadjusted data (red line), my adjustment to this (green line) and the official test & trace head count (blue line) all agreeing beautifully right up to the introduction of lateral flow kits in December 2020. After this the three series diverge markedly, with my estimates getting nowhere near the numbers of people who received a test in recent months. This means I have greatly over-estimated disease prevalence and greatly under-estimated false positive rate from December onward – I can't wait to see what transpires!

If we ponder on this slide we will also come to the conclusion that the dashboard series labelled 'unique people' didn't really mean unique people up to December 2020 but did so afterwards. This is the kind of curveball that the data authorities are throwing as often as they can, presumably to stop analysts like myself from spilling the beans.



Source: NHS England, UK GOV coronavirus dashboard

## EudraVigilance Monthly Update

I've just undertaken my regular monthly analysis of adverse reactions logged within the European database for suspected adverse drug reactions for the four primary COVID biological products licensed for emergency (Moderna, Pfizer, AstraZeneca and J&J biological products).

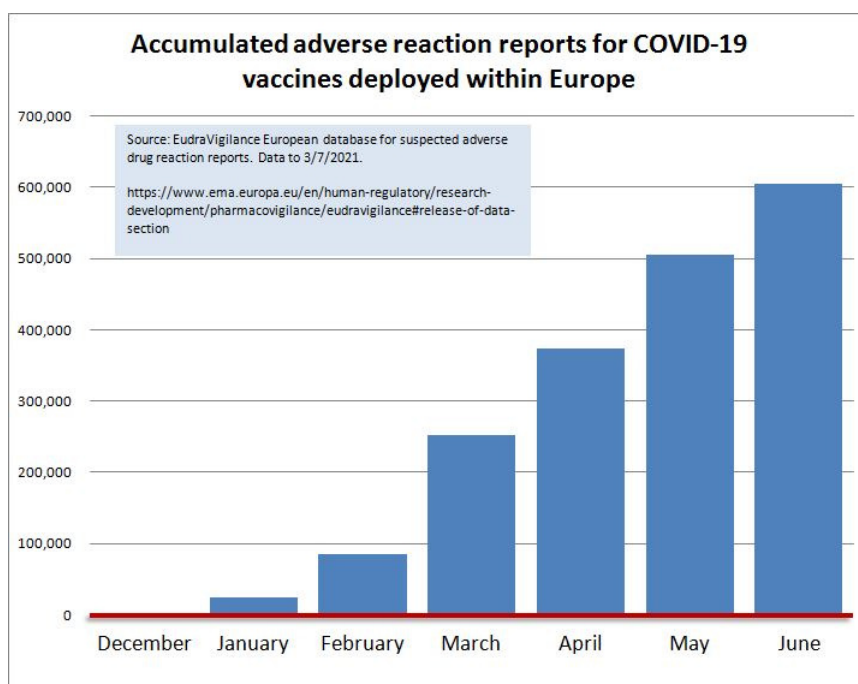
As you study these figures it is worth noting that they are by no means comprehensive, with audits suggesting 1% - 10% data capture at best. I have received several personal communications indicating vaccinated folk are reluctant to acknowledge symptoms let alone report them, and there is concern amongst colleagues that the medical profession is dragging its feet. Both of these behaviours endanger the very alarm system put in place to ensure public safety.

As at 3<sup>rd</sup> July 2021 EudraVigilance reports 17,503 deaths among 665,525 individuals who have reported adverse reactions post-vaccination. Accumulated monthly counts continue to rise at a near linear rate estimated at 115,401 reports per month ( $p < 0.001$ ; 95% confidence interval = 101,238; 129,565).

The European Centre for Disease Control (ECDC) reports 167,071,944 vaccinated individuals for the same period, thus returning an adverse incident report rate of 0.400% (665,525/167,071,944) and a fatal report rate of 0.010% (17,503/167,071,944) for all four biological products. A total of 1,720,084 adverse reactions were suffered by the 665,525 individuals concerned, indicating an average of 2.58 post-vaccination events per case. Of these 870,145 (50.6%) were categorised as serious, with 849,939 (49.4%) categorised as non-serious.

As I have stated in previous reports, the sheer and unprecedented volume of adverse incidents should be of major concern to all authorities as well as all medical practitioners, with mounting serious and fatal reactions likely to swamp already stretched healthcare services across Europe. Breakdowns for these top line figures may be found in the attached charts.

| As at 3rd July | Total Adverse Reports | Total deaths | Adverse report fatality rate | People receiving vaccine | Post-vaccination adverse report rate | Post-vaccination death rate |
|----------------|-----------------------|--------------|------------------------------|--------------------------|--------------------------------------|-----------------------------|
| Moderna        | 63,155                | 4,605        | 7.3%                         | 16,145,232               | 0.391%                               | 0.029%                      |
| Pfizer         | 269,640               | 8,426        | 3.1%                         | 113,008,852              | 0.239%                               | 0.007%                      |
| AstraZeneca    | 317,503               | 3,871        | 1.2%                         | 33,477,246               | 0.948%                               | 0.012%                      |
| Janssen        | 15,227                | 601          | 3.9%                         | 4,440,615                | 0.343%                               | 0.014%                      |
| Total          | 665,525               | 17,503       | 2.6%                         | 167,071,944              | 0.400%                               | 0.010%                      |



### Fatal Reactions Following COVID-19 Vaccination by Product

| Accumulated Raw Counts            |         |        |             |         |        |
|-----------------------------------|---------|--------|-------------|---------|--------|
| As at 3rd July                    | Moderna | Pfizer | AstraZeneca | Janssen | Total  |
| Blood & lymphatic system          | 35      | 99     | 160         | 18      | 312    |
| Cardiac                           | 503     | 1,165  | 454         | 73      | 2,195  |
| Congenital                        | 4       | 12     | 3           | 0       | 19     |
| Ear & labyrinth                   | 0       | 5      | 0           | 0       | 5      |
| Endocrine                         | 1       | 2      | 3           | 1       | 7      |
| Eye                               | 9       | 19     | 15          | 3       | 46     |
| Gastrointestinal                  | 161     | 388    | 184         | 25      | 758    |
| General & administration site     | 1,928   | 2,510  | 1,009       | 150     | 5,597  |
| Hepatobiliary                     | 17      | 33     | 32          | 4       | 86     |
| Immune system                     | 5       | 42     | 14          | 1       | 62     |
| Infections & infestations         | 259     | 834    | 247         | 16      | 1,356  |
| Injury, poisoning & complication  | 92      | 124    | 94          | 8       | 318    |
| Medical Investigations            | 93      | 296    | 88          | 39      | 516    |
| Metabolism & nutritional          | 94      | 164    | 50          | 11      | 319    |
| Musculoskeletal                   | 88      | 103    | 50          | 17      | 258    |
| Neoplasms                         | 18      | 26     | 9           | 0       | 53     |
| Nervous system                    | 465     | 902    | 612         | 76      | 2,055  |
| Pregnancy, puerperium & perinatal | 2       | 18     | 5           | 1       | 26     |
| Product issues                    | 0       | 0      | 0           | 0       | 0      |
| Psychiatric                       | 75      | 117    | 33          | 5       | 230    |
| Renal & urinary                   | 66      | 132    | 33          | 8       | 239    |
| Reproductive & breast             | 2       | 2      | 0           | 1       | 5      |
| Respiratory & thoracic            | 438     | 989    | 447         | 47      | 1,921  |
| Skin & subcutaneous tissue        | 32      | 79     | 25          | 2       | 138    |
| Social circumstances              | 16      | 12     | 5           | 3       | 36     |
| Surgical & medical procedures     | 42      | 21     | 16          | 27      | 106    |
| Vascular                          | 160     | 332    | 283         | 65      | 840    |
| Total                             | 4,605   | 8,426  | 3,871       | 601     | 17,503 |

Source: EudraVigilance European database for suspected adverse drug reaction reports

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

### Serious Reactions Following COVID-19 Vaccination by Product

| Accumulated Raw Counts            |         |         |             |         |         |
|-----------------------------------|---------|---------|-------------|---------|---------|
| As at 3rd July                    | Moderna | Pfizer  | AstraZeneca | Janssen | Total   |
| Blood & lymphatic system          | 1,312   | 6,133   | 6,642       | 259     | 14,346  |
| Cardiac                           | 3,959   | 10,621  | 8,812       | 490     | 23,882  |
| Congenital                        | 0       | 0       | 0           | 16      | 16      |
| Ear & labyrinth                   | 1,559   | 4,231   | 6,468       | 120     | 12,378  |
| Endocrine                         | 100     | 264     | 280         | 0       | 644     |
| Eye                               | 2,054   | 5,647   | 9,820       | 305     | 17,826  |
| Gastrointestinal                  | 6,940   | 22,796  | 49,742      | 781     | 80,259  |
| General & administration site     | 17,129  | 53,355  | 109,065     | 2,206   | 181,755 |
| Hepatobiliary                     | 263     | 488     | 531         | 53      | 1,335   |
| Immune system                     | 1,183   | 6,075   | 2,731       | 140     | 10,129  |
| Infections & infestations         | 4,022   | 13,246  | 13,315      | 433     | 31,016  |
| Injury, poisoning & complication  | 3,030   | 5,688   | 5,312       | 319     | 14,349  |
| Medical Investigations            | 2,027   | 8,929   | 9,143       | 1,536   | 21,635  |
| Metabolism & nutritional          | 1,375   | 3,150   | 7,321       | 143     | 11,989  |
| Musculoskeletal                   | 6,952   | 25,105  | 59,368      | 1,157   | 92,582  |
| Neoplasms                         | 173     | 358     | 291         | 17      | 839     |
| Nervous system                    | 16,182  | 45,420  | 99,194      | 2,149   | 162,945 |
| Pregnancy, puerperium & perinatal | 336     | 455     | 239         | 15      | 1,045   |
| Product issues                    | 0       | 0       | 0           | 0       | 0       |
| Psychiatric                       | 2,770   | 6,702   | 11,414      | 281     | 21,167  |
| Renal & urinary                   | 978     | 1,527   | 2,088       | 116     | 4,709   |
| Reproductive & breast             | 500     | 2,272   | 4,705       | 91      | 7,568   |
| Respiratory & thoracic            | 6,109   | 18,185  | 20,215      | 963     | 45,472  |
| Skin & subcutaneous tissue        | 4,939   | 15,210  | 25,160      | 426     | 45,735  |
| Social circumstances              | 663     | 818     | 541         | 77      | 2,099   |
| Surgical & medical procedures     | 525     | 233     | 569         | 391     | 1,718   |
| Vascular                          | 3,886   | 44,445  | 13,028      | 1,348   | 62,707  |
| Total                             | 88,966  | 301,353 | 465,994     | 13,832  | 870,145 |
| Serious to non-serious ratio      | 1.29    | 0.83    | 1.21        | 0.45    | 1.02    |

Source: EudraVigilance European database for suspected adverse drug reaction reports

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>



### Non Serious Reactions Following COVID-19 Vaccination by Product

| As at 3rd July                    | Accumulated Raw Counts |         |             |         |         |
|-----------------------------------|------------------------|---------|-------------|---------|---------|
|                                   | Moderna                | Pfizer  | AstraZeneca | Janssen | Total   |
| Blood & lymphatic system          | 1,578                  | 11,621  | 3,308       | 146     | 16,653  |
| Cardiac                           | 532                    | 4,237   | 4,524       | 169     | 9,462   |
| Congenital                        | 3                      | 17      | 17          | 0       | 37      |
| Ear & labyrinth                   | 413                    | 3,720   | 3,244       | 130     | 7,507   |
| Endocrine                         | 10                     | 60      | 75          | 2       | 147     |
| Eye                               | 444                    | 3,672   | 4,821       | 213     | 9,150   |
| Gastrointestinal                  | 6,686                  | 34,803  | 36,773      | 3,502   | 81,764  |
| General & administration site     | 25,587                 | 120,217 | 118,343     | 9,626   | 273,773 |
| Hepatobiliary                     | 6                      | 70      | 76          | 5       | 157     |
| Immune system                     | 166                    | 873     | 628         | 21      | 1,688   |
| Infections & infestations         | 771                    | 6,534   | 6,193       | 165     | 13,663  |
| Injury, poisoning & complication  | 348                    | 1,516   | 3,600       | 94      | 5,558   |
| Medical Investigations            | 1,332                  | 6,352   | 9,209       | 884     | 17,777  |
| Metabolism & nutritional          | 241                    | 1,571   | 2,994       | 82      | 4,888   |
| Musculoskeletal                   | 12,464                 | 63,533  | 72,179      | 6,530   | 154,706 |
| Neoplasms                         | 2                      | 28      | 88          | 1       | 119     |
| Nervous system                    | 12,057                 | 68,705  | 81,381      | 7,398   | 169,541 |
| Pregnancy, puerperium & perinatal | 2                      | 23      | 40          | 0       | 65      |
| Product issues                    | 1                      | 66      | 30          | 4       | 101     |
| Psychiatric                       | 423                    | 4,446   | 4,586       | 178     | 9,633   |
| Renal & urinary                   | 83                     | 478     | 957         | 34      | 1,552   |
| Reproductive & breast             | 223                    | 1,325   | 3,888       | 75      | 5,511   |
| Respiratory & thoracic            | 1,159                  | 8,926   | 8,779       | 490     | 19,354  |
| Skin & subcutaneous tissue        | 3,461                  | 15,194  | 14,013      | 699     | 33,367  |
| Social circumstances              | 27                     | 161     | 325         | 14      | 527     |
| Surgical & medical procedures     | 15                     | 159     | 185         | 2       | 361     |
| Vascular                          | 736                    | 5,786   | 6,181       | 175     | 12,878  |
| Total                             | 68,770                 | 364,093 | 386,437     | 30,639  | 849,939 |

Source: EudraVigilance European database for suspected adverse drug reaction reports

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

## Test & Trace Twister

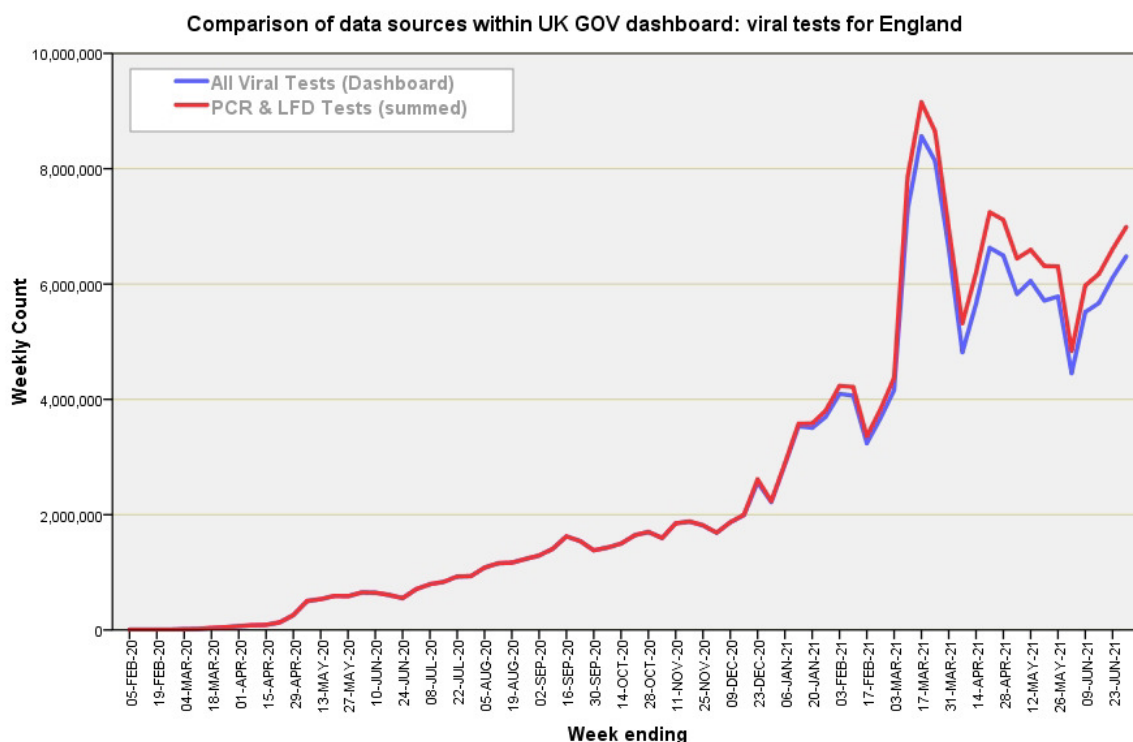
I'm currently trying to reconcile test volume data from the NHS test & trace system with test volume data from the UK GOV coronavirus dashboard and I'm finding the usual inconsistencies. Before I reveal a slide it's worth considering this little note tucked away in a test & trace datafile...

Note: De-duplicated for each reporting week. Reporting began on 15th October 2020. These figures cover all types of testing from when they were first introduced. Lateral flow Device (LFD) tests were introduced from 21 October 2020 and have increased over time as they have been rolled out. It is no longer recommended that these figures are used to calculate a positivity rate as it likely LFDs have a different positivity rate to PCR tests due to their use in mass testing. A consistent positivity rate therefore cannot be calculated. From 14 January 2021, the data source used to produce these figures has changed. This has had a small effect on all historical T&T data. Users are therefore advised to use the most up-to-date data available whenever possible.

...those first few words are very important for they reveal what the data authorities are actually doing to avoid double counting test results as opposed to what we think they may be doing when they say "duplicates are removed". This is not exactly correct – they're simply avoiding counting the same person's results for that week. This is useful in that it removes the ridiculous multiple weekly testing of those in education but it doesn't stop double counting of the same people being tested once per week every week by way of job requirement etc. Duplicate cases are therefore not being removed as we've come to believe by UK GOV dashboard blurb – and it's there in black and white tucked away in a spreadsheet!

The bit about not using the figures provided to calculate a positivity rate (aka infection rate or disease prevalence) is also noteworthy, being a means to scupper efforts by folk like myself to understand what is going on. We should note the suggestion that LFDs are "likely" to yield different results to PCR – here we have two tests giving different answers yet the authorities consider all this to be a robust means of assessing the situation! I shall endeavour to tease this issue apart and obtain separate estimates of LFD and PCR performance in assessing prevalence.

The first step toward this is to check that data across sources are consistent, and this is patently not so. In the slide below I present counts of all viral tests according to the UK GOV dashboard (blue line), as well as summed counts of PCR and LFD tests also taken from the dashboard (red line). These should be identical but they're not – once again we find we are missing some data!



5<sup>th</sup> July 2021

## ***Disease Prevalence Using Test & Trace Data***

The test & trace data released to the public by NHS England rather usefully splits counts of tests undertaken into pillar 1 (those with a clinical need) and pillar 2 (the wider community) and reveals the number of people subjected to these tests. Another useful feature is that anybody being tested under both pillars is only counted once, this being under the pillar for which they were first tested. However, in my previous post entitled *Test & Trace Twister* we discovered the extent of de-duplication (as they call it) only extends back to the week in question. This is both good and bad news in that we need full head counts every week even if the same head is cropping up week after week, but we need to realise all counts will be boosted by re-testing of the same folk.

Another wrinkle is the lumping together of test results using PCR and lateral flow kits (LFD) since – according to NHS England – these are likely to give different results (do I hear hysterical laughter?). Not only that but LFD is aimed squarely at the education sector and those workplaces with woke management who consider testing of everybody Monday morning at 9am is going to ensure a viral free environment come Monday 5pm. We may thus expect to see a flurry of LFD testing amounting to very little (apart from share price value) and this is precisely what we observe (slide #1).

The good news from an analytical point of view is that LFD testing occurs within the pillar 2 scheme, with PCR being the test of choice for the pillar 1 scheme, so keeping pillars separate helps us retain some semblance of sanity. When we do this and we calculate positive cases per 100 people tested within pillars we fetch up with slide #2.

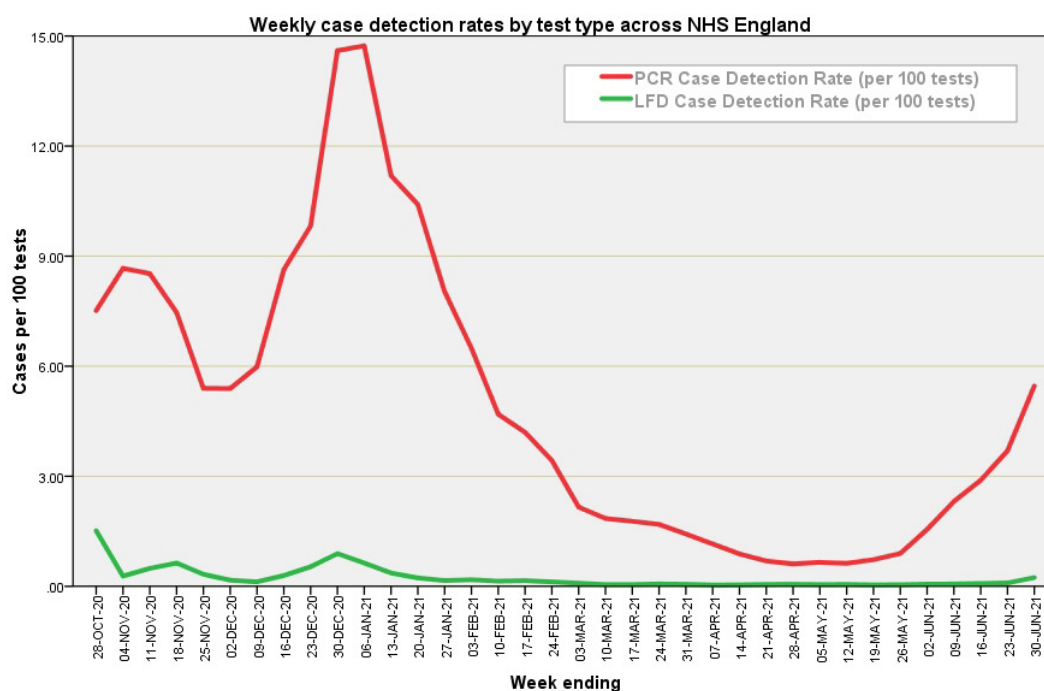
There are a few things to bear in mind when considering this analysis starting with PCR dominance of pillar 1, LFD dominance of pillar 2 from w/e 21st October 2020 onward and the different environments (clinical setting vs. school or workplace). We must also appreciate that neither series offers a truly random sample of tests undertaken on the population as a whole, so estimates of disease prevalence (cases per 100 people tested) are likely to be biased toward over-estimation. Indeed so, for if we consider the period w/e 31st March – w/e 26th May 2021 we see prevalence bobbing about at around 1% at a time when the REACT study estimated national disease prevalence to be 0.1% - a chance for calibration methinks!

Two features of slide #2 stood out for me, these being the striking similarity in pillar 1 and pillar 2 prevalence estimates at the start and end of the study period and the big green hump for October 2020. This divergence is telling us that the virus was rampant in the wider community but not at the clinical sharp-end during last autumn. This doesn't make sense unless we dial-in post hoc explanations such as outbreak of a milder variant or outbreak amongst a healthier, younger community. One thing that did happen during October 2020 is we introduced a gazillion LFD

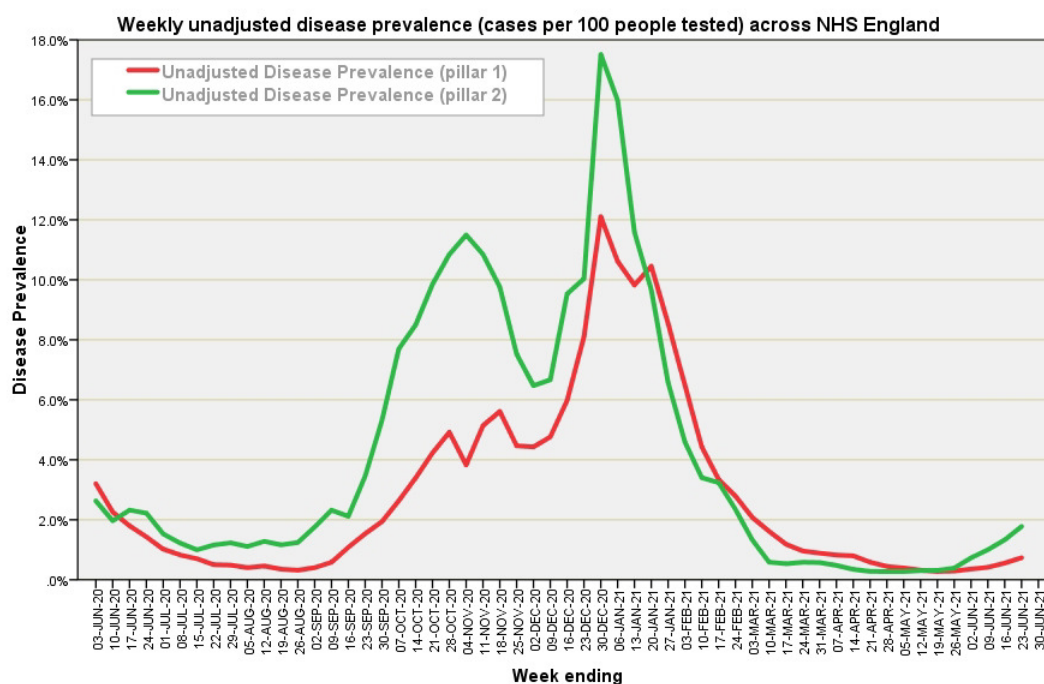


tests and made them available to anybody and everybody with or without a clinical need; are we looking at a mountain of false positives arising from a new test methodology?

The headache here is to decide whether the data series for pillar 1 or pillar 2 is more representative of the national prevalence profile, and since I cannot make my mind up either way I'm inclined to calculate the mean as a starting point and see where we go from there.



Source: NHS England, UK GOV coronavirus dashboard



Source: NHS England, UK GOV coronavirus dashboard

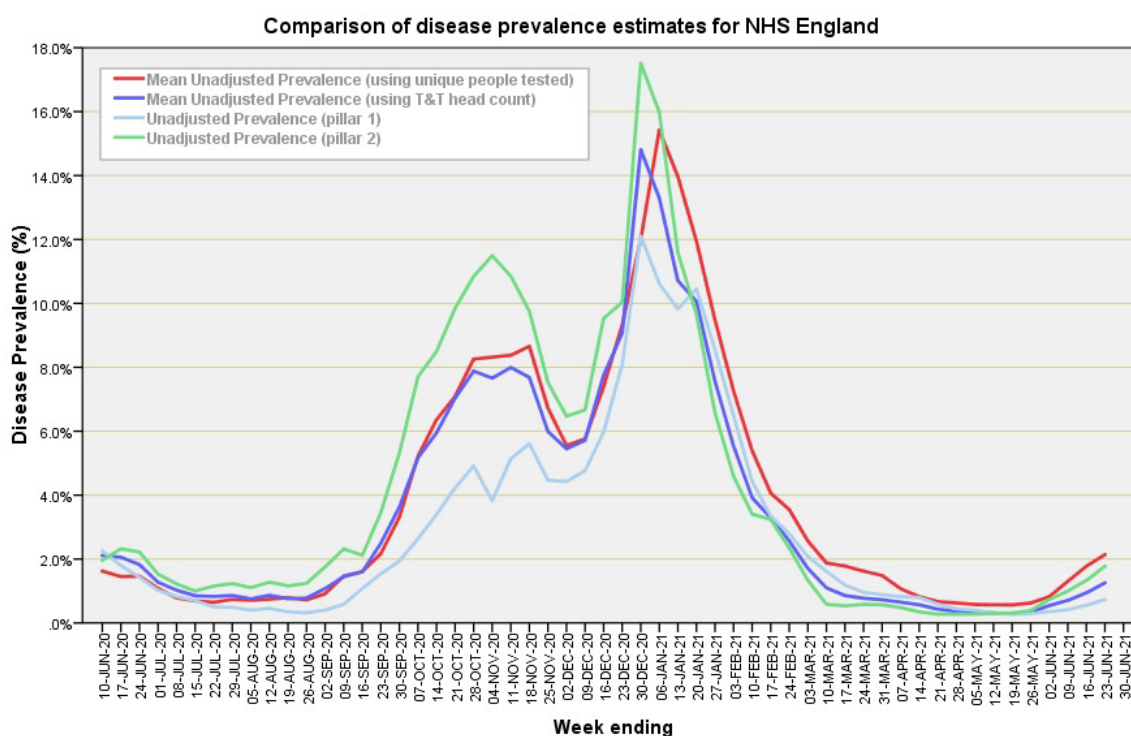
## Comparison of Estimates for Disease Prevalence

This is one of those slides that will not make sense to anybody not following the deep story. It started with my chance discovery last May of a strange and undefined variable hiding within the UK GOV dashboard called `uniquePeopleTestedBySpecimenDateRollingSum`, which appeared to provide head counts of people being tested - a necessary prerequisite for the calculation of disease prevalence. A peculiar story then unfolded with the discovery of negative daily counts being entered into this data series every Monday morning, with the dashboard team ignoring my request for clarification. I assumed these were book-keeping attempts to remove counts of people who had been tested the week before that had been tested prior to obtain true test uniqueness – a singularly pointless variable! Using statistical modelling I estimated what the negative entry counts should have been in order to put missing folk back so I could calculate disease prevalence, thence to calculate the false positive rate (FPR) over time, thence to provide slides of FPR-adjusted analyses in all shades and flavours.

At the back of my mind lurked a niggler that I might have made a right pig's ear of this and so I turned to the NHS test & trace databases for derivation of alternative estimates of disease prevalence using the head counts provided for pillars 1 and 2, with production of a thumb-in-the-air mean series as a way of settling differences. The attached slide is the sum total of all this work and I am mighty pleased!

Weekly means of my original daily prevalence estimates using the adjusted `uniquePeopleTested` data are depicted in red, and sitting next to these are weekly means of combined pillar 1 and pillar 2 prevalence estimates in royal blue. That's not a bad match even if I say so myself and vindicates my earlier efforts. My assumption of what `uniquePeopleTestedBySpecimenDateRollingSum` actually means as a data series is therefore most probably correct and my handling of the negative daily counts surprisingly sensible; though I did not know this at the time! This is tremendously good news for group members who have digested my FPR-adjusted analyses on good faith on the assumption I knew what I was doing (I don't always).

For good measure I've thrown in the individual pillar series so we may see what happens when PCR tests are used in clinical settings (pillar 1 – pale blue) and when something as hideous as DIY lateral flow testing (LFD) is made available to school children on a bi- or tri-weekly basis during the autumn term of 2020 (pillar 2 – pale green). With this confirmation in my back pocket I can now proceed with FPR-adjusted analysis of hospital admissions and bed stays.



Source: NHS England, UK GOV coronavirus dashboard

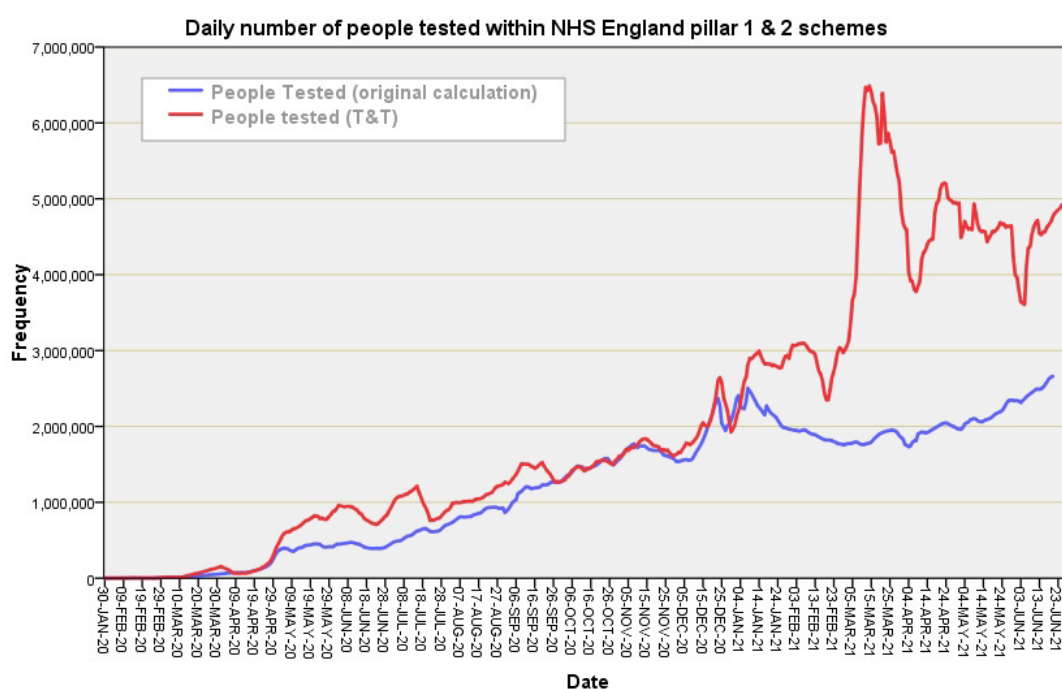
## Latest Estimate of Disease Prevalence

For the last few days I've been steadily working through various data series downloaded from the UK GOV coronavirus dashboard and the NHS England test & trace web pages. My main objective has been to get a decent estimate for the head count of people tested on a daily basis – a figure you'd think was available on the main dashboard. 'It ain't necessarily so', sang the character Sportin' Life, a drug dealer in Porgy and Bess. In his song Sportin' Life expressed doubts about several statements in the Bible, and here I am expressing doubts about several statements made by Her Majesty's Government; replace drugs with biscuits and there you have it.

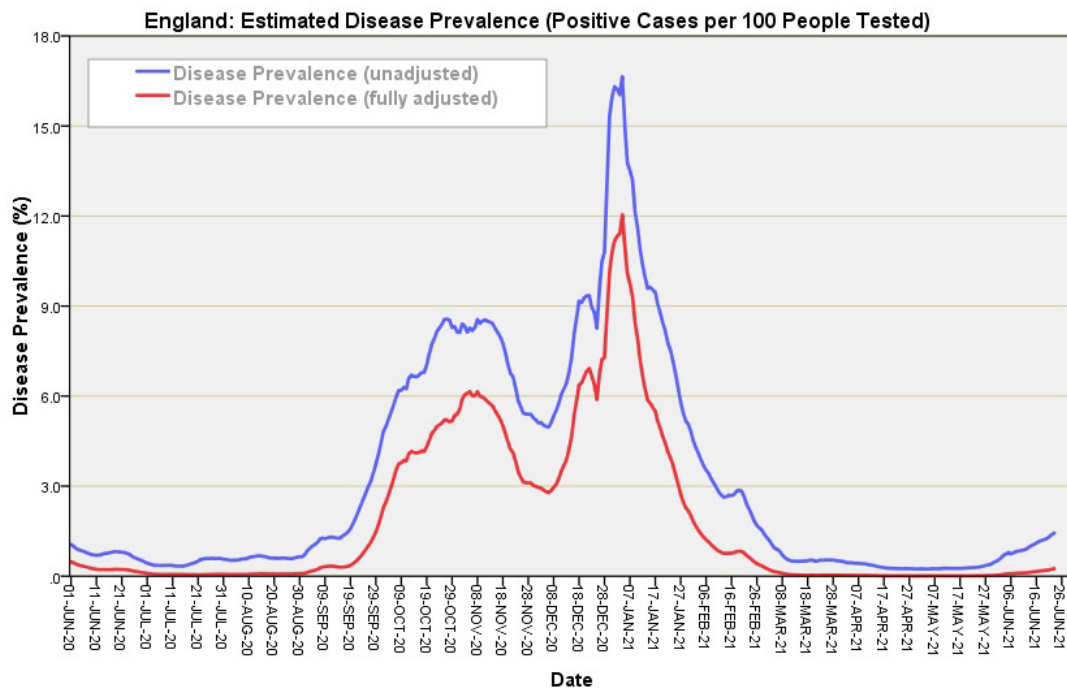
I've now got my decent estimate and this is revealed in slide #1 (red line). That thin blue line came about with me fiddling with that weird variable `uniquePeopleTestedBySpecimenDateRollingSum`, with attempts to convert it from unique people tested to people tested. As you can see I fell flat on my face from Jan 2021 onward, with gross underestimation of the head count and this will have over-inflated estimates of disease prevalence.

In the second slide we get to see my latest estimate for disease prevalence after adjusting for false positive reporting (assuming 80% test sensitivity and 97% test specificity) and test rate bias (the number of tests a person is subjected to has been changing over time, a variation that will impact on likelihood of case detection). The blue line is the estimate of disease prevalence we obtain if we don't bother making any adjustments. All of this, of course, is subject to much assumption and hand waving but it's the best my brain can produce right now!

We may note the red line hits rock bottom during the period February – May 2021, with a mean daily prevalence of 0.08% for the month of March, which compares favourably with the REACT study estimate of 0.10% - this gives me confidence that I'm heading in the right direction with all this fiddling.



Source: NHS England, UK GOV coronavirus dashboard



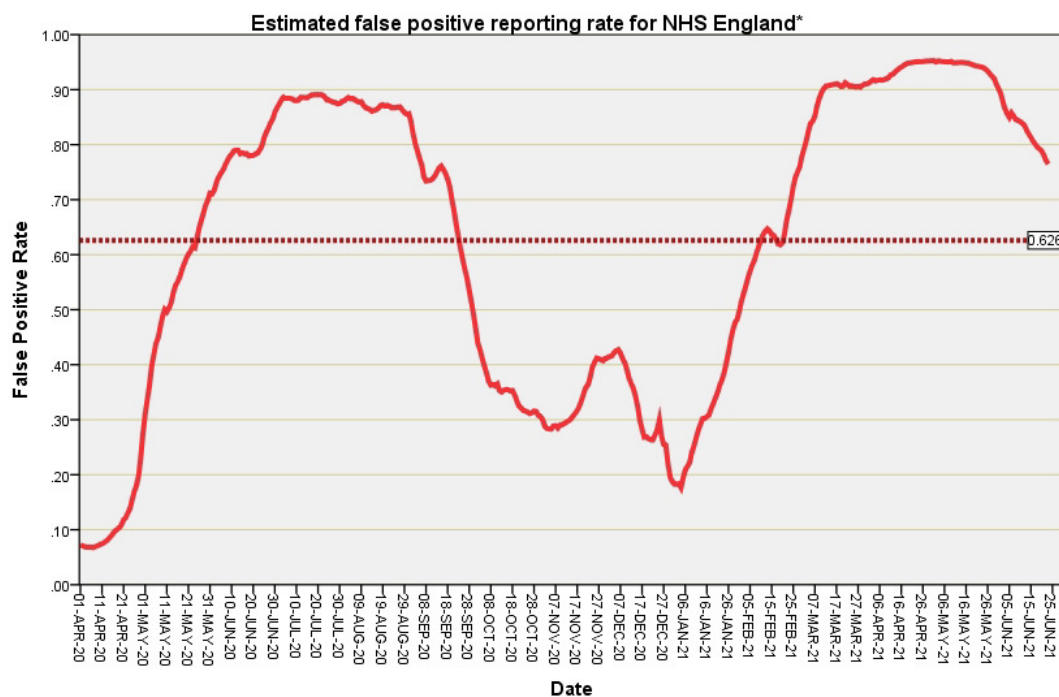
Source: <https://coronavirus.data.gov.uk/>

### ***Latest Estimate of False Positive Reporting Rate***

With revised estimates of disease prevalence in my pocket I can now revise the curve for false positive reporting rate. There's even more hand waving going on here for I have assumed 80% test sensitivity and 97% test specificity in the absence of any robust and independent assessment of standards in working laboratories up and down the country (bench-marking by test manufacturers is akin to asking the accused if they are innocent instead of twelve good and true members of the jury). Where assumptions get really hairy is from October 2021 onward when lateral flow kits were dished out in the gazillion – I have no idea how they perform compares to PCR. That being said cases identified using PCR still dominate figures, with 3,563,128 cases detected by PCR alone, 138,310 cases detected by PCR following LFD use and 90,824 cases detected by LFD alone since October 2020. Thus we see PCR provides the lion's share of data at 97.6% of all cases detected.

In the attached slide we see the false positive report rate swing from around 6% to 95% as disease prevalence waxes and wanes. The false positive rate is always high when disease prevalence is low simply because the chance of detecting a true positive during these periods is pretty minimal, so the likelihood of a false positive becomes relatively more noticeable. The average rate for the period 1<sup>st</sup> April 2020 – 23<sup>rd</sup> June 2021 fetches up at 62.6% (red dashed line).

I'm sure Her Majesty's Government realise this with all that expert advice they get, so we can conclude they don't give a flying faggot about the poor folk who are now being labelled as 'positive' when in all likelihood they are no such thing. A tip for business owners - the quickest way to go bankrupt is to test your staff willy-nilly during periods of low disease prevalence. When the Prime Minister announces a serious and most concerning rise in new cases in the next month or two please do wave this graph under his nose if I can't find time to produce an update.



Source: NHS England, UK GOV coronavirus dashboard; \* assuming 80% sensitivity, 97% specificity.

7<sup>th</sup> July 2021

## Re-adjustment of Disease Prevalence & False Positives

False positives, like true positives, false negatives and true negatives are part and parcel of medical diagnostic testing. You can't escape this reality unless you make a test that is 100% absolutely perfectly reliable every time it is used. No such test is ever likely to exist. You could also make a test that is utterly useless, being no better than tossing a coin, but even then you'd still get a mix of false positives, true positives, false negatives and true negatives. These are the four inescapable outcomes for any and all medical diagnostic tests, the PCR test being but one very topical example.

What I've been doing is alerting folk to this fact of diagnostic life and showing how false positive reporting can lead to incorrect diagnoses unless common sense is used. Unfortunately common sense has been ruled out by the authorities, including that very finely honed sense that comes with a highly trained physician telling you to ignore the test result. We have a nose poke, an automated test process and a rigid protocol to follow as though we are components on a circuit board.

In pre-COVID days a false positive test result was inferred because the patient didn't develop any symptoms and felt just fine and dandy, with reassurances made by a highly trained physician. Physicians I know don't even order a test unless they feel confirmation of their expert diagnosis is warranted. These days we label these cases as 'asymptomatic' and ask folk to lock themselves away. Authorities act as if the PCR test can only generate true positives and true negatives even though this cannot logically be so.

To determine how these four possible outcomes stack up you need to know test sensitivity (how good the test is at detecting positive cases), test specificity (how good the test is at rejecting negative cases) and what is sometimes called the pre-test probability. This is also known as disease prevalence (a.k.a. infection rate) and is the percentage of infected individuals within a population. Thus a rate of 1% means 1 in 100 individuals are infected. This is why I've been putting in effort to try and get a decent estimate for disease prevalence across NHS England.

To estimate disease prevalence you need to know the number of people tested and the number among these who test positive. But here's the brain-mangler... the number who test positive will be a mix of true positives and false positives, so your case count will be over-inflated. If you then use an over-inflated case count you produce an over-inflated estimate of disease prevalence. If you use an over-inflated estimate of disease prevalence to calculate the four possible test outcomes you end up underestimating the false positive count.

This is the ragged situation at which my analyses currently stand – I have produced estimates of disease prevalence that are over-inflated and estimates of false positives (FPR) that are underestimated simply because I am relying on the output of a test that is generating true and false positive results. Though, that being said, I am at least approaching the 'true' situation even if I haven't got there yet!

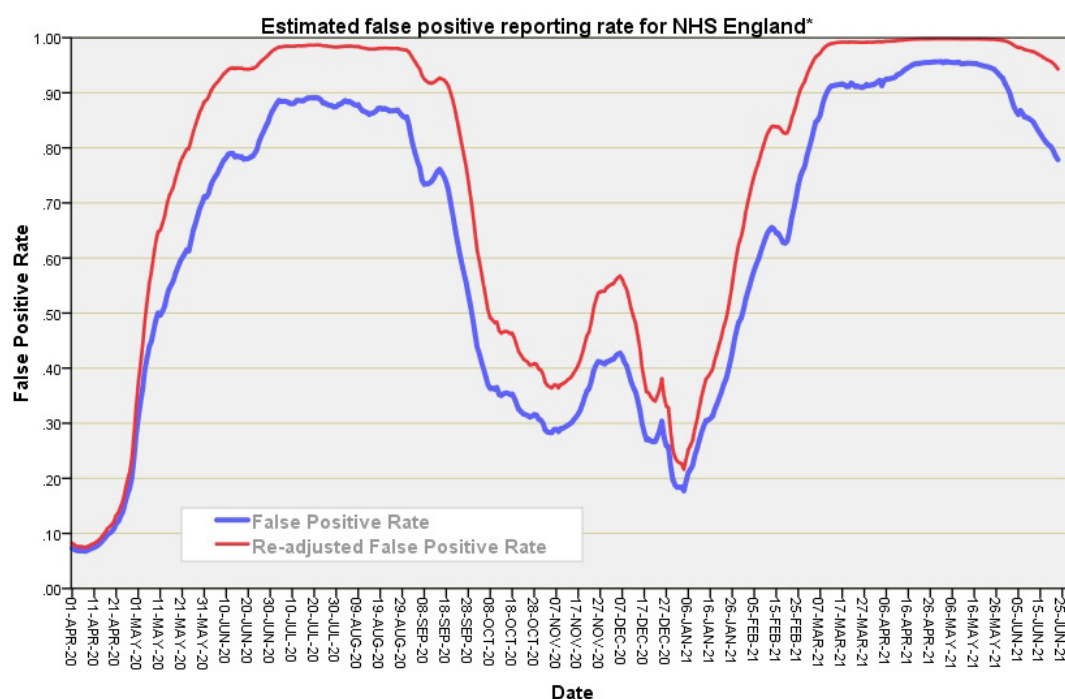
This is akin to a dog chasing its tail and, like a dog chasing its tail, I have to go around and around. The word here is iteration and on the numbers front I have to iterate the process again and again until some sort of asymptote or convergence is reached for test outcomes.

What I've done this morning is to take my FPR-adjusted estimates of disease prevalence to re-calculate false positive reporting, this being the second iteration and second loop of the dog and its tail. The re-calculated FPR rate was then used to re-calculate disease prevalence, the idea being to iterate down to the truth for a test that doesn't work that well.

In the attached slide we may compare my first iteration (blue line) with the second iteration (red line). What is darn interesting here is that the false positive rate has now more or less maxed out at 100% during the summer months, which is in keeping with anecdotal evidence from friends, colleagues and group members. Obviously this is something Her Majesty's Government is not going to admit to, yet it is a logical conclusion of iteration to minimise reporting bias.

I have no idea what will happen if we iterate the process several times but I'll try and find the space to fiddle with this. At the back of my mind is lurking a wild thought that FPR would saturate to 100%, a less wild thought is that the process would asymptotically approach the performance of a test performing no better than a random number generator.

This latter thought has got my juices flowing for it would be entirely possible to construct a statistical method to determine if the PCR test is doing something genuinely systematic or simply regurgitating a string of random numbers. My gut suggests something systematic drowning in more random garbage than manufacturers would care to admit but then again that could be last night's halloumi and chorizo bites also reiterating.



Source: NHS England, UK GOV coronavirus dashboard; \*assuming 80% sensitivity, 97% specificity.

## Is Viral Testing Churning Out Random Numbers?

That's a hell of a question to ask but I do like to play the Devil's avocado now and then! In my previous post entitled Re-adjustment of Disease Prevalence & False Positives I floated the suggestion that it would be entirely possible to construct a statistical method to determine if viral testing is doing something genuinely systematic or simply regurgitating a string of random numbers.

We start by considering that if testing was indeed a random process then the case counts we'd get would simply follow the numbers of tests undertaken and/or the number of people tested. It follows that if we can accurately predict case counts using test/people volume alone with a simple statistical model then we can be pretty sure the test is nothing but a random number generator responding to volumetric activity rather anything a virus might be independently doing.

To smooth out data processing wrinkles and allow for most administrative delays I decided to use rolling 7-day counts of cases, PCR tests, LFD tests and people tested. To minimise modelling error in a shifting situation I also resorted to using a four level block factor based on pandemic phase, such that Jan – May 2020 = block 1, Jun – Sep 2020 = block 2, Oct 2020 – Jan 2021 = block 3 and Feb – Jun 2021 = block 4, enabling four parallel models to be developed.



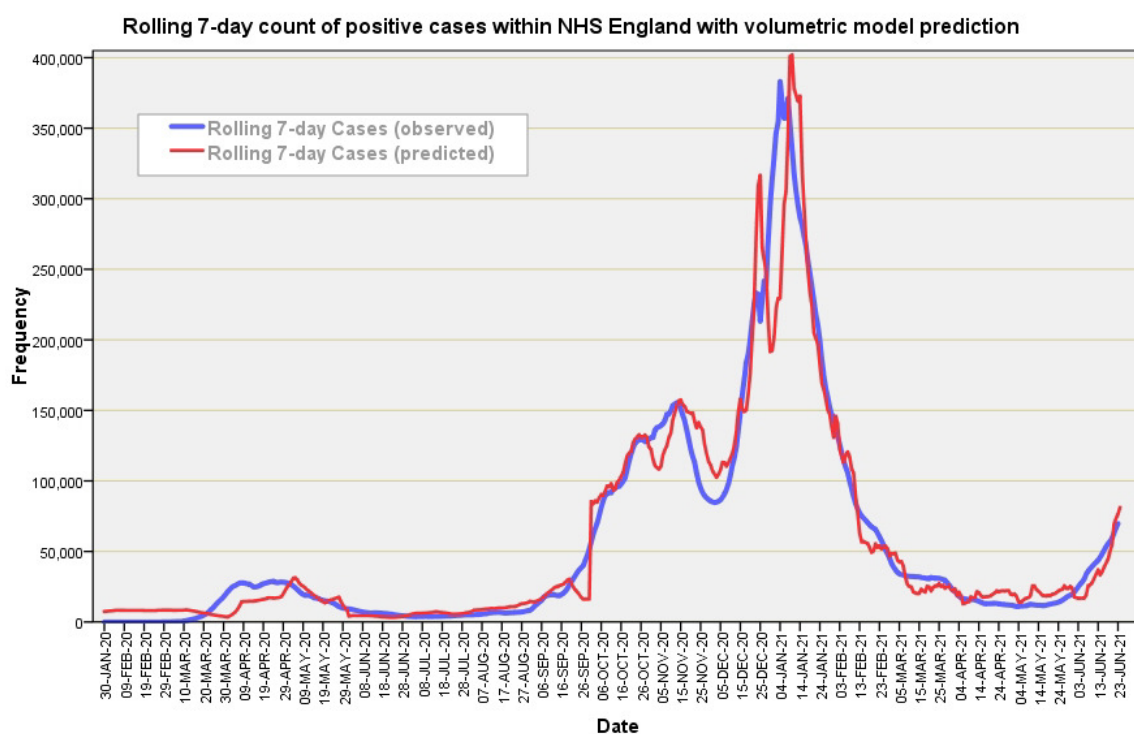
Generalised Linear Modelling (GLM) was employed using a Poisson loglinear model type with Fisher estimation based on Pearson chi-square scale parameter estimation. Rolling 7-day LFD testing failed to reach statistical significance and so was dropped from the modelling process. Using only rolling 7-day counts of PCR testing and individual people tested four highly simplistic parallel models were produced, the results of which are presented in the first slide.

The match between observed and predicted rolling 7-day case counts is astonishing by any standards, with the Pearson bivariate correlation coefficient hitting a hefty  $r = 0.962$  ( $p < 0.001$ ,  $n = 511$ ). This means that 92.5% of the variation we see in case counts over the entire course of the pandemic can be attributed to varying levels of PCR testing alone. Please read that again and let it sink in! People sometimes use the phrase 'bombshell' for astonishing results like this and I would suggest upgrading this to 'nuked'.

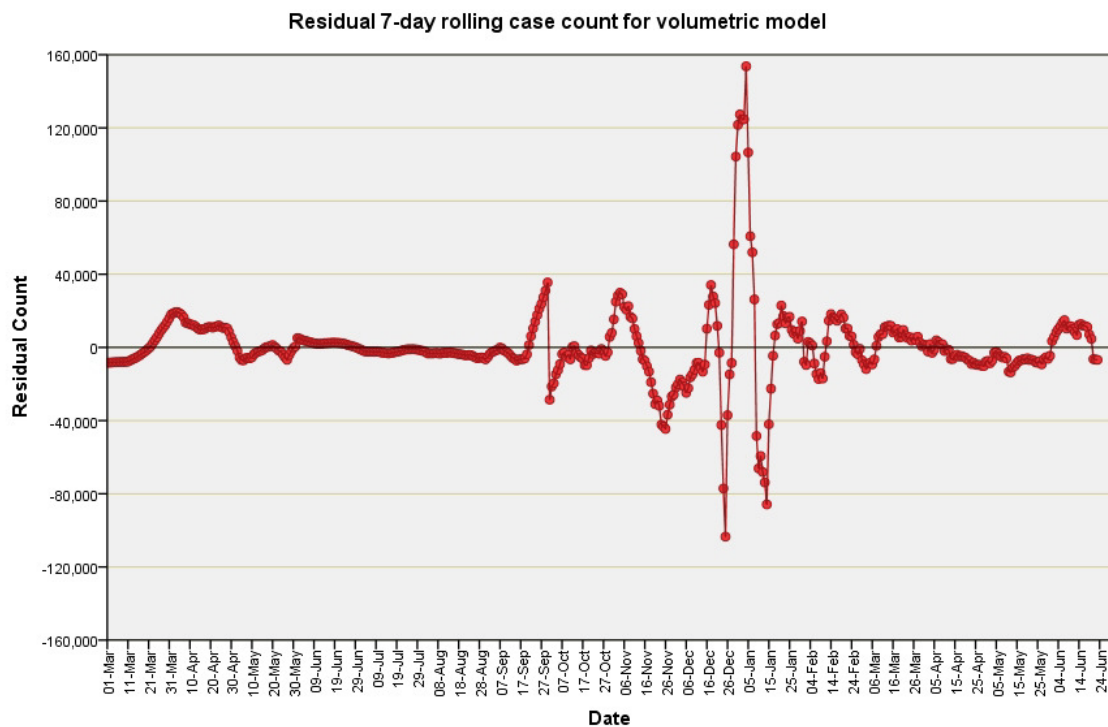
Consequently, we see that only 7.5% of the variation in the rolling 7-day case count can be attributed to systematic non-volumetric effects such as the detection of a viral infection that is waxing and waning. In this regard we can now examine the residuals from GLM modelling to see how and where systematic perturbations arise. In the second slide data points hugging the zero axis represent rolling 7-day counts accurately predicted by the volumetric model, so what we are looking for are perturbations.

There's a whopper of a negative perturbation lining up with 26 Dec and another whopper of a positive perturbation lining up with 5 Jan – these almost certainly arising from administrative delays (quiet festive hols followed by manic new year catch-up). Take these out and we see a few modest perturbations of interest, starting with a case surplus back in Mar – Apr 2020, an oddity around 27 Sep 2020 and another surplus around 27 Oct 2020 when our school kids went LFD crazy.

This is not the residual series we may expect of a test that is performing well and doing a good job of tracking a genuine viral outbreak. We should be seeing a well-defined and systematic positive surplus that rises and falls substantially in accordance with the rise and fall of (a test-independent)) infection, yet we see nothing of the sort; we see administrative artefact dominating that pithering 7.5% of variation in cases that isn't due to test volume.



Source: NHS England, UK GOV coronavirus dashboard



Source: NHS England, UK GOV coronavirus dashboard

8<sup>th</sup> July 2021

### ***Viral Testing And Vaccine Fallout***

Yesterday was full of shocking surprise. In my post entitled *Is Viral Testing Churning Out Random Numbers?* We got to see that variation in test activity alone was responsible for 92.5% of the variation in case counts, and somebody in the film industry with zero statistical knowledge tried to tell me I didn't understand what I was talking about. Bizarre. Today I thought I'd better cross-check matters by conducting two more analyses.

I dropped the 7-day rolling case count series (a smoothed series) as dependent variable and picked up the daily new case count as issued by UK GOV. This is a warty series that bounces about like a yo-yo owing to the impact of weekends on data processing and reporting. Trying to fit anything to this is like riding a camel on a tin tray.

Generalised linear modelling (GLM) in a blocked design was used as before (Poisson loglinear model with Fisher estimation based on a Pearson chi-square scale parameter), along with 7-day rolling PCR test volume and rolling 7-day people tested to allow for delays between testing and test result. A new variation was incorporation of dummy indicators representing day of the week – none of these reached statistical significance apart from the dummy indicator for Saturdays.

This is a rather interesting little finding in that the Saturday dummy didn't figure for the first two pandemic phases of Jan – May 2020 ( $p=0.415$ ) and Jun – Sep 2020 ( $p=0.127$ ), but for Oct 2020 – Jan 2021 and Feb – Jun 2021 Saturday case counts were marginally lower than expected at estimated factor rates of 0.782 ( $p=0.010$ ) and 0.759 ( $p=0.001$ ) respectively. I presume this is fallout from changes in data processing and it's worth asking just how the authorities go about counting cases (but see below!).

Performance of the generalised linear model (GLM) in predicting raw daily case counts may be observed in the slide #1 and once again I am astonished at just how good the fit is ( $r = 0.912$ ,  $p<0.001$ ,  $n=512$ ), with 83.2% of the variation in daily counts being explained by changes in test volume, people tested and something odd they're now doing on Saturdays.

For my second cross-check I wanted to do something very different so I resorted to Temporal Causal Modelling (TCM), this being an IBM SPSS implementation of Granger causality (please see Wiki for further information). This powerful time series technique permits multivariate modelling of time-based data, with the dependent variable of interest being the time series for daily new case count.

The most parsimonious model obtained incorporated the daily count for PCR tests ( $F=12.69$ ,  $df1=5$ ,  $df2=497$ ,  $p<0.001$ ) and the daily count for LFD tests ( $F=3.41$ ,  $df1=5$ ,  $df2=497$ ,  $p=0.005$ ) in the prediction of daily new case count in a most spectacular manner, as may be observed in

slide #1. The fit of predicted to observed data was once again extraordinary with  $r = 0.959$  ( $n=513$ ,  $p<0.001$ ) meaning 92% of the variation in daily new case counts had been explained by this simple TCM model.

Though it's nice to confirm results yet again, the real value here lies in analysis of the residuals. Yesterday somebody asked me what these residual charts represent and the simplest answer I could offer is that they represent daily case counts once we adjust for test activity. The residuals chart for TCM, however, is a little more complex in that it represents daily case counts once we adjust for test activity and all predictable variation in the case count time series itself. What is left is the unpredictable and this tells a fascinating story!

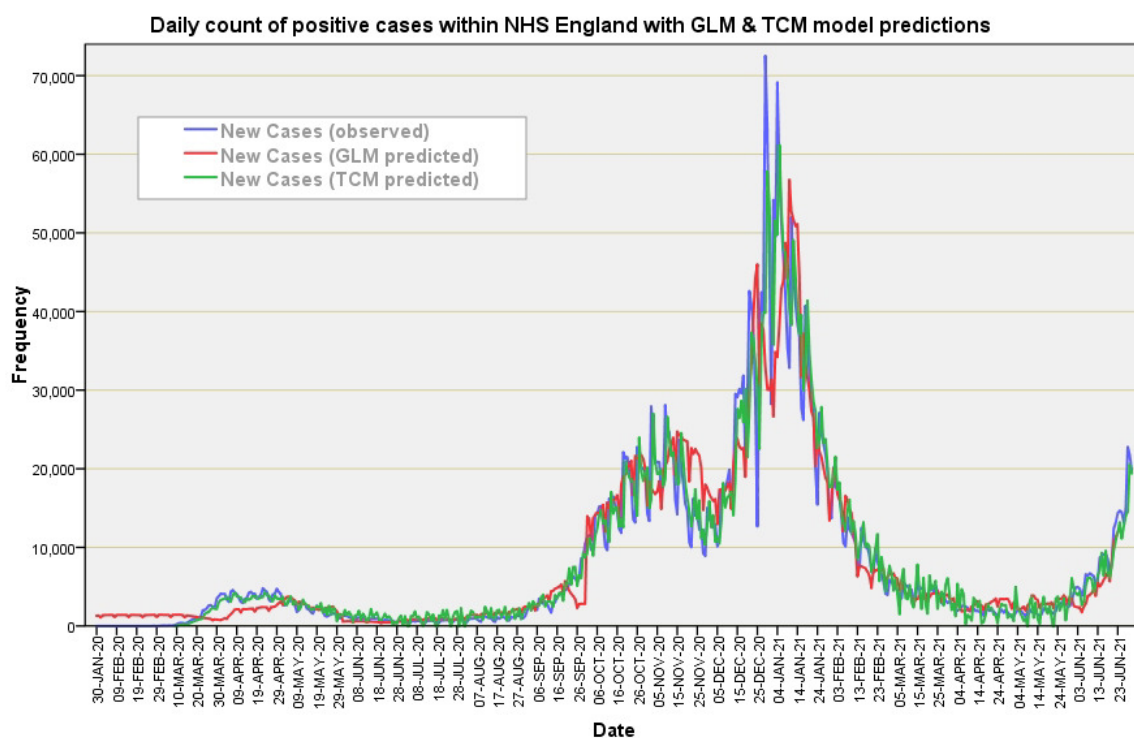
It starts with a red carpet of points from 1st Mar right up to 17th Sep 2020; we then see a kerfuffle during October 2020 before settling down to a negative excess that builds into the December spectacular that fades once again into a negative excess that slowly builds. This is mighty peculiar behaviour for a viral infection that is supposed to climb into case count excess then fall back to zero steadily over time.

Something that gives the game away is when we consider the October kerfuffle and December spectacular more closely. These spikes represent enormous and unpredictable variation within a single day, and it is quite clear that the extreme negative excess on 25th Dec that is followed by the extreme positive excess on 29th Dec is simply office folk catching up.

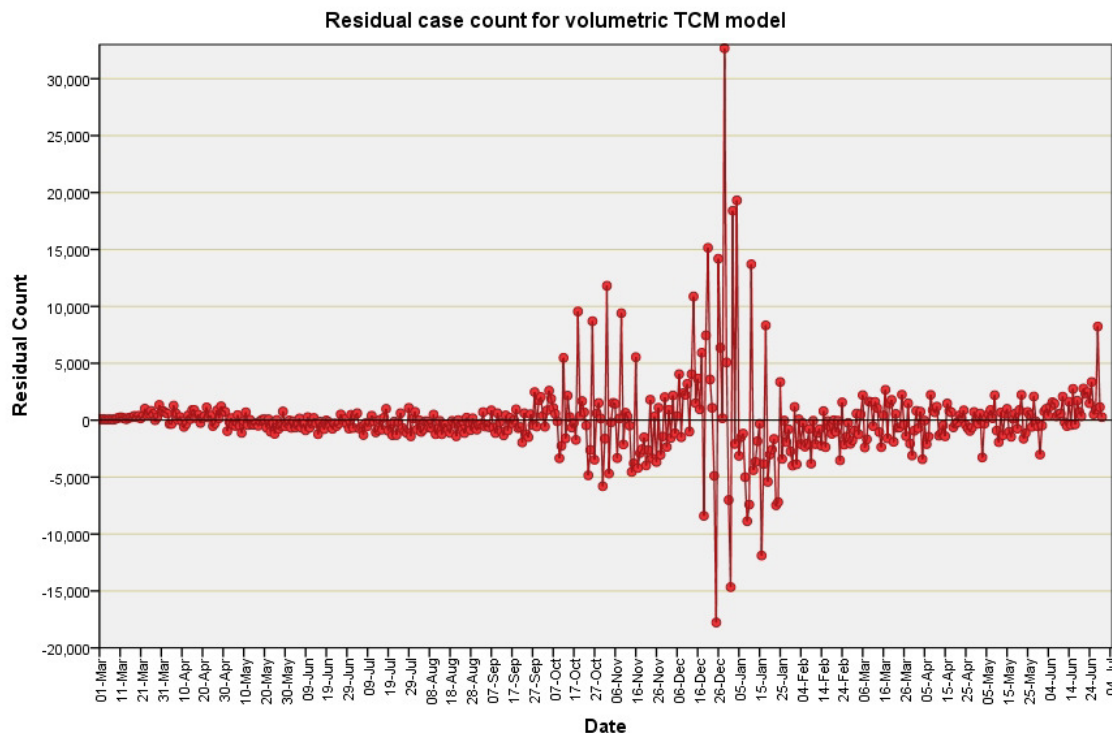
We should note that each and every spike is therefore some kind of reporting anomaly and not something a virus is doing. The naughty thought that comes to mind is whether the data authorities are juggling dates and counts to give the numerical impression of a pandemic when there isn't any such thing.

My eyeballs tell me the only consistent trend of any duration in this chart is the slightly positive trend for residuals from January 2020 onward. I think some of you may hazard a guess as to why there might be a gradual increase in residual daily case counts!

If I run OLSR trend analysis over these residuals we find complete lack of a slope for Jun – Sep 2020 ( $B1=+0.871$ ,  $n=122$ ,  $p=0.622$ ) and complete lack of a slope for Oct 2020 – Jan 2021 ( $B1=-10.210$ ,  $n=123$ ,  $p=0.526$ ), yet there is a highly statistically significant slope for Feb – Jun 2021 ( $B1=+16.011$ ,  $n=150$ ,  $p<0.001$ ) that indicates an inexplicable rise in daily cases to the tune of 16 more cases each and every day. Are we looking at evidence of the fallout from vaccination?



Source: NHS England, UK GOV coronavirus dashboard



Source: NHS England, UK GOV coronavirus dashboard

**9<sup>th</sup> July 2021**

### ***Intelligence Test***

A surprising number of people don't get the more tests = more cases relationship. The way I tackle this in real life is to get folk engaged in a simple question and answer session. If the penny doesn't drop then the light maybe on but there's nobody home, so I don't waste any further time. Here are two basic scripts that I use...

Script 1 for the more numerate:

Q1: If 10% of the population have COVID and we test 10 people on a Monday how many cases are we likely to find?

Q2: Given the same situation, if we now test 100 people on a Tuesday how many cases are we likely to find?

Q3: Has the number of cases risen?

Q4: Correct! But does this mean that the disease has spread?

Q5: So what information do we need apart from the number of cases to determine if the disease has spread?

Q6: What information does the government provide on a daily basis?

Q7: What information should the government provide on a daily basis?

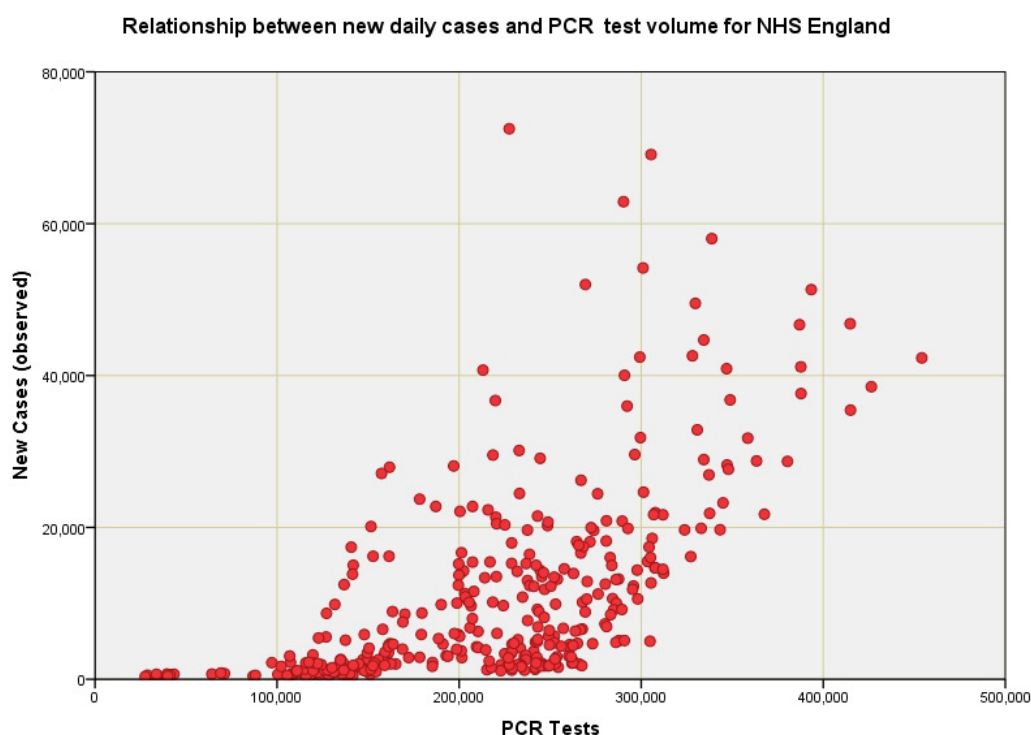
Script 2 for the less numerically able:

Q1: If I go and test 10 people how many positive cases can I possibly count?

Q2: If I go and test 100 people how many positive cases can I possibly count?

Q3: One hundred is bigger than ten, right? Does this mean there's more disease about?

...I attach a scatterplot of new daily cases against PCR tests for NHS England for those who think visually. If you don't know what testing is taking place you can't say anything about infection!



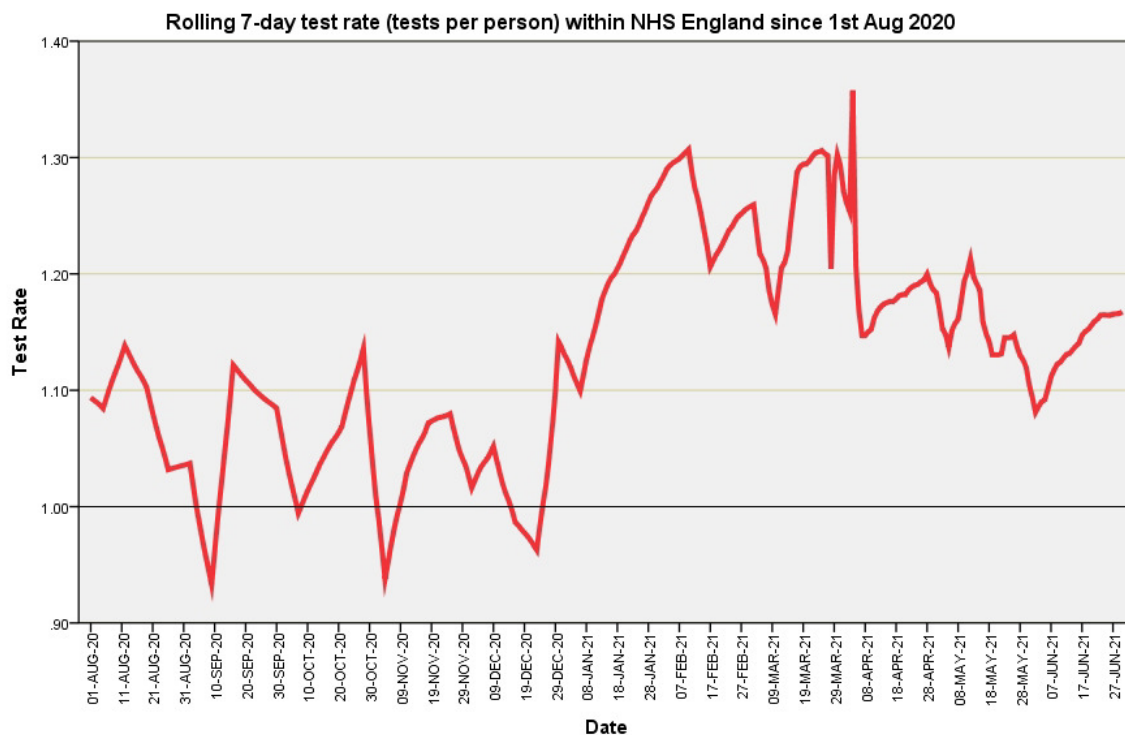
### ***Another Hidden Bias***

In my previous post entitled Intelligence Test I tackled the 'more testing = more cases' issue in as simplistic way as I could muster. My wife confesses that this subject "does her head in" and I suspect confusion arises in that both an increase in testing and an increase in the proportion of people infected will give rise to increasing numbers of cases over time. In stats speak these are confounding factors and you need to nail one before you can understand the other. If we don't nail testing we can't nail infection, so adjusting for test numbers (e.g. cases per 1,000 tests) is a logical place to start.

There is another wrinkle that goes unnoticed (even by many experts) and this is what I call 'test rate bias' (TRB). This related topic has popped up in a thread below and has prompted me to bang out this related post. TRB is simple to grasp if we cheekily consider what can possibly be done by the authorities to artificially boost case numbers; well, they can: 1). Conduct more tests; 2) Test the same people more often!

Testing people more often is flying under the radar so what I've done this morning is calculate the number of viral tests per person on a rolling 7-day basis since 1st August 2020. It is pretty evident from this slide that folk are now being tested more frequently, with a leap during January 2021 that would have guaranteed more cases for the same number of people tested. The mean test rate is now bobbing around 1.15 tests per person per week whereas it kicked-off at a mean of around 1.05 tests per person per week. All things being equal this modest change in the national test strategy would be expected to yield a 9.5% increase in weekly cases - a neat conjuring trick!

We may note the gradual decline in the test rate as we progress through summer. If you want to use a hidden lever to affect case counts then altering tests per person is as good as any.



Source: NHS England, UK GOV coronavirus dashboard

10<sup>th</sup> July 2021

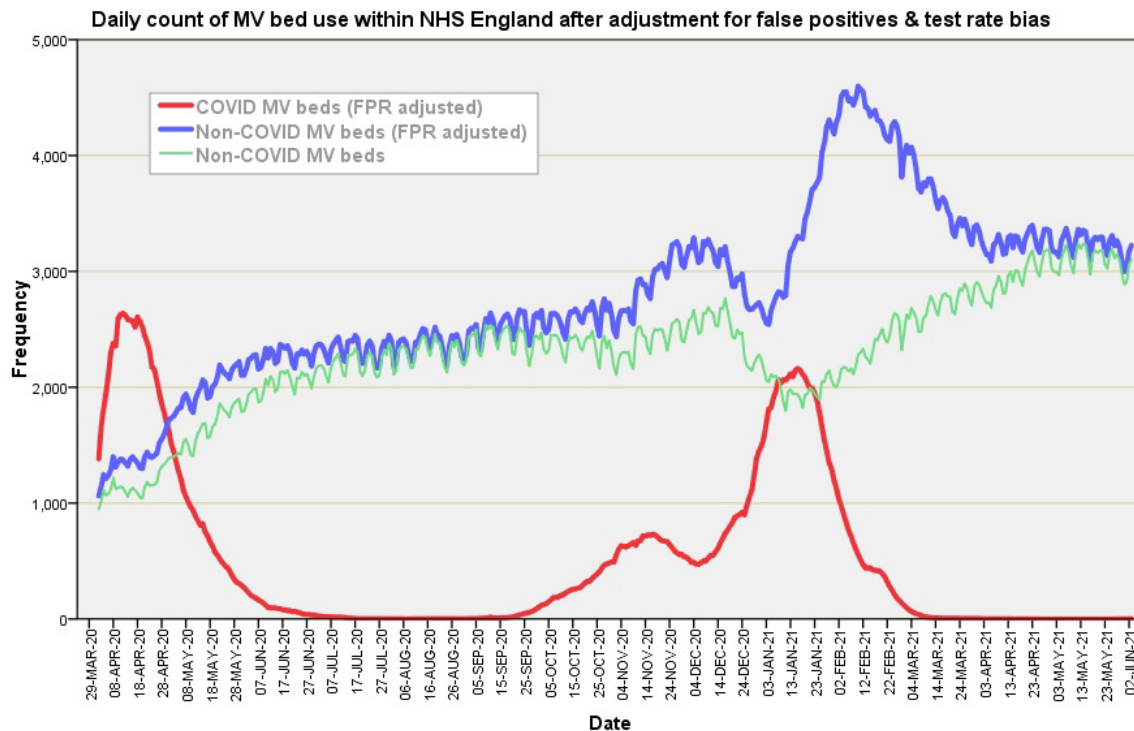
### ***Mechanical Ventilation Bed Use***

With improved estimates of the false positive reporting rate in my back pocket and the discovery of 2,998 MV beds allegedly in use at University College Hospital on 13<sup>th</sup> March 2021 (whose critical care unit possesses just 54 beds) I thought I might take a look at national MV bed use after adjusting for test rate bias, false positive reporting and UCL's blip. Some folk will argue that false positives surely don't apply to folk on a ventilator since being on a ventilator is proof enough of their COVID status. Whilst this would normally be a most reasonable argument it doesn't reflect what is actually happening with bed management in hospitals as related to me by clinical professionals concerned with patient management and welfare. It would seem our hospitals have become slick COVID machines, branding and labelling patients at the drop of a swab. Hard working and dedicated staff cannot be blamed for this since this is top down management largely driven by WHO-flavoured NHS protocols. It doesn't matter if you've suffered emphysema for 40 years and are displaying classic symptoms and presenting a classic chest X-ray that matches your prior X-ray, if your swab comes back positive you then become a COVID case and will be treated as such. No member of staff in their right mind is going to question COVID management right now, which is why I use the word 'machine'.

If we were to humanise the machine by adjusting mechanical ventilation bed counts to what they are more likely to be in a free-thinking world then we arrive at the following chart. The first thing we must note is that occupation of an MV bed doesn't mean the MV part is being used. Neither does the person occupying an MV bed have to be a respiratory case – bed managers are not that fussy when it comes to shunting folk about a busy hospital! It is important to realise that MV bed management is not the cut and dried situation that the public have been led to believe it is. Spend 5 minutes talking to a clinical nurse manager trying to ring fence beds on their own unit in any tertiary centre and you'll see what I mean. My manager wore a permanent scowl.

In this slide we get to see COVID cases dominating MV bed use back in April – May 2020 and that's about it, though last January looked a little hairy. The interesting thing for me here is the peak in non-COVID bed use (blue hump) following the COVID peak (red hump) at the end of the last 'flu season. Without adjustment for test rate bias and false positive reporting this blue hump doesn't exist (green line), which suggests coding of the usual run of seasonal respiratory cases as COVID. I know such abuse is happening because staff who are watching this happen are starting to confide in me, with more than one or two courageous nurses speaking up to report that in their unit they wheel patients into the COVID zone and repeatedly test them until they get a positive swab. It would seem evidence based medicine died in March 2020.





## Transmission Rate ('R') & Transmission Growth Rate

A fascinating issue that has been sitting on my bucket list since May 2020 has been the transmission rate (a.k.a. reproduction number a.k.a. 'R') and the transmission growth rate. These are not directly observed measures but arise from some pretty hefty modelling by several specialist analytical units. I'm not going to go into much by way of explanation and provide a link below to those who want more background, but basically what these two estimates try to do is quantify the expansion and contraction of the disease within the population as a whole.

If the transmission rate is up at 1.20 this means the disease is spreading and 10 people will be expected to infect 12 others. If the transmission rate is down at 0.90 this means the disease is in decline and 10 people will be expected to infect 9 others. The transmission growth rate is expressed as a percentage and a value of +3.0% means the number of new infections is growing by 3% per day. A value of -3.0% means the number of new infections is declining by 3% per day.

Given the sheer amount of effort gone into estimating these factors I thought it would be handy to see how they correlate to simple things we can directly observe such as cases, admissions, prevalence. Then the idea struck me that I could use these pinnacles of epidemiological effort to verify my own work – if I'm going down the right track with false positive and test bias adjustment then presumably the transmission rate and the transmission growth rate would correlate nicely.

[https://www.gov.uk/guidance/the-r-value-and-growth-rate?\\_ga=2.225609946.1743534002.1625898757-1481129743.1624698167](https://www.gov.uk/guidance/the-r-value-and-growth-rate?_ga=2.225609946.1743534002.1625898757-1481129743.1624698167)

11<sup>th</sup> July 2021

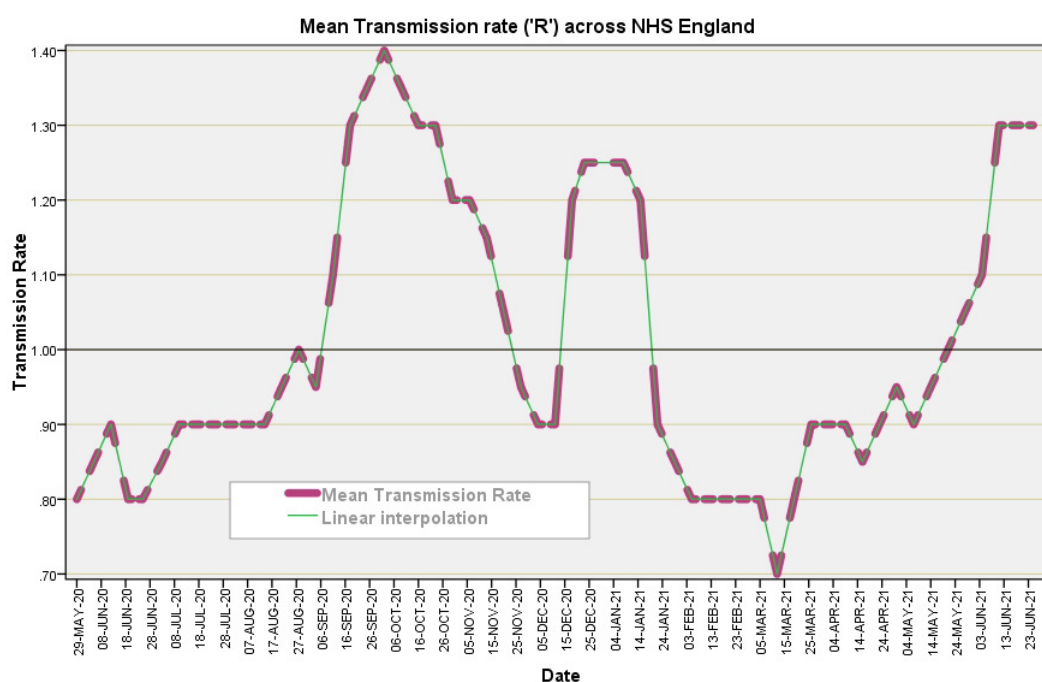
## Transmission Rate ('R') & Transmission Growth Rate Series

In my previous post I introduced these two bucket list variables and this morning we are going to kick off by looking at their variation over time for NHS England. If the transmission rate is up at 1.20 this means the disease is spreading and 10 people will be expected to infect 12 others. If the transmission rate is down at 0.90 this means the disease is in decline and 10 people will be expected to infect 9 others. The transmission growth rate is expressed as a percentage and a value of +3.0% means the number of new infections is growing by 3% per day. A value of -3.0% means the number of new infections is declining by 3% per day.

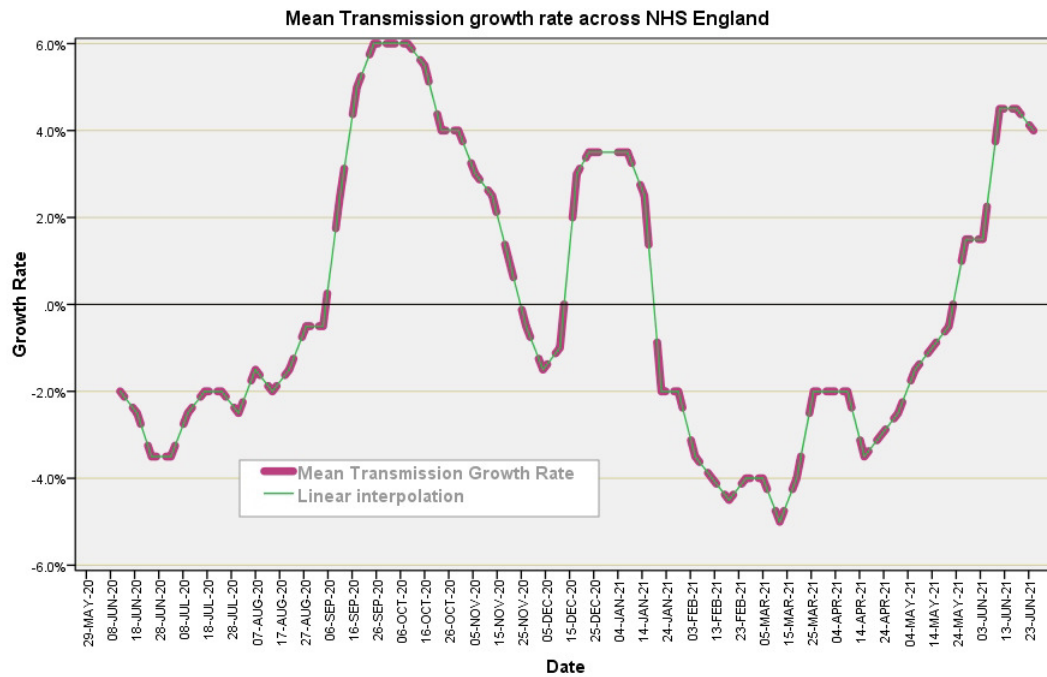
In the first and second slides we may observe the estimates made for each series respectively from 29<sup>th</sup> May 2020 onward, with the thick purple lines depicting values obtained from modelling runs and the thin green line depicting simple linear interpolation of these estimates. The two curves are largely similar even though they are measuring two different things, with the transmission rate estimating person to person transmissibility and the transmission growth rate estimating how quickly transmission is happening. This similarity means the disease spreads more quickly when person-to-person transmission is high, which makes a great deal of sense.

There's a dirty great hump in October 2020 that coincides with the return to school and consequent rise in testing within the education sector, with lateral flow kits being brandished willy-nilly both in schools and in the workplace regardless of symptoms. This hump, appearing as it does slap bang in crazy test time, thus must come tagged with a hefty degree of suspicion. We also see a hump during the festive holiday period, which happens to coincide with some suspicious number crunching activity (see my posts *Is Viral Testing Churning Out Random Numbers?* and *Viral Testing And Vaccine Fallout*). The June hump is intriguing because detected cases and admissions were pretty low, which would suggest rapid transmission of a virus that isn't doing much. It is with a wry smile on my face that I declare this to be an indication of rapid transmission of asymptomatic cases; it's worth asking what tea these modellers are drinking.

Experts who know these things much better than I do tell us that the relationship between the transmission rate and the transmission growth rate is complex, and will talk of Laplace-like transforms. I took the easy option and plotted values out on a scatterplot (slide #3) to find a ruler and pencil works just as well but without a requirement for substantial grant funding.



Source: UK GOV coronavirus dashboard



Source: UK GOV coronavirus dashboard



Source: UK GOV coronavirus dashboard, data period 29th May 2020 - 25th June 2021

## Testing Transmission

In my post entitled Transmission Rate ('R') & Transmission Growth Rate I suggested that it would be handy to see how these estimates correlate to simple things we can directly observe such as cases, admissions and prevalence. I also suggested I could use them to verify my own work. Nobody in their right mind puts coloured underwear in with their whites, so before taking these things for a spin I thought I'd better check nothing was heavily soiled. The trouble is, both estimates are heavily soiled and with the same brown substance.

Transmission should be all about cases, admissions, prevalence and people. It shouldn't be about the volume of testing, the type of testing, coding changes and test rates per person but this is exactly what we find. I ran generalised linear modelling (GLM) of daily mean transmission rate and mean daily transmission growth rate to find the following statistically significant predictor variables for both series: Rolling 7-day PCR tests per person; Total daily PCR tests; WHO COVID definition coding change indicator; Test & Trace reporting system change indicator; Introduction of lateral flow kits indicator. A summary table of GLM output is attached.

What this boils down to is that the more we bother to test individual people using PCR the higher the values for transmission rate and transmission growth rate are likely to be such that, a move from testing people once per week to twice per week increases the transmission rate 'R' by +0.2608 units ( $p < 0.001$ ), and increases the transmission rate growth factor by +4.9760% ( $p < 0.001$ ). This represents a significant source of bias in these highly cherished estimates and would suggest the modelling teams have overlooked this key factor.

The volume of tests should not impact on either of these estimates but it most certainly does! We now see a correlation between total daily PCR tests (million) and estimates for transmission as well as transmission growth rate such that an additional million PCR tests per day inflates the transmission rate by 1.0160 units ( $p < 0.001$ ) and inflates the transmission growth rate by +1.6690% ( $p < 0.001$ ). Thus, if we are currently looking good on a mean transmission rate 'R' of 1.00 this week and happen to undertake an extra million tests per day next week, then the rate will jump to 2.016. This also represents a significant source of bias, and the fact that this relationship is inherent in the official data should give us cause for concern. But that's not all...

There have been many changes in definitions and methods of counting tests, cases and admissions etc over time and so I chose just three indicator variables to see whether anything else may be lurking in the shadows. We now see that the WHO COVID definition change (ICD10) to embrace a wider range of conditions is associated with a modest upswing in transmission rate estimates to the tune of +0.0923 units overall ( $p = 0.001$ ), and with a substantial upswing in transmission growth rate estimates to the tune of +1.5450% ( $p = 0.003$ ). It would seem the transmission modellers have failed to take account of basic definition changes! But that's not all...

From the same table we can see that a change in the way the test & trace bods went about counting tests and heads is associated with an upswing of 0.1132 units in the transmission rate ( $p = 0.030$ ) and an upswing of 2.2340% in the transmission growth rate ( $p = 0.013$ ). It would seem that I'm not the only analyst struggling with goalpost changes!

We finally arrive at my introduction of lateral flow kits indicator, which reveals an associated downswing in transmission rate to the tune of -0.2218 units ( $p < 0.001$ ) and an associated downswing in the transmission growth rate to the tune of -3.9120% ( $p < 0.001$ ). I presume this is a function of kit performance and the sort of asymptomatic person who is likely to use it – we might even call this the orange juice effect!

So there we go. With just a tad of statistical modelling of official data we discover layer after layer of substantial bias hidden beneath what are arguably the most important figures guiding Her Majesty's Government. The lesson I learned a long time ago whilst serving that very same government is that a systems modeller is not a statistician, and rarely do they look out of the window to smell the flowers.

|                                                | Transmission Rate Model |            |              | Transmission Growth Rate Model |            |              |
|------------------------------------------------|-------------------------|------------|--------------|--------------------------------|------------|--------------|
|                                                | B                       | Std. Error | Significance | B                              | Std. Error | Significance |
| Constant                                       | 0.6550                  | 0.0342     | $p < 0.001$  | -6.5780                        | 0.7270     | $p < 0.001$  |
| Rolling 7-day PCR tests per person             | 0.2608                  | 0.0448     | $p < 0.001$  | 4.9760                         | 0.8230     | $p < 0.001$  |
| Total daily PCR tests (million)                | 1.0160                  | 0.0135     | $p < 0.001$  | 1.6690                         | 0.2329     | $p < 0.001$  |
| WHO COVID definition coding change indicator   | 0.0923                  | 0.0289     | $p = 0.001$  | 1.5450                         | 0.5238     | $p = 0.003$  |
| Test & Trace reporting system change indicator | 0.1132                  | 0.0523     | $p = 0.030$  | 2.2340                         | 0.8979     | $p = 0.013$  |
| Introduction of lateral flow kits indicator    | -0.2218                 | 0.0518     | $p < 0.001$  | -3.9120                        | 0.8897     | $p < 0.001$  |

12<sup>th</sup> July 2021

## False Positive Refresher

The false positive reporting rate lies at the heart of much analysis that I'm churning out at present so I thought it timely to run folk through a basic refresher so they can calculate this rate for themselves using nothing more than pencil and paper. In understanding how this comes about you'll know more than most alleged experts including those you'll be finding among your friends, family and colleagues.

The diagnostic performance of all medical tests, including PCR, is characterised by two estimates, these being test sensitivity and test specificity. Incredibly nobody knows precisely what these are for PCR but authorities have made a guess that sensitivity is 80% and specificity is 99.9%. We shall now consider what these mean

A test sensitivity of 80% means 80 out of every 100 people who are infected with COVID will be declared positive using PCR. These are what we call true positives because they have been told they are positive when they really are infected. The remaining 20 people, despite being infected, will be erroneously told they are negative and so we call these false negatives.

A test specificity of 99.9% means 999 out of every 1,000 people who are not infected with COVID will be declared negative using PCR. These are what we call true negatives because they have been told they are negative when they are uninfected. The remaining 1 person, despite also being uninfected, will be erroneously told they are positive and so we call these false positives.

Before we can apply these rates in a meaningful manner we need to know something called pre-test probability. This tells us how likely it is that somebody is infected as they turn up for a test. A pre-test probability of 10% means there is a 1 in 10 chance that they are carrying the disease.

The risk of contracting a disease depends on many factors such as where a person lives, where they work, what their job is, how they socialise etc and is thus a highly individual thing. For a hermit living in cave this probability drops to zero, for a frontline nurse on a COVID ward going to raves every night with colleagues this probability rockets.

Since it is near impossible to determine individual risk what we have to do is consider the population as a whole. If 1 out of every 100 people in a region are testing positive with symptoms then it is reasonable to assume the pre-test probability for others living in the same region is also down at 1% i.e. they all have a 1% pre-test probability of carrying the disease. Thus, the general rate of infection (a.k.a disease prevalence) becomes the figure we use for pre-test probability.

Let us now get our pencil and paper and, for simplicity's sake, we shall try some calculations using 10% for pre-test probability, 80% for test sensitivity and 90% for test specificity. We shall assume 1,000 people go for a test...

1. The first figure we need to determine is how many of those 1,000 are likely to be infected and the calculation for this is  $10\% \times 1,000 = 100$ . The number of likely uninfected people is thus  $1,000 - 100 = 900$ .
2. We now know there are 100 infected people. With a test performing at 80% sensitivity we are going to declare  $80\% \times 100 = 80$  of these as positive (true positives), thus leaving 20 infected people who were erroneously told they were negative (false negative).
3. We also know there are 900 uninfected people. With a test performing at 90% specificity we are going to declare  $90\% \times 900 = 810$  of these as negative (true negatives), thus leaving 90 uninfected people who were erroneously told they were positive (false positive).

Our 1,000 people have generated 80 true positives, 20 false negatives, 810 true negatives and 90 false positives. The total positive count is  $80 + 90 = 170$ , whilst the total negative count is  $810 + 20 = 830$ . We may now calculate four different rates: true positive rate, false positive rate, true negative rate and false negative rate:

- True positive rate =  $100 \times (80 / 170) = 47.1\%$
- False positive rate =  $100 \times (90 / 170) = 52.9\%$
- True negative rate =  $100 \times (810 / 830) = 97.6\%$
- False negative rate =  $100 \times (20 / 830) = 2.4\%$

I am hoping people have managed to reproduce these numbers and understand the very simple logic behind them. This logic is inescapable, for once you settle on a value for pre-test probability, test sensitivity and test specificity only one solution presents itself. The real issue is thus one of determining these initial starting values.

Those who've managed to follow the above example might like to try the same calculations again but with the 'official' 99.9% test specificity; my spreadsheet yields a false positive rate of  $100 \times (1 / 81) = 1.1\%$ . You might also like to try a 1% pre-test probability with 99.9% specificity; my spreadsheet now yields a false positive rate of  $100 \times (1 / 9) = 11.0\%$ .

So what about these official claims of the false positive rate being minuscule? Well, with test specificity stuck at the 'official' 99.9% you can only get down to a false positive report rate of 1% or lower if disease prevalence (pre-test probability) is up at 11% and beyond - try it out!

Thus, we see that these claims only hold true for substantial levels of disease. Since the latest official estimate for disease prevalence in England is down at 0.1% (REACT) then the official narrative simply doesn't hold up – you can't have 99.9% specificity, 0.1% prevalence \*and\* 1% false positive reporting, at least not in a universe where logic applies. What is unbelievable is the sheer number of experts (professional or home-spun) who don't understand the basic maths. I am hoping group members are now fully armed!

## Formulae for calculating false positive rate

$$\frac{(1 - P) \times (1 - \text{specificity})}{1 - \text{specificity} - P + \text{specificity} \times P + \text{sensitivity} \times P}$$

Where...

$P$  = pre-test probability (disease prevalence)

Specificity and sensitivity are expressed as fractional values (0.99) instead of percentages (99%)

$$\frac{(100 - P) \times (100 - \text{specificity})}{100^2 - 100 \times \text{specificity} - 100 \times P + \text{specificity} \times P + \text{sensitivity} \times P}$$

Where...

$P$  = pre-test probability (disease prevalence)

Specificity and sensitivity are expressed as percentages (99%) and not fractional values (0.99).

13<sup>th</sup> July 2021

### **Massive Missing Test Data**

This morning I have been cross-checking figures for tests and the number of people tested across NHS England using information downloaded from UK GOV and NHS England websites and have discovered a whole heap of records where the number of people tested exceeds the number of tests recorded – a physical impossibility! Either they've been double-counting people tested or they've failed to register all tests undertaken (or both).

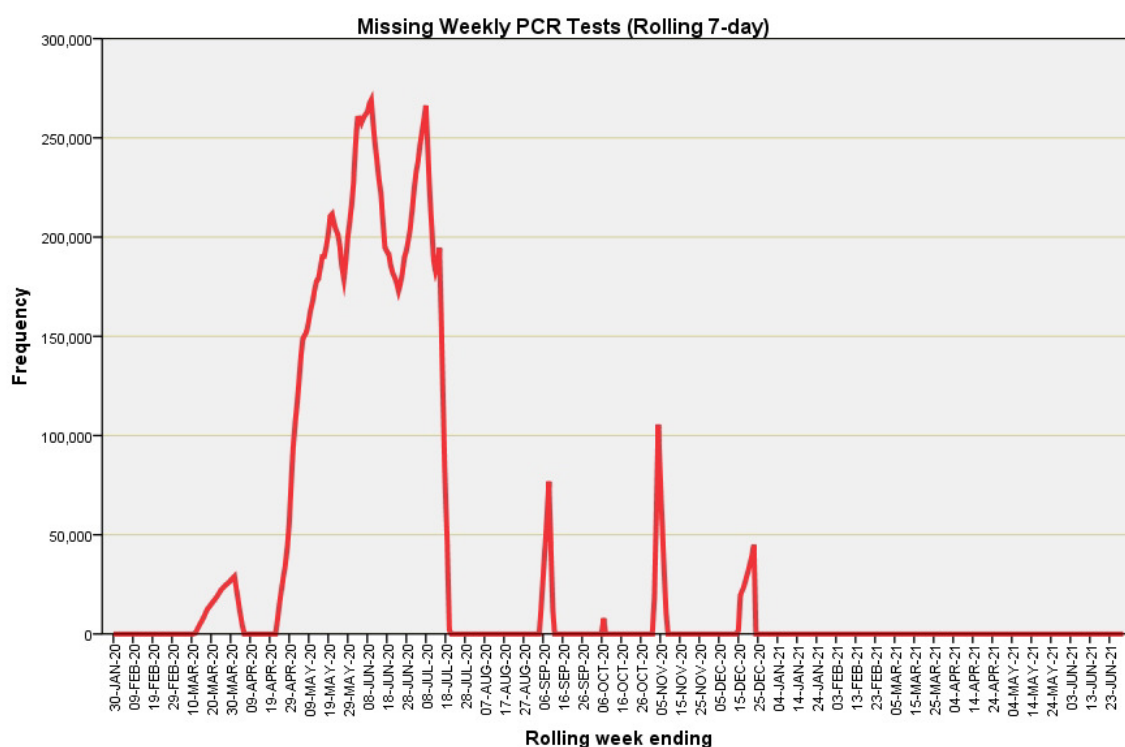
A glance at the test & trace weekly series reveals the problem lies with counting both pillar 1 and 2 test activity. For example, week 23 is showing 309,467 people tested under pillar 2 with a blank entry for tests. There's a massive hiccup for pillar 2 running w/b 26/3/2020 – 9/7/2020 that amounts to 2,910,453 more people tested than PCR tests undertaken. Pillar 1 runs into trouble from w/b 11/3/2021, with 1,586,695 more people registered as being tested than tests undertaken. This may well be due to de-duplication since the data definition notes state that folk tested under both pillars will only have one test counted, this being the pillar under which the earliest test was registered. The fact that the sum total for both pillars yields slightly more tests than people over this same period would suggest this is indeed the case.

Though a seemingly good idea what de-duplication across pillars is doing is greatly distorting any and all analyses by myself and others, including all official outputs. If you test a person twice within the space of a week instead of once then you double the chances of detecting a



positive case. Both of those tests need to be counted to avoid test rate bias, but if you de-duplicate the second test then we're one test down. The same principle applies to the handling of multiple tests whereby only the positive test result is counted; if it has taken 5 tests to get that positive result then all 5 tests must be counted to avoid testing bias otherwise we'll be calculating the case rate as 100% (1 in 1) instead of 20% (1 in 5). I dare not imagine the extent to which these two biases are generating fictional results across the population as a whole!

I've started on the painful process of rationalising this mess and attach a chart showing the weekly number of missing tests for pillars 1 and 2 combined. As we can see the lion's share of the problem lies back in May – July 2020. These missing tests will have greatly over-inflated official estimates of infection rates during that splendidly warm summer and I can't help but wonder if this was a deliberate attempt at manipulating the data.



Source: NHS England, UK GOV coronavirus dashboard

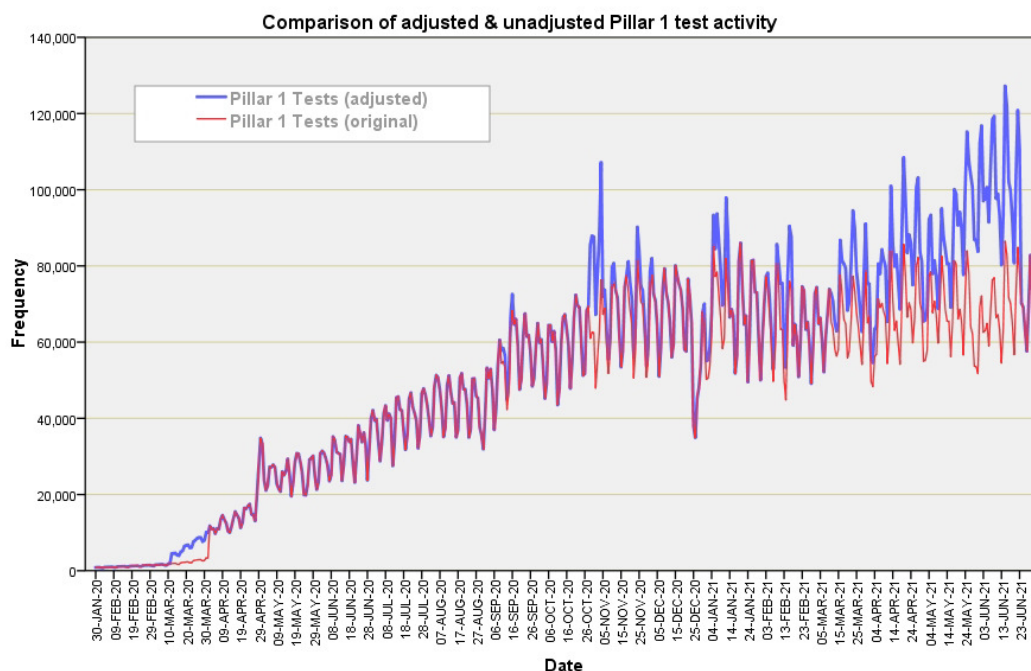
## Filling The Holes

I am pleased to report I am nearing the end of a mammoth hole-filling session that was aimed at reconciling test and head count differences between NHS test & trace and UK GOV dashboard records. The problem has been with the dashboard data and in particular with the de-duplication techniques they are applying, these being confounded by introduction of LFD kits. These techniques make sense for those wishing to simply eyeball headline figures but if you want to accurately estimate disease prevalence by pillar or evaluate PCR test performance they seriously put a spanner in the works by introducing substantial amounts of test bias.

This bias comes about by removing instances of testing through de-duplication, the most extreme expression being a series called `uniquePeopleTestedBySpecimenDateRollingSum` which is utterly pointless - if my next door neighbour was tested once last year and was tested once again this year we really need to count both instances! If a kid gets poked up the nose 3 times a week at school we need to count all of those instances because each instance increases the chance of returning a positive test. By way of example, a 10-week school term at 3 pokes per week for a single kid yields 30 instances whereby the virus stands a chance of being detected – de-duplication by test & trace week reduces this to just 10 records. Thus, if the last test of term popped up positive the authorities would calculate the rate as 1 in 10 and not 1 in 30. This is pretty elementary stuff and I am certain they are fully aware of this.

As for corrections made by my fair hands the biggest difference lies in pillar 1 test count since the de-duplication algorithm of selecting the earliest test is naturally favouring pillar 2 results, especially following the mass introduction of self-testing last October. Many folk now self-register a pillar 2 test result which means a later pillar 1 test result (dentist, outpatients, minor A&E, diagnostic, routine procedures etc) gets clobbered.

In the attached slide you can see this difference for yourselves. There's a slight wrinkle back in Mar 2020 as the data authorities got their act into gear, after which NHS and UK GOV sources match perfectly right up to a glitch around 26 Oct 2020, which coincides with the introduction of LFD testing. The de-duplicated dashboard data downloaded from UK GOV reckons a modest amount of pillar 1 took place (red line) but Test & Trace calibrated data (blue line) suggests otherwise. Data capture settles down nicely again until Mar 2021 when we see significant divergence between sources. This divergence was identified via simple comparison such that we'd expect 20,000 tested people to have had at least 20,000 tests by definition. When my brain is less than mush I'll double-check my methods to ensure I've got the right end of the swab! What makes me think I've likely poked the correct end is that we don't see this difference for pillar 2 testing.



Source: UK GOV coronavirus dashboard; NHS England Test & Trace

14<sup>th</sup> July 2021

## Test Rate Bias (TRB)

This morning I am going to thrash through this topic again because it leads to critical adjustments we must make to the data if we are to undertake any and all historic analyses of COVID cases. We shall start with a simple example of 100 people going for PCR testing during June.

Let us, for the sake of example, suppose that the chances of detecting a positive case from a PCR test are 2%. If our 100 people go for just one test during June then we'll get 100 test results, two of which are likely to be positive. If our 100 people decide to go for two tests during June then we'll have 200 test results, four of which are likely to be positive. Although June is still June and our 100 people are still 100 people, the number of cases has doubled simply because they decided to test a second time and not because the disease has spread.

In the first instance 100 tests undertaken by 100 people during June gives us a test rate of  $100 / 100 = 1.00$  tests per person. In the second instance 200 tests undertaken by 100 during June gives us a test rate of  $200 / 100 = 2.00$  tests per person. To arrive at the unbiased case count for June we have to divide the number of cases detected by the test rate, and shall note that the first instance gives us  $2 / 1.00 = 2$  cases per test per person and the second instance gives us  $4 / 2.00 = 2$  cases per test per person.

Now imagine the first instance took place in June but the second instance took place in July – unless we account for the higher test rate for July and simply count test results it will look like the disease is spreading and doubling in number when it is not; all that has happened is our 100 have become more enthusiastic! We thus see that until we account for the testing rate for individuals we cannot say anything about infection rates.

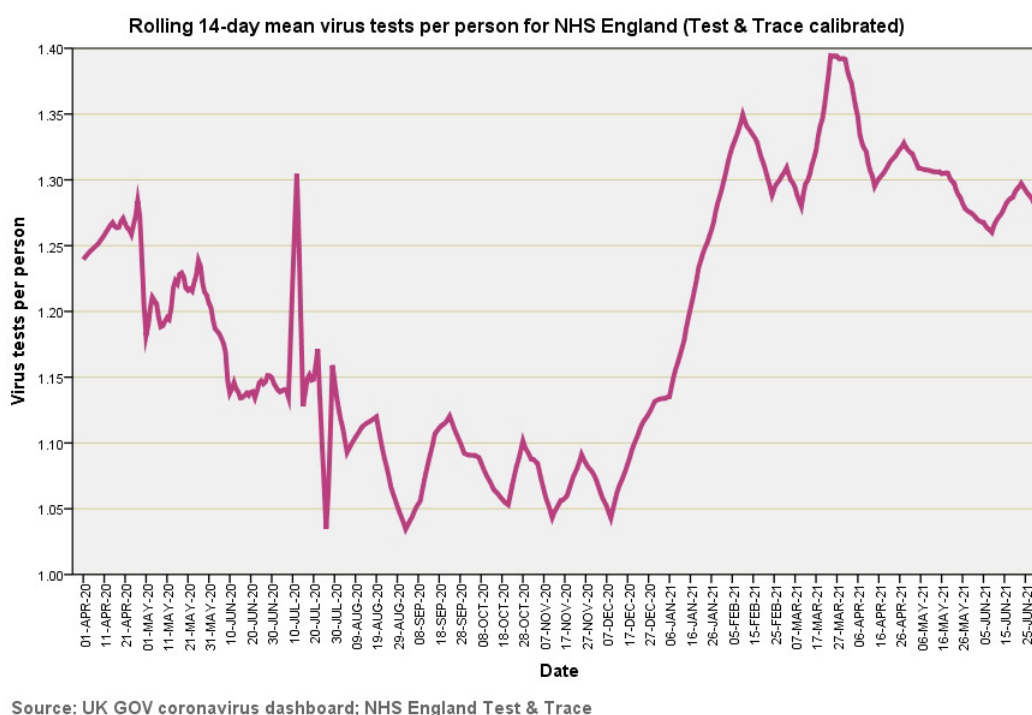
Whilst we cannot easily track individuals what we can do is look at the testing trends within the population as a whole by dividing the number of tests undertaken by the number of people taking them. This is precisely what I have done to produce the attached slide using daily data for

NHS England. The only difference here is that I used 14-day rolling counts of tests and people tested to smooth out any administrative wrinkles.

We now see virus tests per person start at around 1.25 per 14-day period back in April 2020 before dropping to around 1.05 virus tests per person. The sudden climb to around 1.30 virus tests per person during Dec 2020 – Jan 2021 will have generated a large number of cases for no reason other than there are more test results to consider! Any genuine increase in COVID infection rates that may also have occurred will have been utterly swamped by this bias. We can get a handle on this bias by dividing 1.30 by 1.05 to arrive at a factor of 1.238, which means we may expect a 23.8% increase in the number of cases simply because people decided to get tested more often and not because COVID was spreading.

The good news is we can use this data to make corrections to case counts over time that will arise from nothing more than variations in the testing rate. Whenever you see the word ‘adjusted’ in my slides or the phrase ‘test bias adjusted’ this is precisely what I have done. In fact, the exact calculation I make is adjusted cases = observed cases x (1/test rate), being a simple correction which normalises case counts to what we might expect if everybody took just one test and only one test in every relevant time period (day, week, fortnight, month).

Without this basic correction we have no idea whether the variations we see are due to testing preference or something the virus is doing. As far as I can ascertain no data authority and no expert organisation is making this basic correction, though they must all be fully aware of the situation.



### ***Minimum Theoretical Test Specificity (MINTS)***

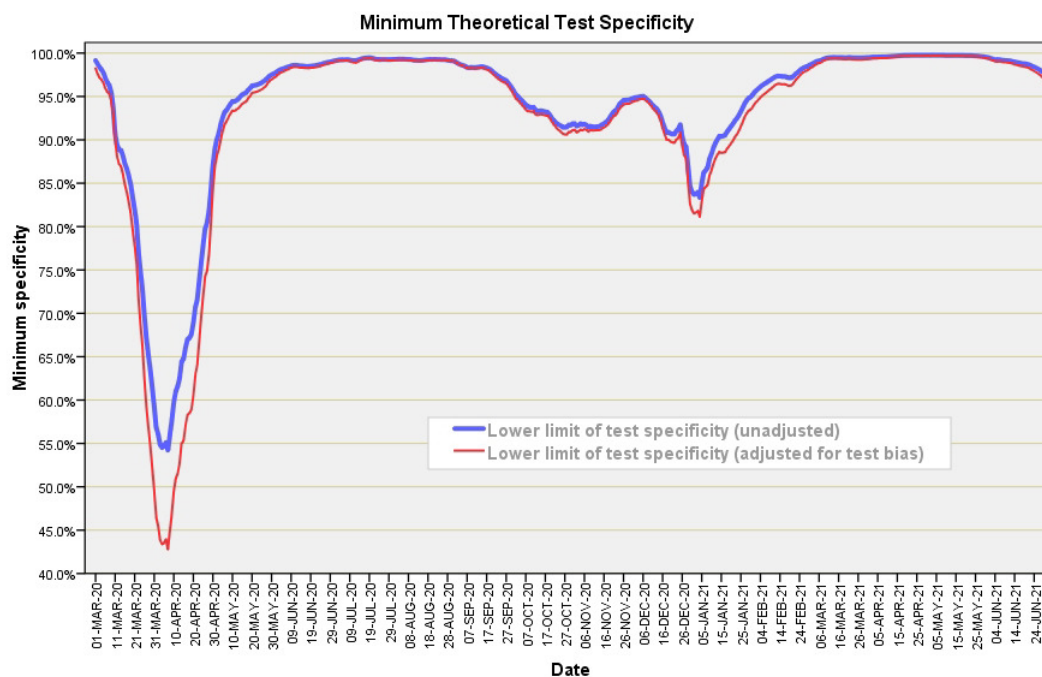
I’ve had a few good arguments with folk who grumble that my supposition of 97% for PCR test specificity is not supported by evidence, with some arguing that the test and trace numbers alone prove I’m talking out of my bottom. I admit that 97% is mere supposition but in the face of total lack of evidence concerning real world (working lab) specificity it’s an educated guess I’ve made. The nominal figure is claimed to be 99.9% but this is one of those bench-marked figures produced by test manufacturers that starts to smell fishy the more you probe into their methodology. Some frontline clinical colleagues with test experience suggest the figure may be as low as 95%, so I guess I’ve pretty much split the difference.

After one particular argument I sat wondering if there was a way of mathematically determining whether I was talking out of my bottom or not, and that’s when I formulated the minimum theoretical test specificity (MINTS). In plain English this is the lowest possible value the test specificity can be assuming 0% disease prevalence with positive cases popping (100% false positive rate). After playing with some real world test & trace numbers in Excel I discovered that the minimum theoretical test specificity is simply  $100 - \text{disease prevalence}$ , such that if prevalence is down at 1% then MINTS is up at 99%.

Now the darn interesting thing here is that MINTS is influenced by TRB (Test Rate Bias) – please see my previous post on the matter. In the attached slide I offer two estimates for MINTS using my newly established test & trace calibrated daily data. As you can see the blue line hugs

99% - 100% minimum specificity for extended periods, with the mean and median since 1st March 2020 fetching up at 93.94% and 97.71% respectively. If we now account for TRB (red line) we see something slightly different with a series median of 97.12% and series mean of 92.75%. This suggests my 97% guesswork isn't too shabby (my bottom is reasonably clean) but, arguably more important than a clean bottom, is that this analysis reveals you have to be careful what period you choose to determine MINTS. Back in January 2021 MINTS dropped to 85% or thereabouts and even dropped to 45% - 55% when things were exploding back in March 2020.

All this is based on the assumption that the test is doing something useful instead of acting like a random number generator, there being evidence in support of this alarming hypothesis in previous posts. Because we use PCR to determine point prevalence (serological testing only reveals accumulated history) then we have a serious case of chicken and egg, dog chasing tail or something disappearing up its own bottom. PCR is the test that tested itself.



Source: UK GOV coronavirus dashboard

15<sup>th</sup> July 2021

## Calibrating Test Specificity

No clinical diagnostic test is perfect and all tests give rise to both true and false results. Under ideal circumstances a person carrying a disease will be given a positive test result (true positive) and a person not carrying a disease will be given a negative test result (true negative). However, in the real world errors occur and a person carrying a disease will be given a negative test result (false negative) and a person not carrying a disease will be given a positive test result (false positive). Every single diagnostic test available will generate all four of these outcomes in varying quantities, including PCR.

How these four outcomes crop up in PCR test use depends on something called test sensitivity (how good the test is at detecting presence of the virus), test sensitivity (how good the test is at detecting absence of the virus) and disease prevalence (how much of the population is carrying infectious virus). Bizarre as it may seem we don't precisely know what the actual test sensitivity and specificity is for PCR, though there are nominal estimates in circulation of 80% sensitivity and 99.9% specificity.

With a disease prevalence of 0.1% (1 in 1000 people carrying infectious virus), sensitivity of 80% and specificity of 99.9% we may expect the false positive reporting rate to hit 55.5%; that is, we may expect 55.5 out of every 100 positive test results to be false. With a specificity just 0.9% less at 99.0% we may expect the false positive reporting rate to hit 92.6%; that is, 92.6 out of every 100 positive test results will be false. It is thus critical to accurately determine test specificity if we are to establish exactly what is going on in the quieter stages of the pandemic.

In the absence of any robust real world estimates for specificity I wondered if it would be possible to get a handle on matters using death as the ultimate disease outcome – if there's no disease about there's no COVID death and vice versa. For this purpose I chose the daily time series for 28-day COVID positive deaths within England and the time series for deaths where COVID is entered on the death certificate.

To get a handle on how much disease there is about across England I derived four time series for disease prevalence, each adjusted for false positive reporting for a different nominal level of test specificity (99.9%, 97%, 95% and 90%). These series were then used as independent predictors in ARIMA (Autoregressive Integrated Moving Average) modelling of both 28-day and certified COVID death.

The idea here is simple – if COVID is killing people then we should be able to predict deaths from how much disease there is about (disease prevalence). The sneaky move is to see which of the four false positive adjusted series is the best predictor of COVID death for this will then reveal the most realistic level for test specificity. I'd like to think this is darn cunning but then I'd be blowing my own cornetto.

Instead of providing reams of statistical output and waffle I've boiled the answer down into one simple, colour-coded Excel table. In this table you will see four standard measures of goodness-of-fit (how well the predictive model fits the data) called stationary R-square, RMSE, MAPE and MAE - I can explain what these mean for interested folk in the comments section. You'll also see the four levels of test specificity used for false positive adjustment of disease prevalence along with a baseline model (no independent predictor). Those cells shaded green pick out the best fitting model and those cells shaded pink pick out the worst fitting model.

We now see that for each and every goodness-of-fit measure a test specificity set at the accepted nominal value of 99.9% produced the worst fitting model to daily certified and 28-day COVID death. In plain English the bench-mark claim of 99.9% for test specificity is pretty much utter tripe when it comes to the messy business of assay in the real world. What took me by surprise are green shaded cells down at 90.0% and 95.0% specificity, with 90.0% boasting two such shaded cells. Wow indeed!

Using our original example of a disease prevalence of 0.1% (1 in 1000 people carrying infectious virus), sensitivity of 80% and specificity of 90.0% we may expect the false positive reporting rate to hit 99.2%; that is, we may expect 99.2 out of every 100 positive test results to be false. We are wading in illusion and both the government and their 'experts' will be fully aware of this.

**ARIMA Modelling of Certified COVID deaths & 28-day COVID positive deaths**  
1st April 2020 - 30th June 2021  
Independent predictor: False positive adjusted disease prevalence (rolling 7-day)

| Mean goodness-of-fit (2 models) | Stationary R-squared | RMSE   | MAPE   | MAE    |
|---------------------------------|----------------------|--------|--------|--------|
| Baseline model                  | 0.111                | 27.493 | 19.838 | 16.894 |
| Test specificity 90.0%          | 0.224                | 23.866 | 18.827 | 14.966 |
| Test specificity 95.0%          | 0.226                | 23.880 | 18.822 | 14.973 |
| Test specificity 97.0%          | 0.227                | 23.912 | 18.833 | 14.983 |
| Test specificity 99.9%          | 0.222                | 24.032 | 18.979 | 15.033 |

16<sup>th</sup> July 2021

## Calibrating Test Specificity Using Hospital Activity

Yesterday in a post entitled Calibrating Test Specificity I introduced a statistical technique whereby we could use daily counts of certified and 28-day COVID deaths since 1<sup>st</sup> April 2020 as a method for calibrating PCR test specificity within ARIMA multivariate time series analysis, the idea being to see which of four false positive adjusted estimates for disease prevalence fared the best in prediction of COVID death. We discovered that the false positive-adjusted prevalence series based on 99.9% nominal test specificity, as touted by test manufacturers, fared the worst in the prediction of COVID death, and raised an eyebrow at the performance of the 90.0% specificity series.

Some excellent questions and points were made in comments and so this morning I decided to expand on this analysis by looking at six more outcome indicators within NHS England, these being daily COVID admissions to hospital, daily inpatients testing positive, daily COVID designated beds, daily COVID designated mechanical ventilation (MV) beds, fraction of COVID general beds and fraction of COVID MV beds.

This is where our eyebrows must rise skyward once again for I was fully expecting disease prevalence, at more or less any level of adjustment for false positive reporting, to be strongly correlated with these six measures of hospital activity over time. This is not the case and I summarise the catastrophic failure in a tabulation of the six dependent measures against the four independent series, revealing probability values attained. This is quite bizarre for we have either a highly statistically significant result ( $p < 0.001$ ) or complete non-significance; that is to say either disease prevalence is an excellent predictor or it is completely pointless.

How is it possible that disease prevalence can be utterly pointless as a predictor of COVID hospital activity? The only rational explanation I can muster is that hospital activity that is designated as 'COVID' and being counted as such is independent of disease levels within the population as a whole and is thus clinically meaningless. This is precisely the nonsensical situation you'll get if you rely on a positive swab to determine a



‘case’ instead of qualified clinical judgement. It’s also an artefact of running PCR at maximum cycle thresholds beyond 28; NHS Trusts have effectively shot themselves in the foot (unless it is more lucrative to do ‘health business’ this way).

It is worth noting what disease prevalence can actually predict. In this regard disease prevalence is jolly good at predicting positive test results among inpatients who were already in hospital for other reasons. Linked to this, of course, is the fraction of general beds designated as COVID. As I’ve said before COVID is not a ‘front door’ disease and here is yet more proof. What we have here is evidence of an institutional testdemic.

There are two intriguing results in this table, these being the ability of 90% and 95% FPR-adjusted disease prevalence to predict front door medicine (daily COVID admissions to hospital). This once again suggests that PCR test specificity, in the real world of messy assay and working laboratory, is far lower than the nominal 99.9% proffered by test manufacturers.

| Dependent Time Series:                             | False positive adjusted disease prevalence |         |         |         |
|----------------------------------------------------|--------------------------------------------|---------|---------|---------|
|                                                    | Nominal Test Specificity                   |         |         |         |
|                                                    | 90%                                        | 95%     | 97%     | 99.9%   |
| Daily COVID admissions to hospital                 | p<0.001                                    | p<0.001 | n/s     | n/s     |
| Daily inpatients testing positive                  | p<0.001                                    | p<0.001 | p<0.001 | p<0.001 |
| Daily COVID designated general beds                | n/s                                        | n/s     | n/s     | n/s     |
| Daily COVID designated mechanical ventilation beds | n/s                                        | n/s     | n/s     | n/s     |
| Daily COVID general bed fraction                   | p<0.001                                    | p<0.001 | p<0.001 | p<0.001 |
| Daily COVID mechanical ventilation bed fraction    | n/s                                        | n/s     | n/s     | n/s     |

*n/s = not significant at 95% level of confidence ( $p>0.05$ )*

## Calibrating Test Specificity (TCM)

In posts entitled Calibrating Test Specificity and Calibrating Test Specificity Using Hospital Activity I reveal the results of ARIMA multivariate time series modelling to determine likely real world values for PCR test specificity using COVID death and COVID hospital activity as calibration measures. We discovered that values of 90% and 95% specificity were likely to be closer to the truth than the nominal 99.9% established by test manufacturers. We also discovered a substantial disconnect between several measures of hospital activity and disease prevalence, such that hospital ‘cases’ that are labelled as such are likely not genuine cases but mere artefact of a test churning out a high percentage of false positives at cycle thresholds beyond those recommend by MIQE (Minimum Information for Publication of Quantitative Real-Time PCR Experiments), and WHO since their notification dated 14<sup>th</sup> December 2020. With hospital activity exhibiting a somewhat tenuous relationship with disease prevalence I decided to place my focus on COVID death as the yardstick once more

To cross-check my earlier conclusions I adopted a rather powerful analytical tool called temporal causal modelling (TCM), this being an IBM SPSS implementation of Granger Causality (please see Wiki for explanation). TCM determines if an independent series is a likely Granger causal predictor of a dependent series, offering significance testing along with many other useful features. The two dependent series subject to TCM were daily certified COVID death and daily 28-day COVID positive death, with four independent (predictor) series being FPR-adjusted disease prevalence assuming 99.9%, 97%, 95% and 90% test specificity.

TCM output within IBM SPSS is both colourful and copious but I have elected to reveal the nitty gritty core of this, being a somewhat boring tabulation of significance values attained for each independent series in the prediction of COVID death. A useful aspect of this provision of F values (please refer to Wiki/F-test for an explanation) so we may judge how well independent series perform in relation to each other. Unlike classic partitioning of variances in a fixed manner TCM is an iterative process whereby different combinations of the multiple independent series forming the model system are tested such that differences between multiple predictors and dependents are minimised. Final tabulations are thus indicative of best possible fit for the system under test.

In the attached screenshot of actual output we get to see which FPR-adjusted series for disease prevalence cuts the mustard and which does not. The mouthful that is newDailyNsoDeathsByDeathDate is the dependent variable certified COVID deaths, with newDeaths28DaysByDeathDate doing what it says on the tin! We now see that the series representing FPR-adjusted disease prevalence assuming a nominal 99.9% test specificity (PrevalenceFPR99\_adj) fails to reach statistical significance in the prediction of COVID certified death ( $p=0.811$ ) and fails to reach statistical significance in the prediction of 28-day COVID positive death ( $p=0.507$ ), falling foul of three other series that offer superior predictive ability. The winner of this four-way variance contest is FPR-adjusted disease prevalence assuming a nominal 90% test specificity (PrevalenceFPR90\_adj), with p-values attaining  $p<0.001$  in the prediction of both dependents. The F-values in the middle column tell an interesting story in their own right for we see a gradual decline in value from 90% downward, this giving us an insight into the ordering of goodness-of-fit.

What does all this mean in plain English? It means that if you want to predict daily certified COVID death or daily 28-day COVID positive death using daily FPR-adjusted disease prevalence then your best bet is to adjust for false positive reporting based on 90% test specificity and not

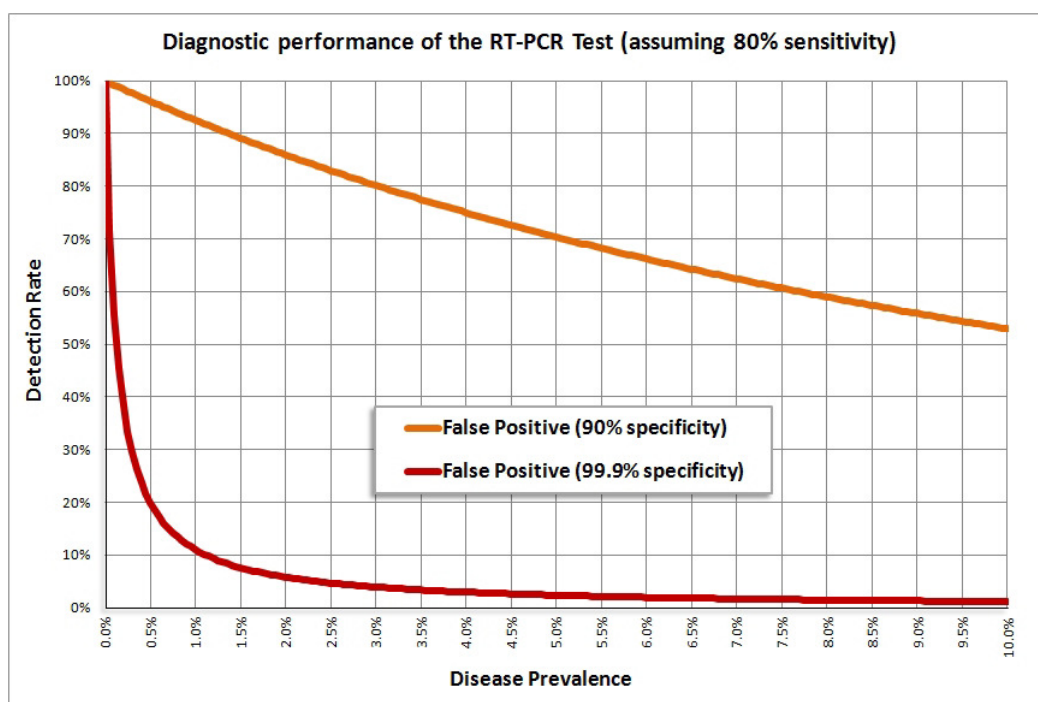


99.9% specificity as claimed by test manufacturers. The difference this makes is revealed in the second slide where I plot out false positive reporting rates over a range of disease prevalence for both 99.9% and 90% test specificity for an assumed nominal 80% sensitivity.

Ward et al (SARS-CoV-2 antibody prevalence in England following the first peak of the pandemic. Nature Communications 12, Article number 905. 2021) estimated a peak prevalence of 6% for England as the pandemic broke. Using this as a yard stick for novel infection we can see that, at best, the false positive reporting rate never actually got below 65% at a time when authorities and any and all experts that were permitted to speak to camera were claiming FPR to be negligible. I'm pretty sure all of these experts were always fully away of the situation, which is probably why a concerted effort to determine PCR test parameters by independent assay was never allowed to take place.

| newDailyNsoDeathsByDeathDate |         |      |
|------------------------------|---------|------|
| Input Series                 | F       | Sig. |
| newDailyNsoDeathsByDeathDate | 3681.55 | .000 |
| PrevalenceFPR90_adj          | 4.96    | .000 |
| PrevalenceFPR95_adj          | 3.37    | .005 |
| PrevalenceFPR97_adj          | 2.32    | .043 |
| PrevalenceFPR99_adj          | .45     | .811 |
| df1 = 5, df2 = 425           |         |      |

| newDeaths28DaysByDeathDate |         |          |
|----------------------------|---------|----------|
| Input Series               | F       | Sig.     |
| newDeaths28DaysByDeathDate | 4309.27 | .000     |
| PrevalenceFPR90_adj        | 6.52    | 7.449E-6 |
| PrevalenceFPR95_adj        | 4.75    | .000     |
| PrevalenceFPR97_adj        | 3.48    | .004     |
| PrevalenceFPR99_adj        | .86     | .507     |
| df1 = 5, df2 = 425         |         |          |



19<sup>th</sup> July 2021

### Take Your Pick

It has been argued that I am a source of misinformation regarding test specificity, and to prove it an unknown personage has quoted some figures from an ONS report stating:

... in the six-week period from 31 July to 10 September 2020, 159 of the 208,730 total samples tested positive. Even if all these positives were false, specificity would still be 99.92%.

Let us now use this exact same argument for determining minimum test specificity and apply it to weekly data obtained from NHS England Test & Trace, broken down by pillar. Well, isn't that interesting? Depending on the time period we choose we can get specificity as high as 99.8% or as low as 66.7% by using the same calculation. Take your pick.

We may argue that the lean summer months are the best time of year to determine specificity because there isn't much disease about, so the false positive rate is likely to be 100%. This is like arguing that it's safe to put out on winter seas in a canoe on the basis that it was calm when paddling in the summer i.e. our treasured value of 99.92% summer specificity is likely to falter when the going gets tough with cross contamination, viral fragments, dead virus all kicking in. The trouble is we'll never know because we don't have an independent gold standard with which to calibrate PCR.

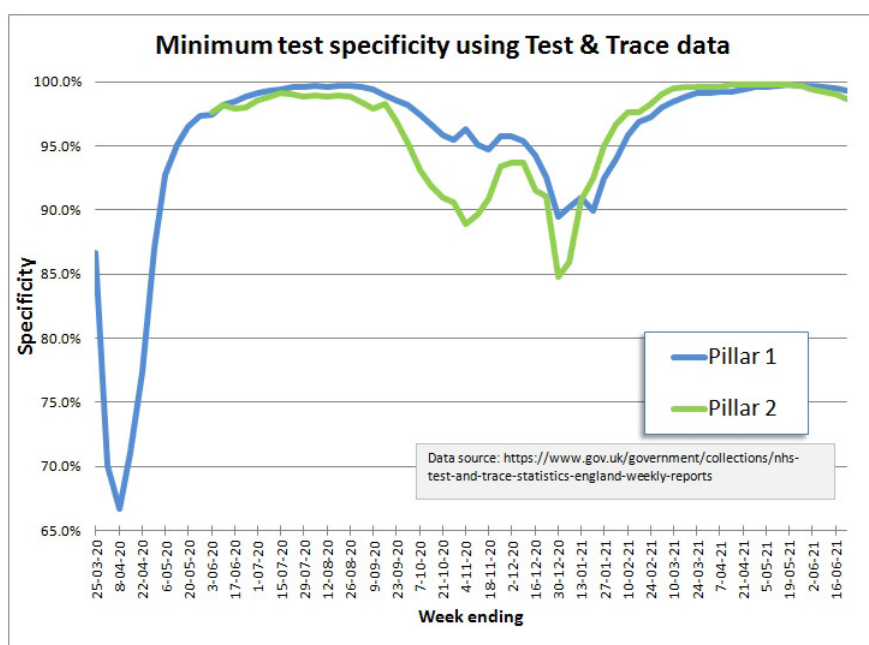
If those 159 were true positives then we'd have zero false positives in 208,730 samples, which would lead us to conclude test specificity is 100.00%. This is clearly ridiculous and so we can conveniently hide behind a few useful test results whose veracity can only be inferred since we have no way of cross-checking. In short we're waving straws in the air and claiming something is real when it is mere inference.

Then there's the bottom line of 208,730 samples. I'd like to remind folk that, according to data definitions on the UK GOV dashboard, null and void test samples are still counted as samples. How many of those 208,730 samples were void tests? Either we play this game correctly by adjusting the denominator for void tests or we do not!

Yet void tests are only the tip of the iceberg – there's something called an indeterminate test result. An indeterminate test result is where PCR cannot fathom whether the SARS-COV-2 signature (as defined using 2 or 3 primers) is present or not. Though not a void test, it is a test result that cannot usefully contribute to the pool of declared positive and negative results. Because it cannot contribute it cannot sensibly be applied to estimates of sensitivity or specificity (both being measures of discrimination) – this is like me stuffing cotton wool in my shirt to give me bigger biceps. If we want to play a straight bat then both void and indeterminate test results must be removed from the sample pool so we may see the results of PCR working in a true discriminatory manner.

So where does all this leave us? Well, still guessing, and basically using the results of a test to verify the results of the same test in the absence of a gold standard or even agreement on symptoms. With pregnancy there's a rather wonderful gold standard we can use to calibrate test performance – we call it a baby. With staphylococcus there's another wonderful gold standard we can see swimming on a petri dish. Not so with SARS-COV-2 whose presence is primarily detected by PCR.

So where does this leave me? Well, it leaves me trying to develop a gold standard using clinical outcomes like admissions to hospital, mechanical ventilation bed use and certified COVID death. So far these are pointing away from 99.9% and pointing to 95% - 90%. We can either ask why this is so or we can ignorantly claim I'm spreading misinformation.



## Calibrating Test Specificity (80% & 85% specificity)

We've been on a steady journey these last few posts, the core theme of which has been test specificity. We don't know what this is because we don't have a gold standard with which to conduct an independent assay. We know what the test manufacturers say and we can attempt to infer specificity from counting test results. This is not unlike a high court judge directly asking the accused if they are innocent instead of relying on cross examination in front of a jury.

We have been surprised to see the nominal but somewhat official 99.9% bite the dust in a statistical contest using FPR-adjusted disease prevalence as a predictor for COVID death and hospital activity in both ARIMA time series analysis and Temporal Causal Modelling (TCM), with the performance of 95% and even 90% test specificity raising an eyebrow.

A group member sensibly asked if it was worth pursuing values lower than 90% and, of course, I could not resist! This is a jolly good idea because we might be able to bracket the likely 'true' value for test sensitivity (whatever a 'true' value of anything ever means) and we might determine if something is going badly amiss with my methodology if it turns out that 80% or lower is out performing anything higher (no bottom bracket).

What I've done, therefore, is to run all ARIMA/TCM analyses again using disease prevalence adjusted for 85% and 80% test specificity to see how those key tables square up with a bigger bottom end. I now present them as two conglomerate slides. Taking the top section summary for ARIMA modelling of certified COVID and 28-day COVID positive death (slide #1) we now see that 80% joins 99.9% in being the poor cousins notching up pink squares denoting fits that are not quite up to the standard of the rest (though differences are minimal). If I were to pick a green-tinged winner it would be 90%, with minimal values for RMSE and MAE.

Flipping to the lower section of slide #1 we see daily inpatients testing positive and daily COVID general bed fraction doing their usual we-are-COVID thing with no sign of discrimination among values for specificity – a finding worth noting in its own right, for it suggests any old specificity will do when it comes to bums on beds. No clinical discernment of cases there, I fear! After that we've got a raft of significant results for 95% and below when it comes to folk coming through the front door, and a curious finding for MV bed use and 80% specificity.

The key results of TCM are presented in slide #2, with the top table showing results for the prediction of certified COVID death and the bottom table showing results for the prediction of 28-day COVID positive death. This really is a punch-up with six independent series all vying to be the best predictor of COVID death. The official value of 99.9% once again melts into insignificance in the prediction of certified death ( $p=0.5453$ ), and in the prediction of 28-day COVID positive death ( $p=0.8887$ ), but this time it is joined by my old favourite of 97% that also bites the dust ( $p=0.1108$ ). Who, then, should we turn to for our new champion? Well, it sure looks to me like 90% specificity is cutting the mustard and calling the shots, with the heftiest F-values around. Yee-Haw!

This is good news in that we have a bottom bracket and a specificity that might just reflect the real world when the real world gets messy. The head scratcher is, with specificity as low as 90%, why we don't get to see more positives fetching up whenever people are tested? Answers on a post card, please – solve this and we solve the mystery, otherwise I must remain Mr Misinformation!

### ARIMA Modelling of Certified COVID deaths & 28-day COVID positive deaths

1st April 2020 - 30th June 2021

Independent predictor: False positive adjusted disease prevalence (rolling 7-day)

| Mean goodness-of-fit (2 models) | Stationary R-squared | RMSE   | MAPE   | MAE    |
|---------------------------------|----------------------|--------|--------|--------|
| Baseline model                  | 0.111                | 27.493 | 19.838 | 16.894 |
| Test specificity 80.0%          | 0.220                | 23.894 | 18.842 | 14.975 |
| Test specificity 85.0%          | 0.222                | 23.876 | 18.834 | 14.966 |
| Test specificity 90.0%          | 0.224                | 23.866 | 18.827 | 14.966 |
| Test specificity 95.0%          | 0.226                | 23.880 | 18.822 | 14.973 |
| Test specificity 97.0%          | 0.227                | 23.912 | 18.833 | 14.983 |
| Test specificity 99.9%          | 0.222                | 24.032 | 18.979 | 15.033 |

| Dependent Time Series:                             | False positive adjusted disease prevalence (rolling 7-day) |           |           |           |           |           |
|----------------------------------------------------|------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|
|                                                    | Nominal Test Specificity                                   |           |           |           |           |           |
|                                                    | 80%                                                        | 85%       | 90%       | 95%       | 97%       | 99.9%     |
| Daily COVID admissions to hospital                 | $p<0.001$                                                  | $p<0.001$ | $p<0.001$ | $p<0.001$ | n/s       | n/s       |
| Daily inpatients testing positive                  | $p<0.001$                                                  | $p<0.001$ | $p<0.001$ | $p<0.001$ | $p<0.001$ | $p<0.001$ |
| Daily COVID designated general beds                | n/s                                                        | n/s       | n/s       | n/s       | n/s       | n/s       |
| Daily COVID designated mechanical ventilation beds | $p=0.032$                                                  | n/s       | n/s       | n/s       | n/s       | n/s       |
| Daily COVID general bed fraction                   | $p<0.001$                                                  | $p<0.001$ | $p<0.001$ | $p<0.001$ | $p<0.001$ | $p<0.001$ |
| Daily COVID mechanical ventilation bed fraction    | n/s                                                        | n/s       | n/s       | n/s       | n/s       | n/s       |

n/s = not significant at 95% level of confidence ( $p>0.05$ )

| newDailyNsoDeathsByDeathDate |         |       |
|------------------------------|---------|-------|
| Input Series                 | F       | Sig.  |
| newDailyNsoDeathsByDeathDate | 3690.20 | .0000 |
| PrevalenceFPR80_adj          | 5.79    | .0000 |
| PrevalenceFPR85_adj          | 4.24    | .0009 |
| PrevalenceFPR90_adj          | 6.23    | .0000 |
| PrevalenceFPR95_adj          | 5.84    | .0000 |
| PrevalenceFPR97_adj          | 3.51    | .0040 |
| PrevalenceFPR99_adj          | .81     | .5453 |

df1 = 5, df2 = 415

| newDeaths28DaysByDeathDate |         |       |
|----------------------------|---------|-------|
| Input Series               | F       | Sig.  |
| newDeaths28DaysByDeathDate | 4027.26 | .0000 |
| PrevalenceFPR80_adj        | 3.79    | .0023 |
| PrevalenceFPR85_adj        | 3.15    | .0084 |
| PrevalenceFPR90_adj        | 5.05    | .0002 |
| PrevalenceFPR95_adj        | 3.44    | .0046 |
| PrevalenceFPR97_adj        | 1.80    | .1108 |
| PrevalenceFPR99_adj        | .34     | .8887 |

df1 = 5, df2 = 415

19<sup>th</sup> July 2021

## Medical vs Laboratory Test Specificity

In my previous post entitled Calibrating Test Specificity (80% & 85% specificity) I ended my statistical probing with the good news that I'd found a bottom bracket to real world specificity – it certainly wasn't as low as 80% or even 85%. However, like guzzling too much cheap booze on a hot day, I was left with a hangover of a puzzle: with statistical analysis of clinical outcomes suggesting a real world test specificity possibly as low as 90%, why we don't get to see more positives fetching up whenever people are tested?

After two cold beers and a tasty wrap the answer oozed out like the chilli sauce between my fingers – we are lumping together two different paradigms wrt specificity! Everybody knows that PCR is darn good at detecting genetic sequences – too good, in fact - such that we can detect one strand of viral RNA within a swab. We can estimate viral loads from cycle threshold values so we get to know who is swimming in viral RNA and who is not. What we don't know in all this is whether the swabbed person is actually infectious or whether they are mildly or seriously ill. A test whose sole output is positive/negative/indeterminate tells us sod all about likely clinical outcome – this is when I realised we had to distinguish between medical and laboratory specificity.

Laboratory specificity is concerned with test dynamics, such that the infamous 159 cases in 208,730 total samples in the six-week period from 31 July to 10 September 2020 points to a mathematical minimum laboratory specificity of 99.92%. The laboratory we call our body will have a different idea of false and true positive regardless of lab test result and will thus react with its own idea of sensitivity and specificity that I am calling 'medical'. In this regard some bodies will treat a positive test result as though negative (and vice versa) and thus offer up a lower medical specificity than that concerned with detection. Another way to look at this is specificity of input (viral presence) vs. specificity of output (clinical outcome).

With this distinction in mind I set out this fine morning to establish best estimates for laboratory specificity. To do this I took my MINTS data series (minimum theoretical test specificity – please refer to earlier posts) and selected two stable reference periods for minimal disease prevalence, these being 1<sup>st</sup> July – 31<sup>st</sup> August 2020 and 1<sup>st</sup> April – 31<sup>st</sup> May 2021. Levene's test for equality of variances across the two periods yielded  $F = 0.607$ ,  $p=0.437$ , which got us off to a good start with confirmation of selection of two similarly behaving periods. However, a t-test for equality of means indicated the mean period difference of 0.432% to be highly statistically significant ( $p<0.001$ ), with the mean for 2021 (99.69%) outgunning the mean for 2020 (99.26%). Obviously the precise selection of reference period will make a substantial difference.

In terms of 95% confidence intervals we find 99.24%; 99.27% for 2020 and 99.67%; 99.71% for 2021, though we must note the distribution of daily values, despite being Normal-like, did not pass muster in a Kolmogorov-Smirnov test of Normality (Statistic = 0.128,  $df=62$ ,  $p=0.013$  for 2020 and Statistic = 0.221,  $df=61$ ,  $p<0.001$  for 2021). In terms of a grand mean generalised linear modelling with gamma distribution assumptions and identity link yielded an overall estimated mean of 99.47% (standard error = 0.0071%) with a Wald confidence interval of 99.46%; 99.49%.

It is interesting to note these means and their confidence intervals are considerably less than the 99.92% point estimate claimed by ONS for the period 31 July to 10 September 2020, and we may wonder just how much genuine effort they put in to obtain a robust estimator of minimum test specificity. The answer appears to be none – they simply went with a single period that supported the narrative.

Does this make any difference? With a disease prevalence estimated by the REACT study to be hovering around 0.1%, then 99.92% specificity, as determined by ONS, is expected to yield a false positive report rate of 50.0%. The overall grand mean specificity of 99.47% derived from my study is expected to yield a false positive report rate of 86.9% so, yes, it makes a difference! If we take the lower confidence value of 99.24% for 2020 then the false positive rate rises to 90.5%, but this is being rather cheeky. I am hoping folk are beginning to realise just how easy it is for authorities to hide the truth when then know what they are doing.

So where does this leave us? Well, it leaves me with an estimate of laboratory specificity that I can trust. Now that I have this I can adjust various data series to remove expected numbers of false positives, thence to investigate medical specificity. The idea here is a bit convoluted but it boils down to determining the apparent specificity that our bodies are reacting to so we may estimate how many laboratory-assigned true positives are being treated as though they were false positives i.e. the aim is to distinguish test results that are medically meaningless.

Recent work using ARIMA/TCM suggests medical specificity could be down at 90.0%, which would give rise to a false positive reporting rate of 99.2%, and which may be compared with the 86.9% laboratory reference rate. This yields a surplus of 12.3% of cases that, despite being labelled positive, have no relevant clinical meaning - please note this is a new idea and I'm still chewing it over, but hopefully folk will be able to see where I'm trying to go with this.

The problem arises because we count cases but don't bother to record whether they have clinical relevance in terms of infection or health status. Between 19<sup>th</sup> March 2020 and 30<sup>th</sup> June 2021 viral testing detected 4,208,171 cases within the population and 112,847 COVID positive admissions to hospital. Though we can calculate an overall admission rate of 2.68% it is astonishing, to say the least, that we have no idea which of those 4,208,171 cases became the 112,847 cases being admitted and whether the reason for their admission was, in fact, COVID related. Neither do we know if those 112,847 were discharged after routine diagnostics and procedures for non-COVID conditions or whether they became serious COVID cases. Our lack of basic knowledge is breathtaking.

**22<sup>nd</sup> July 2021**

### ***Potential Bias In Case Rate Estimation***

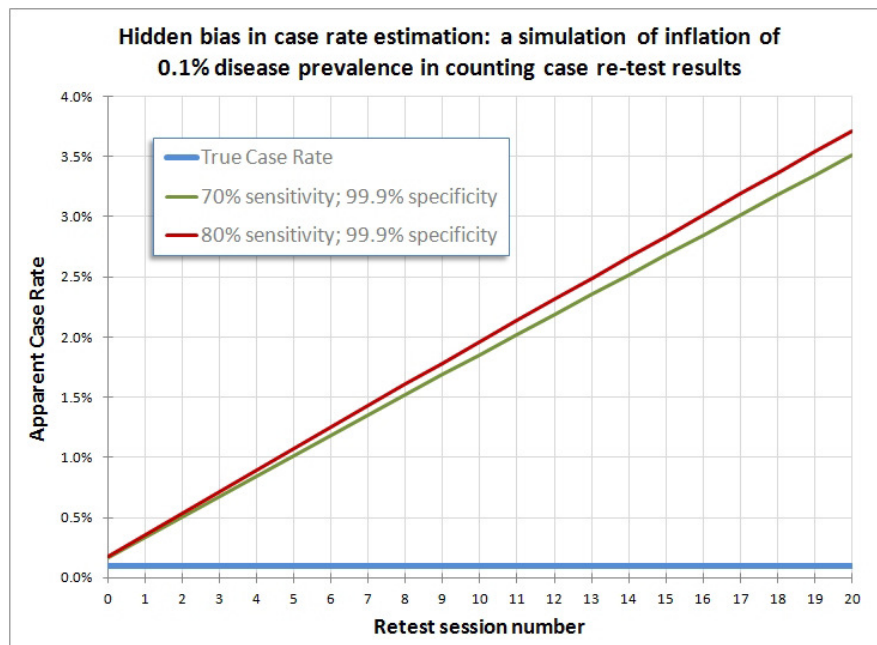
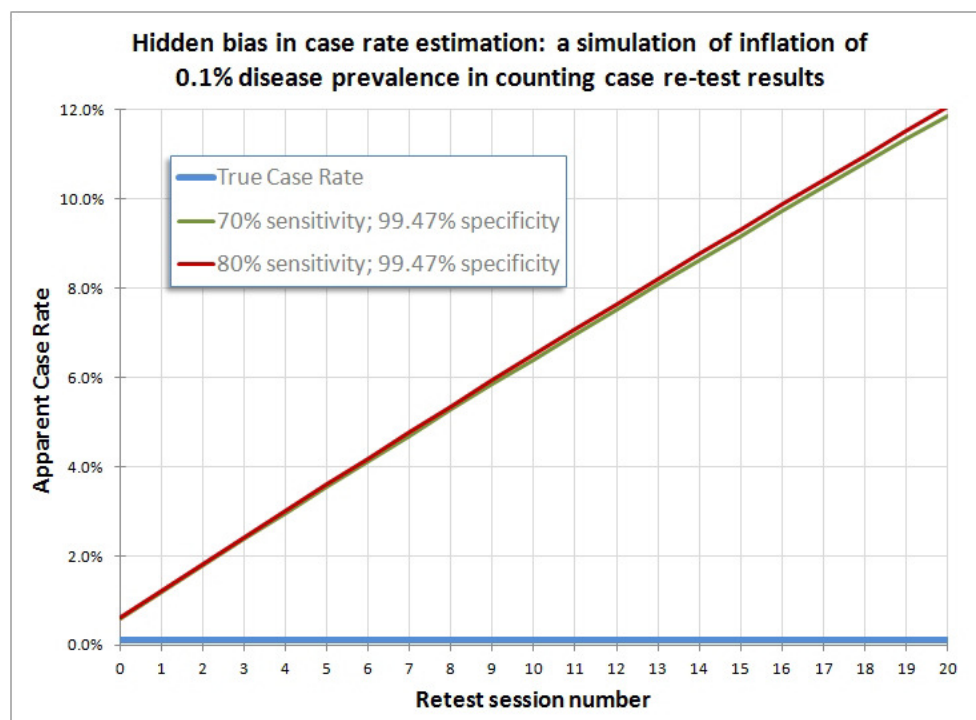
Let us suppose that 1,000 people go for a test at a time when the pre-test probability (disease prevalence) is 10%. Let us also suppose the PCR test is performing to nominal standards with a sensitivity of 80% and specificity of 99.9%. Simple calculation reveals that we may expect 80 true positive cases ( $1,000 \times 10\% \times 80\%$ ), 1 false positive case ( $1,000 \times 90\% \times 0.1\%$ ), 899 true negative cases ( $1,000 \times 90\% \times 99.9\%$ ) and 20 false negative cases ( $1,000 \times 10\% \times 20\%$ ), making a total of 81 apparent positive cases. Our estimate of the case rate will be  $81 / 1,000 = 8.1\%$ , being a slight underestimate of the true rate of 10% arising from a less than perfect test performance.

Let us now suppose the 81 positive cases went into self isolation whilst the remaining 919 went back to work/school to be tested a second time – what then? Well, my spreadsheet reveals we may expect 74 true positives, 1 false positive, 826 true negatives and 18 false negatives, making a total of 75 apparent positives. Our estimate of the case rate will now depend on how we handle the results of the first and second round of testing on the same group of people.

If we are being honest the case rate estimate will be  $81 + 75 / 1,000 + 919 = 8.13\%$  i.e. we are counting both rounds of results from both rounds of tests. If we are being dishonest the estimate will be  $81 + 75 / 1,000 = 15.60\%$  i.e. we are counting just the positive test results extracted from the same group of people who have been subject to retest. Thus, if we don't count the right things we don't get the right answer! The true denominator when estimating case rates over time must always be the unit of the person-test and not simply the number of people i.e. it is their product that gives rise to cases. We may think of this product as COVID detection chances: 10 people having 3 tests each provide 30 detection chances and not just 10 chances!

To get a feel for how this bias would pan out over a series of 20 retests I attach two slides, the first being calculated on the basis of a nominal test specificity of 99.9%, the second on the basis of my 99.47% estimate of specificity as derived in my previous post entitled Medical vs Laboratory Test Specificity. If anybody thinks 20 retests is ridiculous try having a chat with anybody in education!

We see that by not adding up the right numbers we can generate some rather inflated estimates of disease prevalence using nothing more than retest data in a shoddy manner. Hopefully you can now see why I've been ranting on about TRB (test rate bias) and making adjustments for this in my analyses.



23<sup>rd</sup> July 2021

### ***Know Your Rate!***

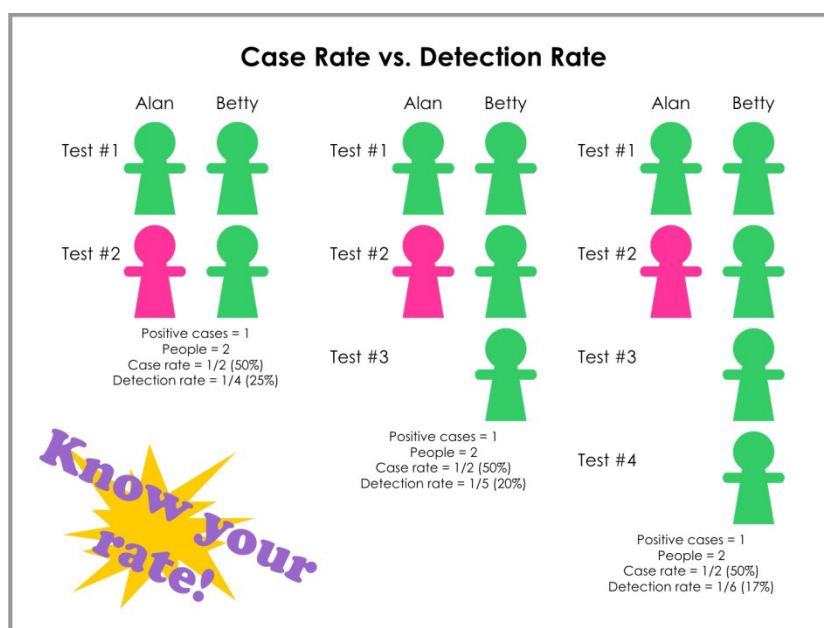
I've been wondering if there's a simple way of expressing some of my recent ranting and came up with this idea. Whilst it is pretty obvious that the more people we test the more likely we are to find positive cases, what is not so obvious is the same situation applies to re-testing of the same people. The more people re-test themselves the more likely they are to obtain a positive result at some point. This is because the test, whether PCR or LFD, isn't 100% perfect and will produce both false negatives and false positives as well as true negative and true positive results.



This all boils down to probability theory and the fact that if we roll a die enough times we are going to get that six. We can get twelve people to each roll that die once or we can get six people to roll it twice, four people to roll it three times, three people to roll it four times, two people to roll it six times or one person to roll it twelve times. In each instance we are giving ourselves 12 chances of obtaining a six, and if our die is fair and true then we would expect two sixes to appear.

In the attached slide I've got Alan and Betty experiencing three different scenarios, with Alan testing positive on his second test. Since there are only two people involved the case rate is always  $1/2 = 50\%$  but the detection rate declines as we offer Betty more test opportunities. The tricky issue is deciding which of these two rates offers the more accurate estimate of disease prevalence. If testing was 100% reliable then we could simply assume Alan has the virus but Betty has not and go for 50%; since testing is not 100% reliable then we have to take into account increasing risk of false results as more and more tests are undertaken. The detection rate may thus become a better proxy for disease prevalence under certain circumstances.

We may attempt to solve the puzzle by testing a random sample of the population once and once only. In the final example on the right hand side six different people would be given one test and we'd see how these results compare with the re-testing of Alan and Betty.



24<sup>th</sup> July 2021

### ***Iterated False Positive Adjustment***

Adjustment of data to account for false positive reporting has been a feature of my posts for a while now but this is only half the story: we also have to adjust for false negative reporting! False positives come to the fore in the end stages of a pandemic when true positives will be rare if not completely absent within the population. In contrast false negatives come to the fore in the heat of a pandemic when infected cases are not detected because of an imperfect test.

This morning I decided to fry up a simple simulation whereby I established 21 samples of 10,000 people tested with cases running from 1 to 100, giving me prevalence rates of 0.01% - 1.00%. Test sensitivity and specificity were set at the nominal 80% and 99.9% for which both false negative and false positive counts calculated. These counts were then used to adjust the initial case count and prevalence was re-calculated using the adjusted case count. This process was iterated five times, producing five incrementally adjusted estimates of disease prevalence for my set of 21 samples.

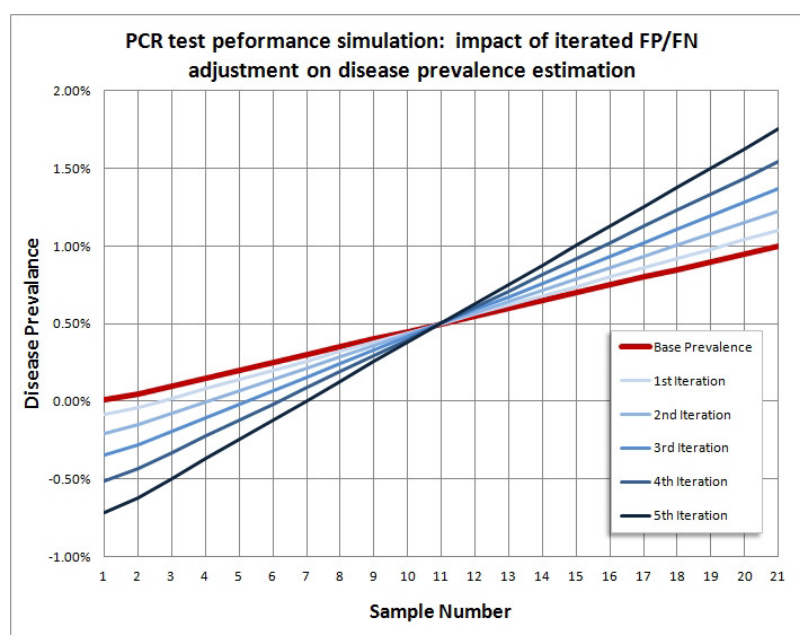
The results are attached and tell an interesting story. The original unadjusted series is represented by the thick red line, which runs from 0.01% for sample #1 through to 1.00% for sample #21. As iterations proceed you can see the lines tilting about a point represented by sample #11, this presenting a prevalence of 0.50% that remained unchanged throughout. Above this value re-iterated false negative adjustment will blow the sample up until disease prevalence reaches 100%, below this value re-iterated false positive adjustment will clobber the sample until disease prevalence reaches 0%.

We may ask what is so special about 0.50% prevalence that makes it invariant. The answer is that there is nothing special about 0.50% per se but it does approximate a critical threshold that arises from the algebraic interplay between test sensitivity and test specificity, the formula for which is:

$$\text{Critical Prevalence} = 1 - \text{specificity} / 2 - \text{specificity} - \text{sensitivity}$$

Iterated adjustment for false positive or false negative beyond this precise tipping point will result in estimates of 0% or 100%, this being the numerical equivalent of hitting the buffers.

I appreciate this is one of those long-winded geeky posts that mangles brains but it's one that has got me re-thinking my entire approach to data adjustment. In a nutshell I no longer see any point in adjustment aside from adjustment for test rate bias, which is a different matter entirely. This would not be the case if some sort of sensible convergence for testing was reached, but the maths says we logically end with 0% or 100% prevalence depending on which side of the critical threshold our initial estimate starts out at. I shall now quietly munch on biscuits in deep contemplation of all my wild and pointless thrashing.



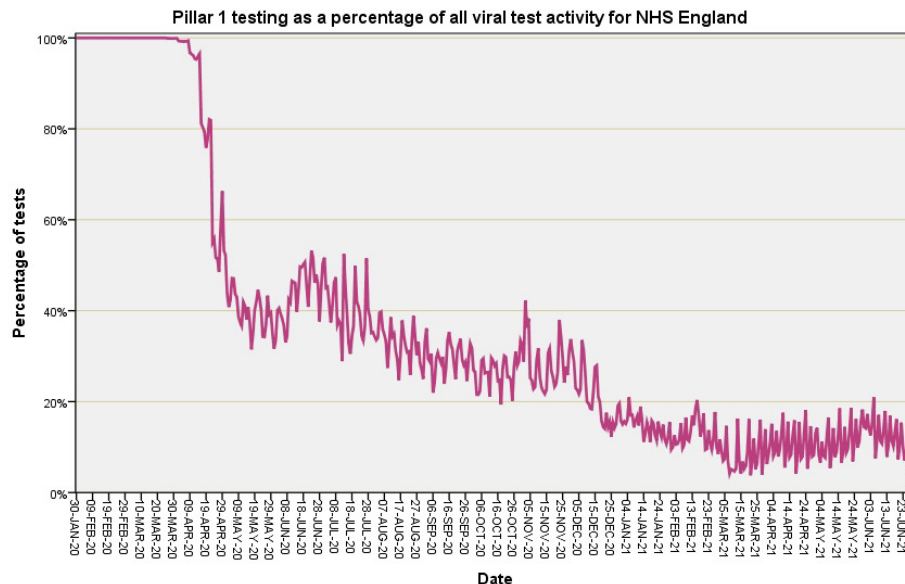
25<sup>th</sup> July 2021

## Clinical Test Bias

Sometimes walking away from the daily grind of crunching numbers enables you to see a bigger picture. This last couple of days I've been going all theoretical again, preferring to use pencil, paper and a hand-held calculator. This gave me insight into the relationship between test specificity and sensitivity and how these determine a critical threshold for disease prevalence above which iterated adjustment to account for test imperfection blows-up into 100% pandemic, and below which the pandemic disappears down a dynamic drain into a false positive abyss. With this approach in mind I sat staring at rows and rows of tests and cases until another idea struck me – clinical test bias.

We've been skirting around this subject for a while, yet not quantified it! Clinical test bias arises from the initial testing of cases in hospital at the beginning of the pandemic under the pillar 1 scheme, with broadening of testing into the wider community under the pillar 2 scheme. It doesn't take much nous to realise that estimates of disease prevalence for cases already in hospital will be higher than those obtained from swabbing a bunch of asymptomatic and rather healthy school kids. What we may not have fully realised is the disease can be made to magically disappear or re-appear within the population depending on how we balance pillar 1 and 2 testing.

With this in mind I coined the phrase 'Clinical Test Bias' (CTB) and whipped-up this slide of pillar 1 tests as a percentage of all viral tests. That there snaky purple line can be used as a weighting factor in statistical analyses to account for the varying emphasis between pillar 1 and pillar 2 testing. Quite why it has taken me this long to realise as something as fundamental as this must remain a mystery! My instructions for tyrants are simple: do more pillar 1 testing to scare folk into submission; do more pillar 2 testing as proof of vaccine efficacy; balance pillar 1 and 2 testing if you want to learn something.



Source: <https://coronavirus.data.gov.uk/>

## ***Bias Adjusted Disease Prevalence By Pillar***

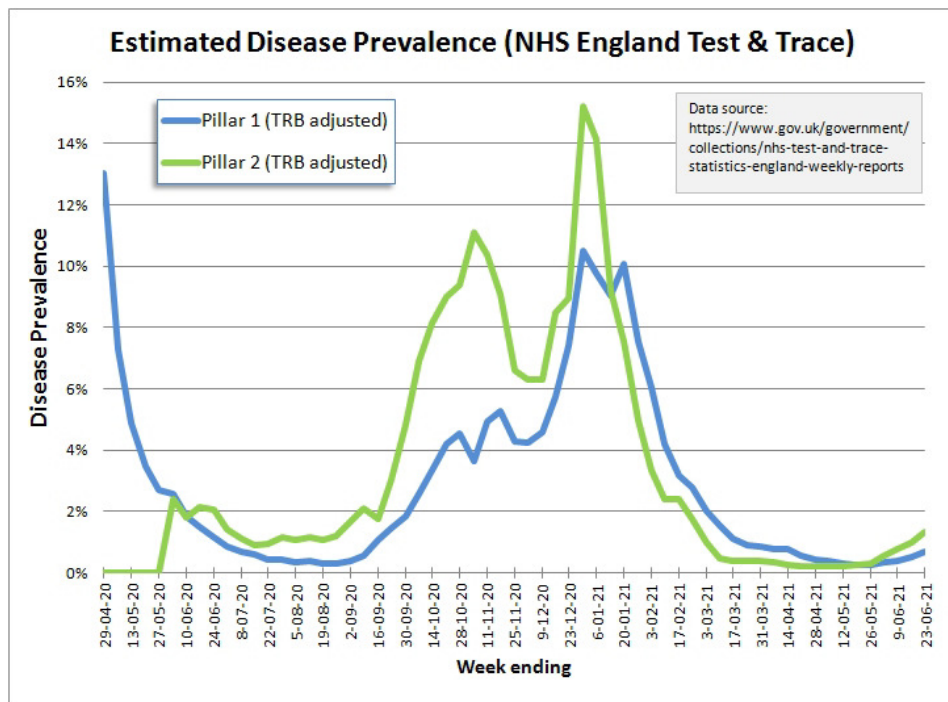
With Clinical Test Bias (CTB) and Test Rate Bias (TRB) concepts in my toolbox I hung a right and went straight down the NHS England Test & Trace weekly data avenue. What we have here are weekly estimates of disease prevalence (positive cases per 100 people tested) by pillar that have been adjusted for test rate bias (TRB).

TRB adjustment sounds fancy but all it boils down to is factoring the estimates to ensure a standardised rate of one test per person per week across time. If folk are tested two or even three times a week during certain intense periods then we are going to detect more cases during these periods compared to periods when they're only getting one test per week or less. An analogy would be narrowing the goalmouth when the opposition comes to take penalties and widening it when it's your turn to take penalties (a tip I shall pass to Gareth Southgate).

So here we are, a slide of TRB adjusted disease prevalence by pillar (please note I'm not fiddling with false positive adjustment at this stage). There are some curious features starting with COVID going bonkers in the wider community back in October 2020 (pillar 2) in comparison to clinical settings (pillar 1). Either the virus became shy of going to hospital or the zillion LFD tests we handed out to school kids were doing something wacky (or both if we consider mutation to weaker strains). Perhaps the Coca-Cola trick was discovered earlier than we think.

The festive peak remained primarily a community affair, though we do see a more sensible trajectory for clinical and community infection with clinical leading the way from Jan 2021. Between w/e 10/6/20 and 20/1/21 we observe a greater density of disease in the community than we do in our hospitals that are meant to be treating the disease! I am sure there is a sensible explanation hiding in the corridors of power somewhere.

N.B. 'The wider community' doesn't mean a random sample from the general population but a small subset of self-selecting or specially selected folk. Divide these numbers by at least 10 to get prevalence proper.



26<sup>th</sup> July 2021

## Being Genuine About Specificity

For a while now I have been concerned with nailing a decent estimate of test specificity because on this hangs a great deal. A low test specificity of, say, 95% together with a nominal test sensitivity of 90% and disease prevalence of 0.1% (a.k.a. pre-test probability; 0.1% equates to 1 in 1,000 being infected) would mean a whopping great 98% of positive test results would be false positives. In contrast, a 99.9% specificity would reduce the level of false positive reporting to a rather concerning 53%, whereas a 99.99% specificity would reduce false positive reporting to just 10%. You can now see why the authorities want to convince folk that the PCR test has serious specificity.

Several folk have claimed I'm misleading the public by suggesting test specificity may not be as high as claimed by official sources. The more informed of these point to the UK COVID-19 infection survey and weighty official statements such as this...

### 7. Test sensitivity and specificity

*The estimates provided in Sections 2 to 6 are for the percentage of the private-residential population testing positive for the coronavirus (COVID-19), otherwise known as the positivity rate. We do not report the prevalence rate. To calculate the prevalence rate, we would need an accurate understanding of the swab test's sensitivity (true-positive rate) and specificity (true-negative rate).*

*While we do not know the true sensitivity and specificity of the test, our data and related studies provide an indication of what these are likely to be. In particular, the data suggest that the false-positive rate is very low -- under 0.005%. We do not know the sensitivity of the swab test. However, other studies suggest that sensitivity (the rate of true-positive test results) may be somewhere between 85% and 98%.*

*You can find more information on sensitivity and specificity in our methods article and our recent blog. You can find more information on the data suggesting that our test's false-positive rate is very low in a paper written by academic partners at the University of Oxford.*

...I can well imagine that numerate types reading this are going to assume I'm talking out of my bottom and generally being a very bad person, but let us just check matters.

Assuming 100% (perfect) test sensitivity and a disease prevalence of 0.1% then to reach a false positive rate as low as 0.005% test specificity must be at least 99.999995%, which is utterly ludicrous. I thus unearthed the (unpublished and yet to be peer-reviewed) paper by Walker et al (2021) at the source of this claim (link below). We may note Walker et al avoided typing the ridiculous estimate for specificity out in full, shortening it to a seemingly >99.995%. H'mmm. Here's the paragraph where they explain how they arrived at this figure...

*However, every diagnostic test has false-positives, here defining a false-positive as detection of virus by RT-PCR when no virus is present in a sample, so some of our single gene "lower", or even "moderate", evidence positives are inevitably false. However, the false-positive rate (as defined) would generally be expected to be approximately constant over time, since it is either random or driven by external factors, although cross-contamination (which should be minimised by good laboratory practice) may theoretically be related to background prevalence/viral load. Variation in the*

*percentage of all tests accounted for by “lower” evidence positives, and in particular the proportionate increases in “lower” evidence positives as “higher” evidence positives increased during September 2020 supports more genuinely lower-level infections occurring during the summer, and an overall false-positive rate for this test of below ~0.005% i.e. at least 99.995% specificity.*

...there are some weird statements in this starting with the false positive rate (FPR) “expected to be approximately constant over time”. This is gibberish since the false positive rate is calculated as  $FPR = \text{false positives} / \text{true positives} + \text{false positives}$ . Anybody in their right mind will realise the number of true positives will depend on test sensitivity and, of course, disease prevalence - which varies over time. Therefore FPR \*cannot\* be invariant and must also vary with disease prevalence (please see earlier posts). The sensible part is admission of a random element, but I have run out of face to palm!

Their last sentence is petty confusing but what Walker et al are trying to say is that they looked at a tiny data window in September when testing was plentiful yet positive case detection utterly minimal, and concluded that if all of these were false positives then specificity must be up at 99.995% at the very least. As it so happens I did this same analysis back in a post on 19th July entitled Take Your Pick where I expose the game for what it is.

Incidentally, my latest (good boy) estimate for test specificity is 99.47% with a Wald confidence interval of 99.46%; 99.49% - details may be found in my post of 19th July entitled Medical vs Laboratory Test Specificity.

Now the interesting twist in the lemon here is that 100% test sensitivity, 0.1% pre-test probability and 99.995% test specificity yield an FPR of 5% and not 0.005% - did Walker et al put the decimal point in the wrong place? Did they subtract 99.995% specificity from 100% to arrive at 0.005% and then erroneously assume this gave them the false positive reporting rate? We may also note to get these figures to work we've had to assume a perfect test sensitivity of 100% yet Walker et al in the same paper quote 85% - 98%. Are we looking at a pre-print whoopsy or something rather whiffy in Oxford's kitchen cupboard? My conclusion is that somebody is misleading the public but it probably isn't me!

<https://www.medrxiv.org/content/10.1101/2020.10.25.20219048v2.full.pdf>

**30<sup>th</sup> July 2021**

### ***PHE Claim: 22 million infections & 60,000 deaths prevented (intro)***

PHE estimates that 60,000 deaths and 22,057,000 infections have been prevented as a result of the COVID-19 vaccination programme, up to 23 July. This is based on modelling analysis from PHE and Cambridge University's MRC Biostatistics Unit. The estimated number of deaths prevented has increased significantly since the most recent estimates were published, with the estimated number of infections prevented doubling in just 2 weeks. It was previously estimated that up to 9 July, around 37,000 deaths and 11,000,000 infections were prevented. The methods used to estimate deaths and infections prevented is based on direct and indirect effects of the vaccination programme.

Back in April 2021 a similar claim was made in which 10,400 deaths were estimated to have been prevented and I posted some rather sharp words about this (please see the collated posts PDF on the group Google drive – link in Read Me First pinned post).

I reminded folk back then that these figures arise from what we call a scenario, that is to say a number of assumptions are made and a hypothetical number of deaths are derived. This isn't the same as conducting a clinical trial and counting real people: these are 22 million hypothetical infections and 60,000 hypothetical deaths.

What can now do is use an empirical approach to check whether these hypothetical savings reflect real life or are simply a fantasy arising from poor assumption and circular reasoning, as was the case back in April 2021.

We can pull down daily data for new cases, disease prevalence (cases per 100 people tested), positive admissions to hospital, inpatients testing positive, percentage of general beds taken by COVID positive patients, percentage of mechanical ventilation (MV) beds taken by COVID positive patients, 28-day COVID positive deaths and certified COVID deaths. Appropriate analysis of these eight real world time series will tell a powerful truth – all we need to add is daily data for accumulated 1st and 2nd doses and look for a robust relationship over time.

If the vaccine is having a direct, positive effect as claimed then we would expect to see an inverse relationship such that each of the eight outcome measures are declining in number and rate as dosing of the population rises. We'll obviously need to allow for build up of immunity, for which the ONS have adopted 3 weeks delay between dosing and benefit, and so I shall do the same.

The tricky issue here is to choose an appropriate method and in this instance the appropriate method is Temporal Causal Modelling (TCM), being a powerful tool for analysing time dependent data using the concept of Granger causality (please refer to Wiki).

Though the technical aspect behind this statistical tool is complex the concept is simple: if progression of vaccine dosing is producing real world benefits then dosing will arise as a statistically significant predictor of one or more outcome measures.

In plain English this means we'll see a link between doses issued and cases, beds and deaths over time. I shall now put PHE's mighty claim to the litmus test using the period 8th Dec 2020 – 30th June 2021 with no idea as to what I'll find – watch this space!

<https://www.gov.uk/government/news/covid-19-vaccine-surveillance-report-published>

### ***PHE Claim: 22 million infections & 60,000 deaths prevented (TCM)***

In my previous post I outlined PHE's claim and explained that these figures do not represent counts of real savings in a real world but are estimates derived from numerical modelling that relies on a number of assumptions. They are thus hypothetical savings that would accrue if the assumptions held true. What PHE/MRC Cambridge have failed to do is double-check that their hypothetical savings mirror what we may observe in the real world.

I elected to use eight clinical outcomes to assess this for NHS England, these being: new cases, disease prevalence (cases per 100 people tested), positive admissions to hospital, inpatients testing positive, percentage of general beds taken by COVID positive patients, percentage of mechanical ventilation (MV) beds taken by COVID positive patients, 28-day COVID positive deaths and certified COVID deaths.

Since this is time dependent data I elected to use Temporal Causal Modelling (TCM) to assess matters, permitting a 3 week delay for building of immunity post-vaccination and adopting a study period of 8th Dec 2020 – 30th Jun 2021. Although the statistical technique applied is complex, the principle is quite simple; namely, increasing accumulated daily dose should be translating into decreasing cases, admissions and deaths over time once we account for delays. One way to think of this is time-based correlation.

Attached is a summary table of several TCM runs revealing the probability values (p-values) attained by the three independent variable series (received 1st dose only; received 1st & 2nd doses; total doses issued) in the prediction of each of the eight clinical outcomes. Lack of a statistically significant value at the 95% level of confidence ( $p < 0.05$ ) means there is no correlation between dosing and outcome over time.

We observe just two statistically significant relationships among a total of 24, this fact alone revealing the vaccination programme is having no impact in the real world over and above that expected by chance alone. Those hypothetical savings claimed by PHE/MRC Cambridge are thus exactly that – hypothetical.

Whilst the time-based correlation between MV bed use by positive cases and accumulated 1st dose is very highly significant ( $p < 0.001$ ) we may ask why this isn't reflected in any other clinical indicator. Examination of the coefficient table reveals the effect is very small, amounting to an estimated decline in 0.044% MV bed use per million initial doses – a 1% reduction in MV bed use would thus require 2.27 billion initial doses! This curious correlation crops up again in relation to accumulated 1st and 2nd doses ( $p = 0.022$ ). This time the coefficient is positive, amounting to an estimated increase in 0.026% MV bed use per million final doses – a 1% increase in MV bed use would thus require 3.85 billion second doses! We may conclude that this is a statistically significant result with no real world meaning.

Wiki tells us...

' "Computer says no" is a catchphrase first used in the British sketch comedy television programme Little Britain in 2004. In British culture, the phrase is used to criticise public-facing organisations and customer service staff who rely on information stored on or generated by a computer to make decisions and respond to customers' requests, often in a manner which goes against common sense'

...not only does the computer say no but temporal causal modelling of real world data also says no. I suggest PHE/MRC Cambridge change their blend of tea.



## Temporal Causal Modelling of Primary Outcome Measures with Accumulated Daily Dose as Independent

### Summary of p-values

| Daily Outcome Measure                                                             | Accumulated Vaccination Status (England) |                          |                    |
|-----------------------------------------------------------------------------------|------------------------------------------|--------------------------|--------------------|
|                                                                                   | Received 1st Dose Only                   | Received 1st & 2nd Doses | Total Doses Issued |
| new cases                                                                         | 0.063                                    | 0.880                    | 0.246              |
| disease prevalence                                                                | 0.311                                    | 0.167                    | 0.216              |
| positive admissions to hospital                                                   | 0.202                                    | 0.852                    | 0.539              |
| inpatients testing positive                                                       | 0.466                                    | 0.856                    | 0.766              |
| Percentage of general beds taken by positive patients                             | 0.338                                    | 0.075                    | 0.610              |
| Percentage of MV beds taken by positive patients                                  | <0.001                                   | 0.022                    | 0.524              |
| 28-day positive deaths                                                            | 0.558                                    | 0.696                    | 0.899              |
| Certified COVID deaths                                                            | 0.381                                    | 0.733                    | 0.760              |
| Data period: 8th Dec 2020 - 30th Jun 2021                                         |                                          |                          |                    |
| Data source: NHS England, UK GOV coronavirus dashboard                            |                                          |                          |                    |
| NOTE: a 3 week lag was introduced to permit building of immunity following dosing |                                          |                          |                    |

### ***PHE Claim: 22 million infections & 60,000 deaths prevented (TCM II)***

In my previous post on this topic we saw clear evidence that the vaccine rollout programme in the real world isn't translating into a decline in cases, admission and deaths above that expected from the natural rise and fall of such. The data period I had chosen was 8<sup>th</sup> Dec 2020 – 30<sup>th</sup> Jun 2021 but since it takes a while for immunity to build I had elected to introduce a 3 week delay for the dose data. For my second temporal causal modelling (TCM) run I elected to use the period 29<sup>th</sup> Dec 2020 – 30<sup>th</sup> Jun 2021 to see how things looked as the clinical situation matured.

The summary results are presented once again in the same tabular format but this time we see that little wrinkle with the percentage of MV bed use by COVID positive cases has disappeared, suggesting this was mere artefact as I had concluded. We may note total lack of a statistically significant result in the prediction of seven clinical outcomes using the 3-week delayed accumulated vaccination series. Once again we may conclude the vaccination rollout programme - according to real world data and not some hypothetical construct by PHE/MRC Cambridge - is doing absolutely nothing in alleviating the situation.

I did think I had nailed the first real world result in support of vaccination benefit with highly statistically significant p-values in the prediction of new daily COVID cases after the initial dose alone ( $p < 0.001$ ), second dose ( $p < 0.001$ ), and according to total doses given ( $p < 0.001$ ). There's only one rather big fly in the ointment here and that is the coefficient series for each model run sums to a positive value, which is why these cells are shaded pink for danger.

In plain English this means accumulated vaccine doses over the period 29<sup>th</sup> Dec 2020 – 30<sup>th</sup> Jun 2021 are associated with an increase in daily new cases, with an estimated +152 extra daily cases per million initial doses and +272 extra daily cases per million second doses. This would suggest that, once we level the numerical playing field, vaccine dosing is leading to more confirmed cases but not more admissions, beds or deaths. This would make sense if vaccine components or our physiological response to these components are triggering the PCR test.

This is not necessarily a large effect given the overall mean daily new cases for this period stands at 11,428 cases per day – we're looking at an overall increase of 1.3% - 2.4% - though percentage increases due to vaccination contamination would be ten times this with the daily case rate down at 1,143 cases per day. This begs the question of whether the vaccine is triggering test results. Computer says possibly!

## Temporal Causal Modelling of Primary Outcome Measures with Accumulated Daily Dose as Independent

### Summary of p-values

| Daily Outcome Measure                                 | Accumulated Vaccination Status (England) |                          |                    |
|-------------------------------------------------------|------------------------------------------|--------------------------|--------------------|
|                                                       | Received 1st Dose Only                   | Received 1st & 2nd Doses | Total Doses Issued |
| new cases                                             | <0.001                                   | <0.001                   | <0.001             |
| disease prevalence                                    | 0.730                                    | 0.299                    | 0.560              |
| positive admissions to hospital                       | 0.761                                    | 0.995                    | 0.903              |
| inpatients testing positive                           | 0.886                                    | 1.000                    | 0.971              |
| Percentage of general beds taken by positive patients | 0.105                                    | 0.874                    | 0.762              |
| Percentage of MV beds taken by positive patients      | 0.199                                    | 0.984                    | 0.528              |
| 28-day positive deaths                                | 0.529                                    | 0.999                    | 0.963              |
| Certified COVID deaths                                | 0.190                                    | 0.998                    | 0.835              |

Data period: 29th Dec 2020 - 30th Jun 2021

Data source: NHS England, UK GOV coronavirus dashboard

NOTE: a 3 week lag was introduced to permit building of immunity following dosing

31<sup>st</sup> July 2021

### Administrative Noise in Daily Data

'Administrative noise' is a fancy way of describing the hiccup introduced by weekends, which may be administrative (processing of forms ceases along with data collection/entry), clinical (elective intake ceases at weekends, swab-taking slackens), managerial (staffing levels are lower) or behavioural (people have better things to do).

Despite test laboratories working to capacity pretty much 24/7 the daily data series newCasesBySpecimenDate reveals this weekly hiccup when we subject it to spectral analysis (please refer to Wiki for an explanation of spectral analysis).

In the attached periodogram for newCasesBySpecimenDate we get to see the data broken down in a way that will be unfamiliar to most people apart from those involved in sound recording, signal processing and audio engineering.

When it comes to music we all have an intuitive grasp of pitch and frequency since our auditory apparatus can discriminate between the low grunt of a double bass and the squeal of a violin. If we put one of these instruments through a spectrum analyser in a studio we'd get to see the sound broken down into a plot of intensity against frequency such that if a pianist hit middle 'C' on a keyboard we'd see a peak of sound energy at 262Hz.

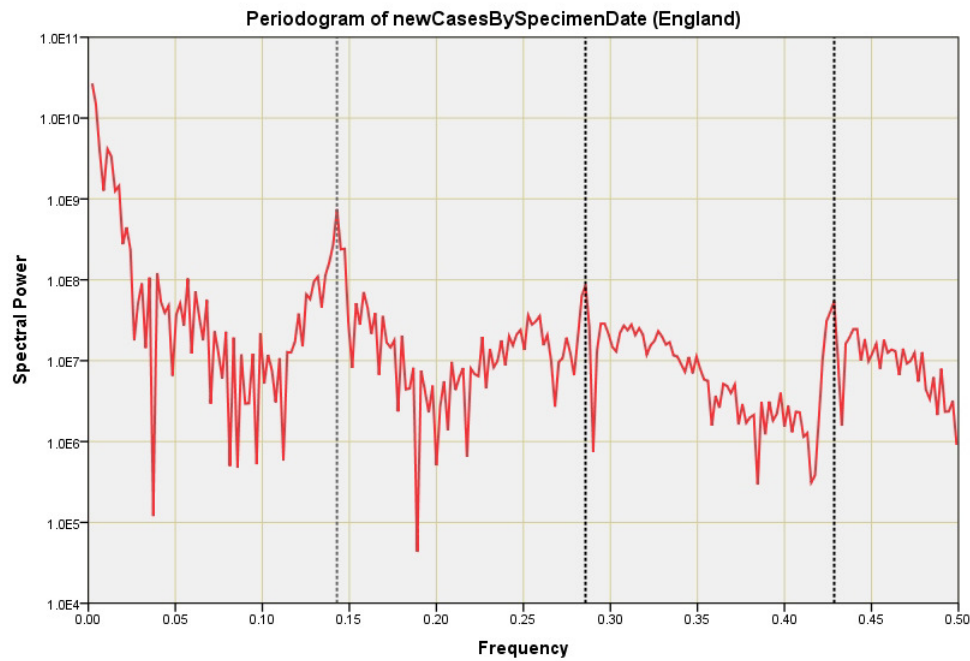
This same principle of breaking a sound recording down into constituent frequency components also applies to data collected regularly in time. Wacko as it may seem we could convert COVID daily case counts into an electrical signal analogue and play the information back through an amp! Obviously the frequencies would be incredibly low but they'd be frequencies nevertheless: the attached slide reveals how low they'd go.

I have marked three peaks in the periodogram for newCasesBySpecimenDate corresponding to frequency values of 0.143, 0.286 and 0.429, which correspond to time periods of 7 days, 14 days and 21 days (n.b.  $1/7 = 0.143$ ). Thus, we see that there is a strong 7-day harmonic peak within the data series that also resonates at 14 days and 21 days.

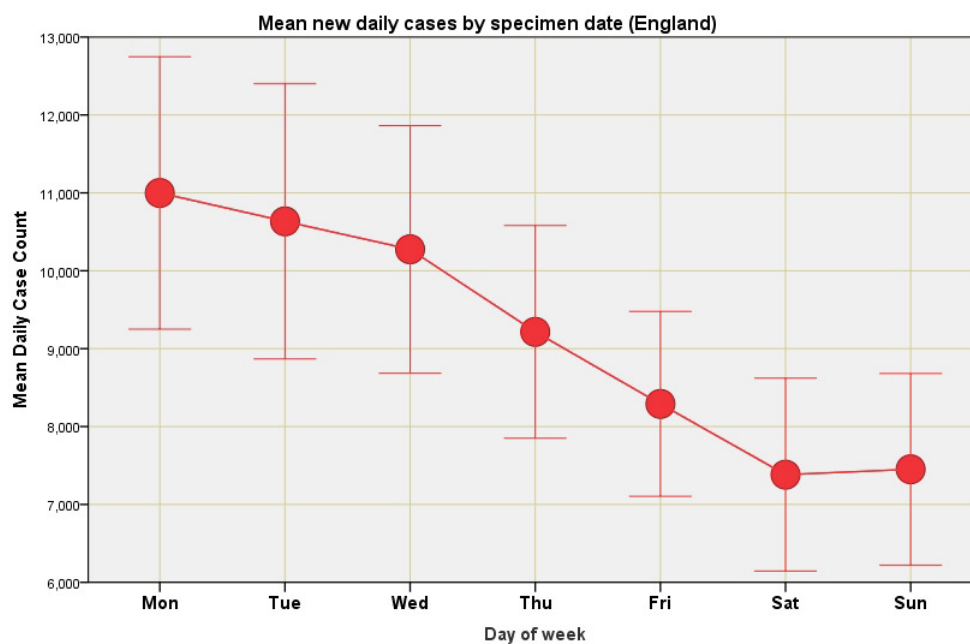
What does all this mean? Well it means that, despite the promise of 24/7 testing, there is a strong weekly pattern to case processing that is going to influence any and all time-dependent analyses.

We can see this pattern quite clearly in the second slide where I've derived mean daily counts by day of week for the period 3rd Apr 2020 – 30th Jun 2021. We see that fewer specimens are taken and processed over the weekend as we may expect, with a concerted effort to catch up made every Monday morning.

This regular wrinkle is why you'll see the Office for National Statistics (ONS) using rolling 7-day counts to minimise administrative noise in certain analyses, and I shall be doing the same in my next round of TCM modelling – watch this space!



Data source: UK GOV coronavirus dashboard; Data Period: 3rd Apr 2020 - 30th Jun 2021



Data Source: UK GOV coronavirus dashboard; Data period: 3/4/20 - 30/6/21. Means with +/- 1 standard error

### ***PHE Claim: 22 million infections & 60,000 deaths prevented (7-day Rolling)***

In my posts of 30<sup>th</sup> July I confirmed lack of time-dependent predictive relationships between accumulative vaccine dosing and several primary clinical outcomes, this being indicative of ineffective vaccination products despite PHE's largely hypothetical claim. We saw clear evidence of a positive relationship between dosing and rising cases and postulated that vaccination may be triggering positive tests. In order to clarify this somewhat critical situation I decided to minimise administrative noise within the time series data by calculating rolling 7-day totals and rates – a technique used by the Office for National Statistics (ONS).

Previously I had chosen the time period 29<sup>th</sup> Dec 2020 – 30<sup>th</sup> Jun 2021 for study but had noted in other supporting analyses that disease prevalence peaked on 4<sup>th</sup> Jan 2021. In order to avoid the potentially confounding factor of a rising then falling background prevalence I thus

elected to narrow the study period to 4<sup>th</sup> Jan – 30<sup>th</sup> Jun and analyse the so-called ‘third wave’ in decline. This slightly later period would also give vaccines a better chance of revealing accrued benefits within the population as a whole.

The idea behind my study is fairly simple. We know that infections, cases, admissions, bed use and death come and go in waves and that many factors other than vaccination will be responsible for this ebb and flow. The big question is whether the rollout programme has served to curtail the recent wave over and above that expected from such natural ebb and flow. We may deduce that it has if the time series for accumulated doses can be shown to be a strong predictor of that ebb and flow; particularly so if it can be shown to be a strong Granger causal predictor (please refer to Wiki).

In the table below I once again present a summary of p-values obtained from 16 TCM model runs. Pink shaded cells are statistically significant relationships where vaccination rollout is associated with a disbenefit and green shaded cells are statistically significant relationships where vaccination rollout is associated with a benefit. Non-shaded cells are relationships that failed to reach statistical significance at the 95% level of confidence ( $p > 0.05$ ).

As we may plainly see 14 of the 16 relationships tested fail to reach statistical significance. This once again confirms earlier findings that there are no significant benefits to vaccination accruing at the population level once appropriate analyses are made using empirical data and empirical data alone. PHE/MRC Cambridge may well hypothesise that 22 million infections and 60,000 deaths have been saved through conjecture but this conjecture isn’t supported by temporal causal modelling of observed data.

Two pink shaded cells pop up for accumulated second dosing of the nation revealing a possible vaccine disbenefit. With regard to the relationship between second dose and rolling 7-day new case counts, TCM estimates an increase of +120.14 cases per rolling week per million additional second doses ( $p = 0.021$ ). There is a similar, smaller effect for rolling 7-day disease prevalence (positive cases per 100 people tested) with an estimated rise of +0.004% per million additional doses – we may view these results as related.

So where does this leave us? Well, after many hours of data preparation and analysis I can pretty much safely conclude that there is no real world evidence in support of PHE’s bold claim. Folk may ask why eminent and rather knowledgeable figures like Jonathan Van Tam, our Deputy Chief Medical Officer, stand behind dubious outputs produced by PHE. I can furnish the answer from personal experience of working at these levels within the UK government: they have no choice to do otherwise.

## Temporal Causal Modelling of Primary Outcome Measures with Accumulated Daily Dose as Independent

### Summary of p-values

| Outcome Measure (rolling 7-day)                                                   | Accumulated Vaccination Status (England) |                          |
|-----------------------------------------------------------------------------------|------------------------------------------|--------------------------|
|                                                                                   | Received 1st Dose Only                   | Received 1st & 2nd Doses |
| new cases                                                                         | 0.388                                    | 0.021                    |
| disease prevalence                                                                | 0.146                                    | 0.036                    |
| positive admissions to hospital                                                   | 0.953                                    | 0.981                    |
| inpatients testing positive                                                       | 0.996                                    | 0.988                    |
| Percentage of general beds taken by positive patients                             | 0.183                                    | 1.000                    |
| Percentage of MV beds taken by positive patients                                  | 0.987                                    | 0.998                    |
| 28-day positive deaths                                                            | 0.842                                    | 0.994                    |
| Certified COVID deaths                                                            | 0.742                                    | 0.985                    |
| Data period: 4th Jan 2020 - 30th Jun 2021                                         |                                          |                          |
| Data source: NHS England, UK GOV coronavirus dashboard                            |                                          |                          |
| NOTE: a 3 week lag was introduced to permit building of immunity following dosing |                                          |                          |

# John Dee, His Almanac

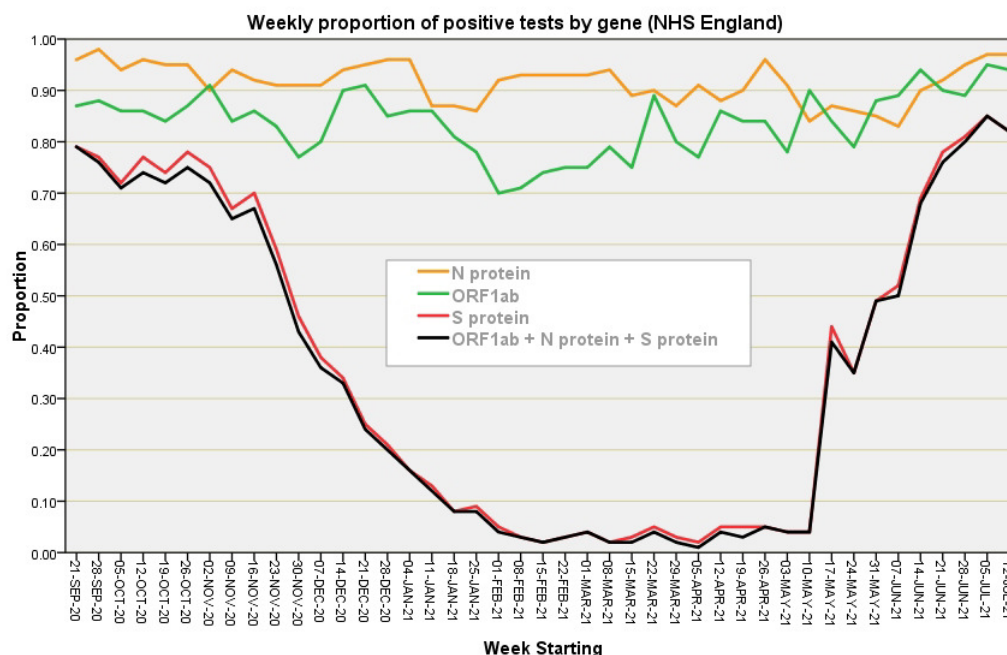
1<sup>st</sup> August

## COVID-19 Infection Survey

The COVID-19 infection survey tracks case positivity and symptoms for a self-selected sample of volunteers with the overall aim of understanding how many people of different ages across the UK have already had COVID-19. The study is undertaken by the Office of National Statistics (ONS) and is sponsored by Oxford University. Participation is managed by IQVIA, and the Glasgow Lighthouse Laboratory processes and stores nose and throat swab samples. Analysis of data is undertaken by both ONS and Oxford University, with certain files being made available to the public via the UK GOV web portal (see link below).

One of our group experts – Sparky von Lexis- recently threw me a file stuffed down in the technical section of the online documentation that usefully reveals the weekly time series for PCR cycle thresholds along with weekly detection rates for gene presence. The infection survey, through PCR, tracks three SARS-COV-2 gene components (N protein, S protein, ORF1ab) but, as Sparky has pointed out in threads below, use of these in case identification is somewhat nefarious since logic would dictate all three must be simultaneously detected to constitute a case claim, yet authorities settle for matching just one of the three. To my way of thinking that's like holding a fingernail up and claiming you've captured an orangutan. The attached slide reveals the weekly proportion of COVID-19 positive cases by gene pattern from w/b 21st Sep 2020. The interesting thing for me is the relative constancy of the ORF1ab + N genes over this period.

<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/coronaviruscovid19infectionsurvey/pilot/23april2021>



Source: COVID-19 National Infection Survey

## COVID-19 Infection Survey (Ct Series)

In my previous post I introduced the national infection survey being carried out by ONS and Oxford University and mentioned a time series for weekly cycle thresholds (Ct) used to identify viral gene components. Well here is that very series!

ONS provide the mean weekly threshold value used by the Glasgow Lighthouse Laboratory along with 10th, 25th, 50th, 75th and 90th percentile values. In case people are not familiar with these statistical terms the mean is also known as the average and the percentiles are



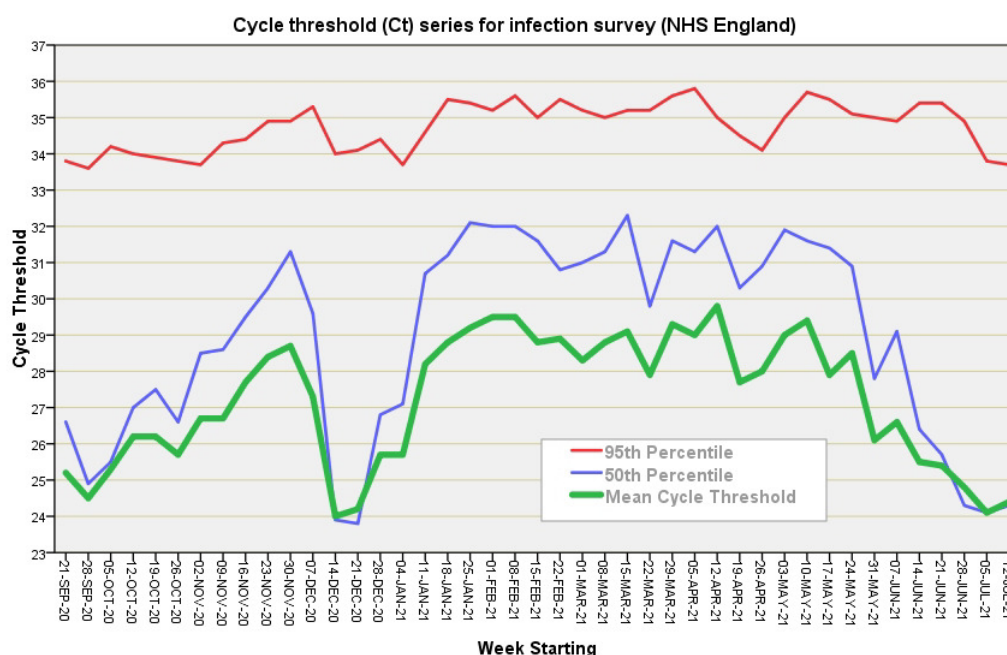
simply the cycle threshold values under which that percentage of data lies e.g. a 50th percentile Ct value of 28.00 would mean 50% of the swab samples processed that week would have been run at Ct values of 28 and below.

Being a well-keen sort of bod I'm very much into presenting the 95th and 99th percentiles along with minimum and maximum values so we may get a feel for the edges of the data but ONS don't seem to be as keen for some reason. What I've done, therefore, is gone all Bayesian and modelled the missing 95th percentile on a bootstrap week-by-week basis so we get a flavour of the top end of testing.

The first thing that caught my eye is just how much week-to-week variation there is in the mean cycle threshold. The name of the game is to batch run to a fixed maximum threshold but note the CT value at which individual swab samples 'pop'. Lower mean values would be indicative of greater viral loads within the swab sample. Whilst this makes sense of the December dip in mean Ct we then have to fathom why there's no sign of the January 2021 peak, and why viral load has been increasing over the summer months at a time when cases, admissions and deaths are at rock bottom (I will examine this paradox in detail in a future post).

The overall series mean fetched up at 27.23 cycles with a standard deviation of 1.79 cycles and 95% confidence interval of 26.67; 27.78 (n=43). The minimum mean weekly recorded value was 24.00 cycles, with a maximum of 29.80 cycles. We may consider that the theoretical level of PCR test amplification available at 24.00 cycles amounts to a sizeable x16,777,216 whereas this rises to a thumping great x934,746,550 at 29.80 cycles. Thus we see that the variation we observe in mean weekly threshold value gives rise to a factor difference of x55.7 in terms of amplification. What doesn't smell right is that I'd expect the viral loading factor to go through the roof and not hang about a sedate x55.7

We may note that a weekly mean bobbing about 28 implies that a significant number of swab samples must have been processed at thresholds beyond the MIQE guidelines (Minimum Information for Publication of Quantitative Real-Time PCR Experiments), this being borne out by the 50<sup>th</sup> percentile series running along at 30 – 32 cycles for a substantial proportion of time, which means half the samples were cooked at cycles beyond 30 – 32. The 95th percentile series running along at 34 – 36 cycles gives a feel to where the cap is, and I suspect the batch maximum is set to 40 cycles.



Source: COVID-19 National Infection Survey

## COVID-19 Infection Survey (Ct correlates)

In my previous post entitled COVID-19 Infection Survey (Ct Series) I brought up the issue of lower mean weekly cycle thresholds indicating higher viral loading. We saw a dip during December 2020 that made sense but we also saw a dip from May 2021 onward that didn't make sense and I promised to consider the matter in more detail.

What I've done is taken the ONS weekly infection survey data for England and bolt on weekly counts of new cases, positive admissions, inpatients testing positive, proportion of COVID designated general beds, proportion of COVID designated mechanical ventilation (MV) beds, certified COVID deaths and 28-day COVID positive deaths as outcome indicators. If the infection survey is generating sensible results that are considered indicative of the general population then we should see strongly negative correlations between mean cycle threshold and outcomes such as these.



Attached is a tabulation of Pearson bivariate correlations between mean weekly cycle threshold and seven clinical indicators. Only one statistically significant correlation arises and that is between the weekly count for new COVID cases and mean cycle threshold ( $r = -0.432$ ,  $p=0.005$ ,  $n=40$ ). This is the sort of result I was expecting and suggests that the infection survey is doing a decent job of assessing national infection status. The elephant in the room, however, is that infection status (as detected by PCR) isn't translating into hospitalisation, severity of symptom or death. I must conclude that we're good at detecting something that isn't having an impact.

There are those that will grumble about delays making this meaningless and so I extended the analysis using ARIMA time series techniques to ensure I haven't fallen foul of this trap. ARIMA revealed mean weekly cycle threshold to be a statistically significant predictor of weekly new case counts (stationary R-square = 0.344,  $p=0.002$ ), whereas it failed to reach significance at the 95% level of confidence ( $p>0.05$ ) in the prediction of the remaining six outcome variables.

| Pearson Bivariate Correlations                          |                     |                      |
|---------------------------------------------------------|---------------------|----------------------|
|                                                         |                     | Mean Cycle Threshold |
| New weekly COVID Cases                                  | Pearson Correlation | -0.435               |
|                                                         | Sig. (2-tailed)     | 0.005                |
|                                                         | N                   | 40                   |
| Weekly COVID admissions to hospital                     | Pearson Correlation | 0.031                |
|                                                         | Sig. (2-tailed)     | 0.851                |
|                                                         | N                   | 40                   |
| Weekly inpatients testing positive                      | Pearson Correlation | -0.137               |
|                                                         | Sig. (2-tailed)     | 0.398                |
|                                                         | N                   | 40                   |
| Fraction of beds occupied by COVID                      | Pearson Correlation | 0.121                |
|                                                         | Sig. (2-tailed)     | 0.451                |
|                                                         | N                   | 41                   |
| Fraction of MV beds occupied by COVID                   | Pearson Correlation | 0.219                |
|                                                         | Sig. (2-tailed)     | 0.168                |
|                                                         | N                   | 41                   |
| Certified COVID Deaths                                  | Pearson Correlation | 0.096                |
|                                                         | Sig. (2-tailed)     | 0.556                |
|                                                         | N                   | 40                   |
| 28-day COVID positive deaths                            | Pearson Correlation | 0.065                |
|                                                         | Sig. (2-tailed)     | 0.691                |
|                                                         | N                   | 40                   |
| Correlation is significant at the 0.01 level (2-tailed) |                     |                      |

### COVID-19 Infection Survey (Consistency)

The problem with the pandemic is that it never stays still. We have outbursts of original strains, followed by declines, followed by periods of low infection, followed by outbursts of mutations ad infinitum. What I've done with the weekly datafile is to slice it into four periods (Sep 2020 – Nov 2021; Dec 2020 – Jan 2021; Feb – Apr 2021; May – Jul 2021) to represent four different dynamics (please refer to the slide in my post entitled COVID-19 Infection Survey). Within each of these phases I would argue that we should see some consistency between gene expression and mean cycle threshold. What I mean by this is that we should expect to see strong positive correlations between N, S and ORF1ab components within a pandemic phase and we should also expect to see strong negative correlations with mean cycle threshold indicating higher viral loads during outbreaks. This is not exactly what we see and I offer a Pearson bivariate correlation matrix for consideration.

In the case of rising infection for the second 'wave' over the period Sep – Nov 2020 only one gene component offers a statistically significant relationship with mean cycle threshold and that is the N gene ( $r = -0.750$ ,  $p=0.020$ ,  $n=9$ ). We may ask why the ORF1ab and S components failed to feature in viral loading. Another issue to consider is lack of any statistically significant correlation between all three components at a time when viral levels would have been building. I appreciate the sample size is small ( $n=9$ ) but would have expected some vague sign of agreement, as witnessed by significant correlations that may be found in other phases.

We may now consider correlations for the phase covering the great third 'wave' (Dec 2020 – Jan 2021). Both the N and ORF1ab components express themselves as they should, both exhibiting statistically significant negative correlations with mean cycle threshold, indicating high viral loading. The curious thing here is lack of a significant correlation between mean cycle threshold and the S component ( $p=0.975$ ), which means independence between levels of spike protein and viral loading for positive swab cases; I find this most bizarre!

The quiet phase of Feb – Apr 2021 offers a total lack of correlation between component expression and viral loading as we may expect – a sensible result at last!

The most consistent set of correlations by far may be found in the final phase (May – Jul 2021) when mutations took hold of the nation. All three components yield statistically significant negative correlations with mean cycle threshold, meaning their presence in swab samples corresponds with higher viral loading, as may be expected. We also see a strongly positive correlation between N and S components ( $r = 0.837$ ,

p=0.002, n=10) that aligns with expectation. The remaining non-significant correlations show promise given the small sample size and I suspect a few more weeks' worth of data will likely push these into significance.

So what does all this mean in plain English? It means there is a worrying inconsistency in test results, whereby three genes from the same virus are not showing up as they should over time. Aside from the most recent period of May – Jul 2021 even the infamous S protein 'spike' isn't playing a straight bat and it's worth asking why.

| Pearson Bivariate Correlations                          |                      |                     |           |        |           |
|---------------------------------------------------------|----------------------|---------------------|-----------|--------|-----------|
| Pandemic phase                                          |                      |                     | N protein | ORF1ab | S protein |
| Sep - Nov 20                                            | Mean Cycle Threshold | Pearson Correlation | -0.750    | -0.153 | -0.609    |
|                                                         |                      | Sig. (2-tailed)     | 0.020     | 0.694  | 0.082     |
|                                                         |                      | N                   | 9         | 9      | 9         |
|                                                         | N protein            | Pearson Correlation |           | -0.330 | 0.461     |
|                                                         |                      | Sig. (2-tailed)     |           | 0.385  | 0.212     |
|                                                         |                      | N                   |           | 9      | 9         |
|                                                         | ORF1ab               | Pearson Correlation |           |        | 0.475     |
|                                                         |                      | Sig. (2-tailed)     |           |        | 0.196     |
|                                                         |                      | N                   |           |        | 9         |
| Dec 20 - Jan 21                                         | Mean Cycle Threshold | Pearson Correlation | -0.837    | -0.858 | -0.012    |
|                                                         |                      | Sig. (2-tailed)     | 0.003     | 0.002  | 0.975     |
|                                                         |                      | N                   | 10        | 10     | 10        |
|                                                         | N protein            | Pearson Correlation |           | 0.590  | 0.258     |
|                                                         |                      | Sig. (2-tailed)     |           | 0.073  | 0.471     |
|                                                         |                      | N                   |           | 10     | 10        |
|                                                         | ORF1ab               | Pearson Correlation |           |        | -0.099    |
|                                                         |                      | Sig. (2-tailed)     |           |        | 0.785     |
|                                                         |                      | N                   |           |        | 10        |
| Feb - Apr 21                                            | Mean Cycle Threshold | Pearson Correlation | -0.315    | -0.485 | -0.293    |
|                                                         |                      | Sig. (2-tailed)     | 0.272     | 0.079  | 0.310     |
|                                                         |                      | N                   | 14        | 14     | 14        |
|                                                         | N protein            | Pearson Correlation |           | -0.297 | -0.124    |
|                                                         |                      | Sig. (2-tailed)     |           | 0.302  | 0.672     |
|                                                         |                      | N                   |           | 14     | 14        |
|                                                         | ORF1ab               | Pearson Correlation |           |        | 0.489     |
|                                                         |                      | Sig. (2-tailed)     |           |        | 0.076     |
|                                                         |                      | N                   |           |        | 14        |
| May - July 21                                           | Mean Cycle Threshold | Pearson Correlation | -0.818    | -0.686 | -0.961    |
|                                                         |                      | Sig. (2-tailed)     | 0.004     | 0.029  | 0.000     |
|                                                         |                      | N                   | 10        | 10     | 10        |
|                                                         | N protein            | Pearson Correlation |           | 0.567  | 0.837     |
|                                                         |                      | Sig. (2-tailed)     |           | 0.087  | 0.002     |
|                                                         |                      | N                   |           | 10     | 10        |
|                                                         | ORF1ab               | Pearson Correlation |           |        | 0.536     |
|                                                         |                      | Sig. (2-tailed)     |           |        | 0.110     |
|                                                         |                      | N                   |           |        | 10        |
| Correlation is significant at the 0.01 level (2-tailed) |                      |                     |           |        |           |
| Correlation is significant at the 0.05 level (2-tailed) |                      |                     |           |        |           |

## COVID-19 Infection Survey (outcome correlates)

In my previous post entitled COVID-19 Infection Survey (Ct/gene) we took a look at the relationship between gene components and mean cycle threshold and found a great deal that did not make sense. Two assay combinations didn't offer up a relationship with mean cycle threshold and a further three offered up statistically significant positive relationships such that the greater the proportion of the gene the less the SARS-COV-2 viral loading!

Whilst waiting for expert bods to explain this surreal result I decided to see if the quantified presence of gene components or their assay combinations bore any relationship with seven real world outcomes, these being: weekly counts of new cases, weekly positive admissions, weekly inpatients testing positive, weekly proportion of COVID designated general beds, weekly proportion of COVID designated mechanical ventilation (MV) beds, weekly certified COVID deaths and weekly 28-day COVID positive deaths. Again, I started out nice and simple with a matrix of Pearson bivariate correlations.

Of a total of 49 correlations only 4 made it to statistical significance and these are shaded light (p<0.05) and dark (p<0.01) pink, and concern themselves with the fraction of mechanical ventilation (MV) beds used by COVID cases. This seems like a robust real world result until you realise two of these correlations are positive (N protein; ORF1ab + N protein) and two negative (S protein; ORF1ab + N protein + S protein). Again, I find myself scratching my head!

If we tried to extract any logic from this it would be that presence of the N protein in the presence or absence of ORF1ab might be linked to disease severity and that's about it. Paradoxically, presence of the S protein (which previously made sense in terms of its negative relationship to mean cycle threshold) appears to be inversely related to disease severity. This may start to make sense if I go roll myself a magic cigarette.

All thoughts welcome! Meanwhile, I'll run this through time series modelling to check whether some weird time delay effect isn't throwing the results.

UPDATE: I decided to use Temporal Causal Modelling (TCM) to get to the heart of the matter only to discover only one combinatorial gene assay offered itself as a statistically significant causal predictor of a real world outcome, this being ORF1ab + N protein in the prediction of the weekly count of inpatients testing positive ( $F = 2.68$ ,  $df1=4$ ,  $df2=30$ ,  $p=0.050$ ). This is hardly surprising because it's effectively a mirror of the infection survey!

|                                                          |                     | Pearson Bivariate Correlations |        |           |                       |                       |                          |                                      |
|----------------------------------------------------------|---------------------|--------------------------------|--------|-----------|-----------------------|-----------------------|--------------------------|--------------------------------------|
|                                                          |                     | N protein                      | ORF1ab | S protein | ORF1ab +<br>N protein | ORF1ab +<br>S protein | N protein +<br>S protein | ORF1ab + N<br>protein + S<br>protein |
| New COVID Cases                                          | Pearson Correlation | -0.224                         | -0.298 | 0.107     | -0.027                | 0.013                 | 0.114                    | 0.106                                |
|                                                          | Sig. (2-tailed)     | 0.165                          | 0.062  | 0.509     | 0.867                 | 0.938                 | 0.485                    | 0.514                                |
|                                                          | N                   | 40                             | 40     | 40        | 40                    | 40                    | 40                       | 40                                   |
| COVID admissions                                         | Pearson Correlation | 0.168                          | -0.003 | -0.240    | 0.245                 | -0.218                | 0.024                    | -0.241                               |
|                                                          | Sig. (2-tailed)     | 0.301                          | 0.987  | 0.136     | 0.128                 | 0.176                 | 0.885                    | 0.134                                |
|                                                          | N                   | 40                             | 40     | 40        | 40                    | 40                    | 40                       | 40                                   |
| COVID inpatients                                         | Pearson Correlation | 0.025                          | -0.154 | -0.076    | 0.108                 | -0.114                | 0.139                    | -0.079                               |
|                                                          | Sig. (2-tailed)     | 0.879                          | 0.342  | 0.641     | 0.507                 | 0.484                 | 0.392                    | 0.628                                |
|                                                          | N                   | 40                             | 40     | 40        | 40                    | 40                    | 40                       | 40                                   |
| Fraction of beds<br>occupied by COVID                    | Pearson Correlation | 0.280                          | -0.018 | -0.282    | 0.273                 | -0.196                | 0.069                    | -0.285                               |
|                                                          | Sig. (2-tailed)     | 0.076                          | 0.912  | 0.074     | 0.084                 | 0.220                 | 0.667                    | 0.071                                |
|                                                          | N                   | 41                             | 41     | 41        | 41                    | 41                    | 41                       | 41                                   |
| Fraction of MV beds<br>occupied by COVID                 | Pearson Correlation | 0.425                          | -0.066 | -0.340    | 0.314                 | -0.231                | 0.041                    | -0.343                               |
|                                                          | Sig. (2-tailed)     | 0.006                          | 0.684  | 0.030     | 0.046                 | 0.146                 | 0.801                    | 0.028                                |
|                                                          | N                   | 41                             | 41     | 41        | 41                    | 41                    | 41                       | 41                                   |
| Daily Certified Deaths                                   | Pearson Correlation | 0.221                          | 0.025  | -0.241    | 0.230                 | -0.218                | 0.071                    | -0.244                               |
|                                                          | Sig. (2-tailed)     | 0.171                          | 0.879  | 0.133     | 0.153                 | 0.176                 | 0.665                    | 0.130                                |
|                                                          | N                   | 40                             | 40     | 40        | 40                    | 40                    | 40                       | 40                                   |
| Daily 28-day Deaths                                      | Pearson Correlation | 0.177                          | 0.019  | -0.203    | 0.196                 | -0.195                | 0.092                    | -0.206                               |
|                                                          | Sig. (2-tailed)     | 0.274                          | 0.909  | 0.208     | 0.225                 | 0.227                 | 0.573                    | 0.203                                |
|                                                          | N                   | 40                             | 40     | 40        | 40                    | 40                    | 40                       | 40                                   |
| Correlation is significant at the 0.01 level (2-tailed). |                     |                                |        |           |                       |                       |                          |                                      |
| Correlation is significant at the 0.05 level (2-tailed). |                     |                                |        |           |                       |                       |                          |                                      |

5<sup>th</sup> August 2021

## EudraVigilance Monthly Update

Since 31st July I have been attempting to undertake my regular monthly analysis of adverse reactions logged within the European database for suspected adverse drug reactions for the four primary COVID biological products licensed for emergency (Moderna, Pfizer, AstraZeneca and J&J biological products). This has been particularly tricky this month owing to the database being down or preventing data retrieval for various inexplicable reasons.

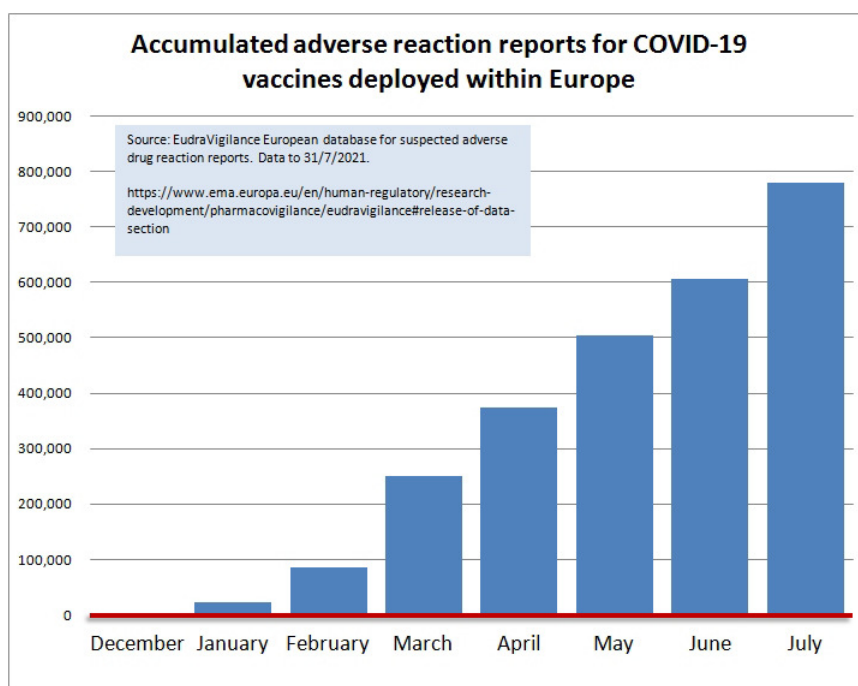
As you study these figures it is worth noting that they are by no means comprehensive, with audits suggesting 1% - 10% data capture at best. I have received several personal communications indicating vaccinated folk are reluctant to acknowledge symptoms let alone report them, and there is concern amongst colleagues that the medical profession are dragging their feet. Both of these behaviours endanger the very alarm system put in place to ensure public safety.

As at 31st July 2021 EudraVigilance reports 20,595 deaths among 779,048 individuals who have reported adverse reactions post-vaccination. Accumulated monthly counts continue to rise at a near linear rate estimated at 118,886 reports per month ( $p<0.001$ ; 95% confidence interval = 107,109; 130,663).

The European Centre for Disease Control (ECDC) reports 254,449,306 vaccinated individuals for the same period, thus returning an adverse incident report rate of 0.310% (779,048/254,449,306) and a fatal report rate of 0.008% (20,595/254,449,306) for all four biological products. A total of 1,960,153 adverse reactions were suffered by the 779,048 individuals concerned, indicating an average of 2.52 post-vaccination events

per case. Of these 968,416 (49.4%) were categorised as serious, with 991,737 (50.6%) categorised as non-serious. Breakdowns for these top line figures may be found in the attached charts.

| As at 31st July | Total Adverse Reports | Total deaths | Adverse report fatality rate | People receiving vaccine | Post-vaccination adverse report rate | Post-vaccination death rate |
|-----------------|-----------------------|--------------|------------------------------|--------------------------|--------------------------------------|-----------------------------|
| Moderna         | 84,587                | 5,460        | 6.5%                         | 26,524,485               | 0.319%                               | 0.021%                      |
| Pfizer          | 327,665               | 9,868        | 3.0%                         | 176,739,161              | 0.185%                               | 0.006%                      |
| AstraZeneca     | 346,881               | 4,534        | 1.3%                         | 41,469,788               | 0.836%                               | 0.011%                      |
| Janssen         | 19,915                | 733          | 3.7%                         | 9,715,873                | 0.205%                               | 0.008%                      |
| Total           | 779,048               | 20,595       | 2.6%                         | 254,449,306              | 0.310%                               | 0.008%                      |





### Fatal Reactions Following COVID-19 Vaccination by Product

| As at 31st July                   | Accumulated Raw Counts |        |             |         | Total  |
|-----------------------------------|------------------------|--------|-------------|---------|--------|
|                                   | Moderna                | Pfizer | AstraZeneca | Janssen |        |
| Blood & lymphatic system          | 49                     | 126    | 184         | 23      | 382    |
| Cardiac                           | 599                    | 1,489  | 523         | 92      | 2,703  |
| Congenital                        | 3                      | 14     | 3           | 0       | 20     |
| Ear & labyrinth                   | 0                      | 8      | 0           | 0       | 8      |
| Endocrine                         | 1                      | 3      | 3           | 1       | 8      |
| Eye                               | 13                     | 21     | 18          | 3       | 55     |
| Gastrointestinal                  | 200                    | 431    | 229         | 27      | 887    |
| General & administration site     | 2,188                  | 2,832  | 1,128       | 177     | 6,325  |
| Hepatobiliary                     | 20                     | 46     | 41          | 7       | 114    |
| Immune system                     | 9                      | 53     | 18          | 5       | 85     |
| Infections & infestations         | 332                    | 941    | 284         | 21      | 1,578  |
| Injury, poisoning & complication  | 102                    | 146    | 119         | 11      | 378    |
| Medical Investigations            | 103                    | 323    | 105         | 51      | 582    |
| Metabolism & nutritional          | 125                    | 178    | 62          | 12      | 377    |
| Musculoskeletal                   | 107                    | 122    | 63          | 18      | 310    |
| Neoplasms                         | 27                     | 43     | 13          | 2       | 85     |
| Nervous system                    | 552                    | 1,081  | 727         | 90      | 2,450  |
| Pregnancy, puerperium & perinatal | 5                      | 24     | 8           | 1       | 38     |
| Product issues                    | 0                      | 1      | 1           | 0       | 2      |
| Psychiatric                       | 90                     | 130    | 39          | 8       | 267    |
| Renal & urinary                   | 85                     | 157    | 40          | 9       | 291    |
| Reproductive & breast             | 2                      | 2      | 0           | 2       | 6      |
| Respiratory & thoracic            | 521                    | 1,168  | 534         | 57      | 2,280  |
| Skin & subcutaneous tissue        | 45                     | 87     | 30          | 2       | 164    |
| Social circumstances              | 20                     | 13     | 7           | 3       | 43     |
| Surgical & medical procedures     | 55                     | 25     | 19          | 30      | 129    |
| Vascular                          | 207                    | 404    | 336         | 81      | 1,028  |
| Total                             | 5,460                  | 9,868  | 4,534       | 733     | 20,595 |

Source: EudraVigilance European database for suspected adverse drug reaction reports

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

### Serious Reactions Following COVID-19 Vaccination by Product

| As at 31st July                   | Accumulated Raw Counts |         |             |         | Total   |
|-----------------------------------|------------------------|---------|-------------|---------|---------|
|                                   | Moderna                | Pfizer  | AstraZeneca | Janssen |         |
| Blood & lymphatic system          | 1,814                  | 7,464   | 7,276       | 343     | 16,897  |
| Cardiac                           | 5,379                  | 14,453  | 9,851       | 640     | 30,323  |
| Congenital                        | 0                      | 0       | 0           | 21      | 21      |
| Ear & labyrinth                   | 2,057                  | 5,320   | 7,049       | 173     | 14,599  |
| Endocrine                         | 151                    | 388     | 326         | 18      | 883     |
| Eye                               | 2,693                  | 7,145   | 10,674      | 406     | 20,918  |
| Gastrointestinal                  | 9,133                  | 27,844  | 51,967      | 1,126   | 90,070  |
| General & administration site     | 22,486                 | 65,280  | 114,378     | 3,172   | 205,316 |
| Hepatobiliary                     | 332                    | 683     | 640         | 73      | 1,728   |
| Immune system                     | 1,573                  | 7,342   | 2,965       | 203     | 12,083  |
| Infections & infestations         | 5,003                  | 16,045  | 14,407      | 656     | 36,111  |
| Injury, poisoning & complication  | 3,952                  | 7,489   | 5,998       | 402     | 17,841  |
| Medical Investigations            | 2,411                  | 11,452  | 10,000      | 1,836   | 25,699  |
| Metabolism & nutritional          | 1,744                  | 3,838   | 7,693       | 193     | 13,468  |
| Musculoskeletal                   | 9,557                  | 30,960  | 62,480      | 1,623   | 104,620 |
| Neoplasms                         | 245                    | 490     | 344         | 23      | 1,102   |
| Nervous system                    | 21,143                 | 56,500  | 104,620     | 3,059   | 185,322 |
| Pregnancy, puerperium & perinatal | 425                    | 685     | 309         | 16      | 1,435   |
| Product issues                    | 0                      | 0       | 0           | 0       | 0       |
| Psychiatric                       | 3,562                  | 8,445   | 12,187      | 398     | 24,592  |
| Renal & urinary                   | 1,191                  | 1,910   | 2,268       | 163     | 5,532   |
| Reproductive & breast             | 1,072                  | 5,516   | 6,115       | 121     | 12,824  |
| Respiratory & thoracic            | 7,738                  | 22,698  | 22,116      | 1,230   | 53,782  |
| Skin & subcutaneous tissue        | 6,563                  | 18,595  | 26,636      | 591     | 52,385  |
| Social circumstances              | 885                    | 1,091   | 715         | 122     | 2,813   |
| Surgical & medical procedures     | 671                    | 361     | 727         | 466     | 2,225   |
| Vascular                          | 4,959                  | 14,490  | 14,743      | 1,635   | 35,827  |
| Total                             | 116,739                | 336,484 | 496,484     | 18,709  | 968,416 |
| Serious to non-serious ratio      | 1.22                   | 0.78    | 1.16        | 0.49    | 0.98    |

Source: EudraVigilance European database for suspected adverse drug reaction reports

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

### Non Serious Reactions Following COVID-19 Vaccination by Product

| As at 31st July                   | Accumulated Raw Counts |         |             |         |         |
|-----------------------------------|------------------------|---------|-------------|---------|---------|
|                                   | Moderna                | Pfizer  | AstraZeneca | Janssen | Total   |
| Blood & lymphatic system          | 2,087                  | 13,540  | 3,636       | 188     | 19,451  |
| Cardiac                           | 760                    | 5,264   | 5,280       | 227     | 11,531  |
| Congenital                        | 5                      | 22      | 21          | 0       | 48      |
| Ear & labyrinth                   | 642                    | 4,593   | 3,594       | 173     | 9,002   |
| Endocrine                         | 14                     | 83      | 89          | 6       | 192     |
| Eye                               | 637                    | 4,548   | 5,434       | 299     | 10,918  |
| Gastrointestinal                  | 9,429                  | 41,768  | 39,945      | 4,323   | 95,465  |
| General & administration site     | 34,827                 | 139,934 | 130,109     | 11,925  | 316,795 |
| Hepatobiliary                     | 13                     | 96      | 89          | 5       | 203     |
| Immune system                     | 230                    | 1,063   | 698         | 28      | 2,019   |
| Infections & infestations         | 1,148                  | 8,069   | 7,670       | 259     | 17,146  |
| Injury, poisoning & complication  | 700                    | 1,825   | 4,116       | 127     | 6,768   |
| Medical Investigations            | 1,878                  | 7,718   | 10,068      | 1,100   | 20,764  |
| Metabolism & nutritional          | 361                    | 1,837   | 3,394       | 112     | 5,704   |
| Musculoskeletal                   | 17,186                 | 74,055  | 78,506      | 7,991   | 177,738 |
| Neoplasms                         | 7                      | 38      | 102         | 1       | 148     |
| Nervous system                    | 16,975                 | 81,131  | 89,412      | 9,181   | 196,699 |
| Pregnancy, puerperium & perinatal | 7                      | 34      | 54          | 1       | 96      |
| Product issues                    | 17                     | 70      | 37          | 7       | 131     |
| Psychiatric                       | 662                    | 5,214   | 5,109       | 261     | 11,246  |
| Renal & urinary                   | 115                    | 571     | 1,056       | 44      | 1,786   |
| Reproductive & breast             | 454                    | 2,512   | 5,254       | 233     | 8,453   |
| Respiratory & thoracic            | 1,639                  | 10,944  | 9,864       | 648     | 23,095  |
| Skin & subcutaneous tissue        | 4,737                  | 18,375  | 15,801      | 1,011   | 39,924  |
| Social circumstances              | 40                     | 198     | 378         | 21      | 637     |
| Surgical & medical procedures     | 29                     | 203     | 244         | 2       | 478     |
| Vascular                          | 1,026                  | 6,911   | 7,096       | 267     | 15,300  |
| Total                             | 95,625                 | 430,616 | 427,056     | 38,440  | 991,737 |

Source: EudraVigilance European database for suspected adverse drug reaction reports

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

6<sup>th</sup> August 2021

### EudraVigilance Report Rate

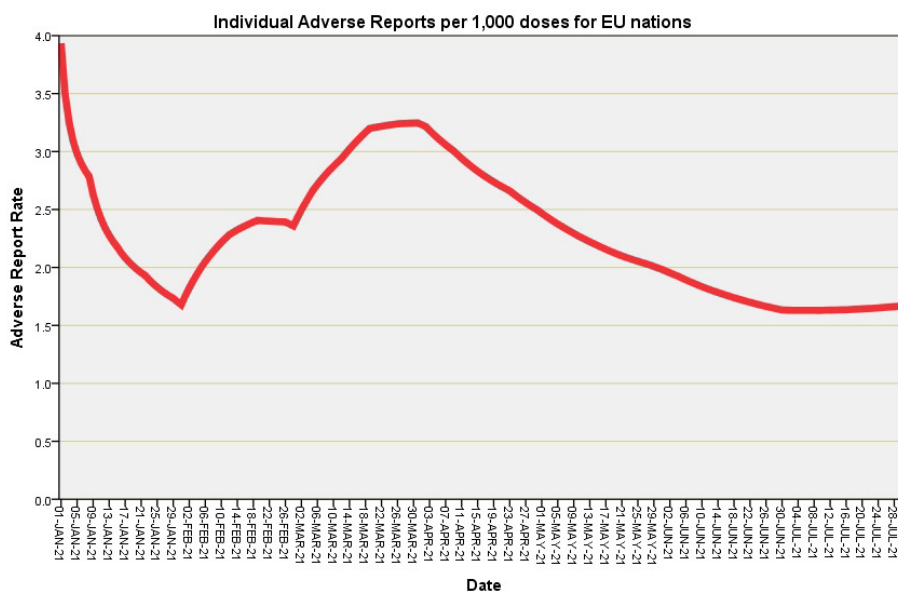
With weekly data from the European Centre for Disease Control (ECDC) for accumulated COVID vaccine doses sitting in my folder along with monthly data from EudraVigilance for accumulated individual adverse reports, I realised I could rationalise both datasets to a common daily time series and use linear interpolation to fill the missing gaps. With this done I derived a time series for adverse incident reporting rate (individual reports per 1,000 doses) and attach this for consideration.

Please note that this is derived from individual report data (one report = one person) so this isn't some strange multiple reporting thing whereby somebody reports five different adverse effects. The dose rate is derived from the sum of accumulated 1<sup>st</sup> and 2<sup>nd</sup> doses since this represents the number of vaccination opportunities after which a person may lodge an incident.

A stationary line segment means reports and doses are locked into a simple fractional relationship, a good example being the period 30 Jun – 28 Jul when the rate line bobbed around 1.7 individual reports per 1,000 jabs (0.17% report rate). Line segments with a positive slope indicate periods where the reporting rate is accelerating i.e. more and more reports per jab are being filed.

There are going to be several reasons for report rate acceleration. On the one hand it could be deepening of symptoms (a wider variety and/or more severe symptoms) arising from genuine vaccine harm; on the other hand it could simply be better use of the reporting system by healthcare professionals and the public. Then again it could be folk feeling unwell for various reasons (stomach bug, hayfever) and erroneously assuming this may be caused by the vaccine. Whilst there's no way of separating this causal tangle it's not something to dismiss lightly as many are doing for in that tangle lies the distinct possibility of serious harm and death.





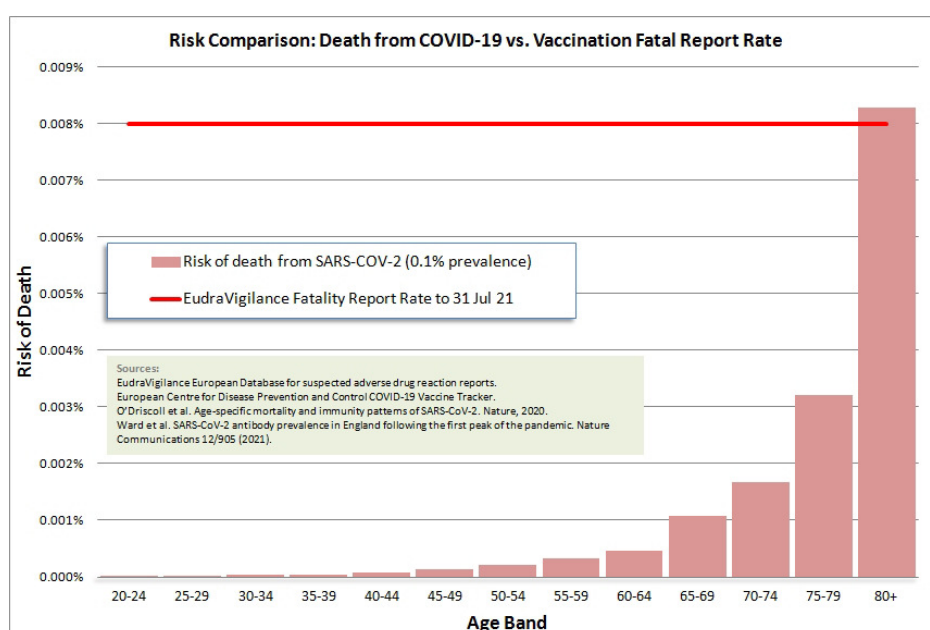
Source: European Centre for Disease Control; EudraVigilance

## Risk Comparison

With EudraVigilance figures for July in the pot I can now present my risk comparison chart once again. This chart takes estimates of the infection fatality rate from the paper by O'Driscoll et al (Age-specific mortality and immunity patterns of SARS-CoV-2. Nature. DOI: 10.1038/s41586-020-2918-0 (2020)) and combines them with the latest estimate of 0.1% disease prevalence for England (REACT study) to produce a series of estimated risk of death by age band. On top of this I have placed the 0.008% fatal report rate derived from EudraVigilance and ECDC data.

Whilst this chart is brimming with assumptions it usefully brings together the two elements that folk should be considering but are not, these being genuine risk of death from infection in the post-pandemic period and potential risk of death from vaccination. I say 'genuine' because folk (including professionals who should know better) are basing their internalisation of risk on media hype. I've seen folk shaking in their boots because death from COVID was "almost certain", despite their infection fatality rate being as low as 0.04%. And this is only if they get infected – if they don't get infected that rate drops to 0%; somehow this logic goes right over fearful heads.

I also say 'potential' because until a proper study is done we won't know whether that 0.008% fatal report rate following vaccination is an underestimate or overestimate. Right now we are all gambling whether we admit this or not, and judging from this chart we may conclude that, all things being equal, the gamble for anybody under 80 isn't worth it. The trouble is nothing is ever equal and we're swimming in data not fit for purpose.



7<sup>th</sup> August 2021

## ***A Quick Calculation***

In my previous post entitled Risk Comparison I wheeled out a very simple analysis comparing probability of a fatal outcome following vaccination with probability of a fatal outcome following SARS-COV-2 infection. This is not the world's most sophisticated piece of work and it rests on many assumptions, but it's the best I can muster until better data comes along. We may consider it to be a petit four, being a bite-sized savoury. To ensure folk understand the recipe here's a simplified step-by-step breakdown

1. Out of every 100,000 people 100 are likely to be infected with the virus if the disease prevalence is 0.1%.
2. Out of every 100 infected people 1 is likely to die if the infection fatality rate (IFR) is 1%.
3. Thus, out of every 100,000 people, 1 is likely to die with disease prevalence set at 0.1% and IFR set at 1%. This represents a combined fatality rate of  $0.1\% \times 1\% = 0.001\%$ .
4. EudraVigilance reports 20,595 deaths among 254,449,306 vaccinated individuals. This represents a fatality rate of  $20,595/254,449,306 = 0.008\%$  (red line on chart).
5. Slice the IFR unequally into 13 age groups according to work by O'Driscoll et al [1] and add food colouring (pink bars on chart).

Bon appétit!

### REFERENCE:

[1] O'Driscoll, M. et al. "Age-specific mortality and immunity patterns of SARS-CoV-2." Nature. DOI: 10.1038/s41586-020-2918-0 (2020).

## ***Care Home Deaths***

I haven't looked at any of this data yet but I have been stockpiling it since early last year. A good job too, for the kindly authorities have made it impossible for folk to now look back and see what happened in the spring of 2021.

One key spreadsheet I opened - the cryptically-named referencetable10052021114704.xlsx - had me scratching my head until I realised the vital three columns had been re-jigged to show cumulative weekly totals instead of weekly totals. Intrigued by this I unpicked the series to find a shocker a hump for non-COVID death during Apr - May 2020 that I shall be reporting on shortly.

The reason I'm digging about like this is that, aside from a peculiar blip last Apr - May, all cause death across England & Wales for 2020 doesn't show any sign of a pandemic. I had taken this blip to be an indicator of a genuine first wave viral outbreak that was short and sharp.

However, my thinking has recently swung round to that short, sharp shock being due to dangerous discharge and ill-treatment of our sickest and oldest patients, who were evacuated from hospital into care homes where DNR and nil by mouth was the order of the day, along with withdrawal of medications save for dosing with morphine and midazolam in what was effectively an end-of-life care pathway (whether or not end of life was imminent). Laws forbidding visitation and autopsy ensured the saga could be quietly and conveniently buried (literally).

For those wondering what midazolam does BNF tells me it is a water-soluble benzodiazepene causing profound sedation with amnesia, side effects of which are respiratory depression and respiratory arrest. Yes, you read that right - we were giving a known respiratory depressant to old folk with COVID-19 - and in very large doses too. So large, in fact, that Matt Hancock, our health secretary at the time, secured the entire 2-year output of all suppliers, going cap in hand to the French health service for more.

Over the next few days I'll be undertaking statistical analysis to determine just how much of that early spring 2020 hump was down to end-of-life care pathways implemented within UK care homes whether COVID-ridden or not.

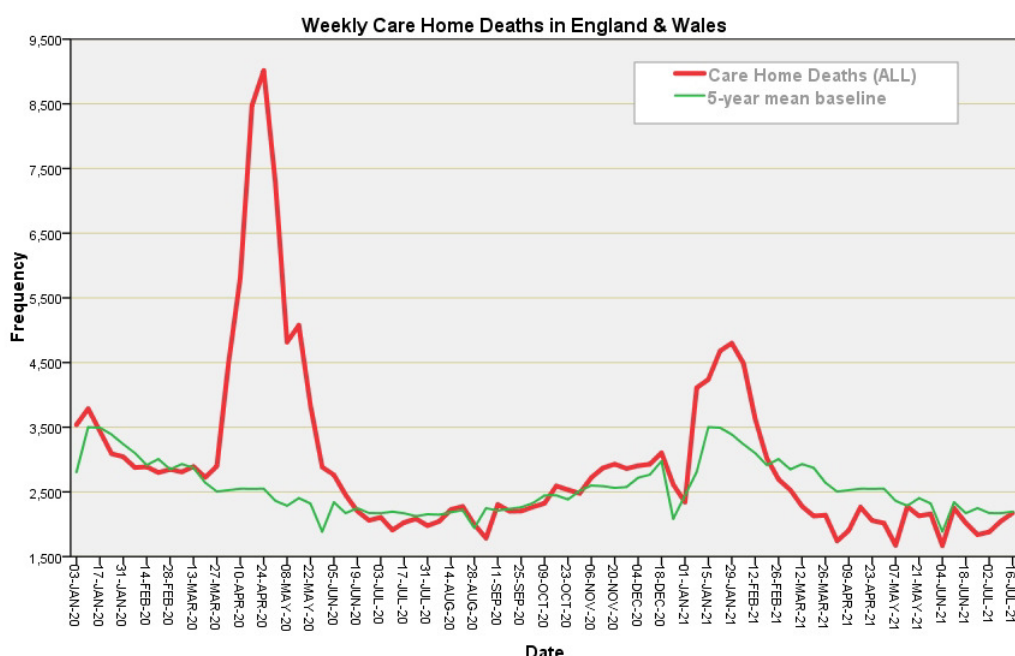
## ***Care Home Deaths (Time Series)***

In my first post on this subject I sketched a little of the background surrounding concerns over treatment of the sick and elderly in care homes during the first wave of the pandemic after many of them were moved there to free hospital beds that, in hindsight, were never needed. I talked about an end-of-life care pathway involving DNR, nil by mouth and heavy use of morphine and midazolam, the latter being a respiratory suppressant in high doses. Emergency laws prevented visitation by relatives and autopsies. Let us now look at what the official data reveals in three very telling slides...

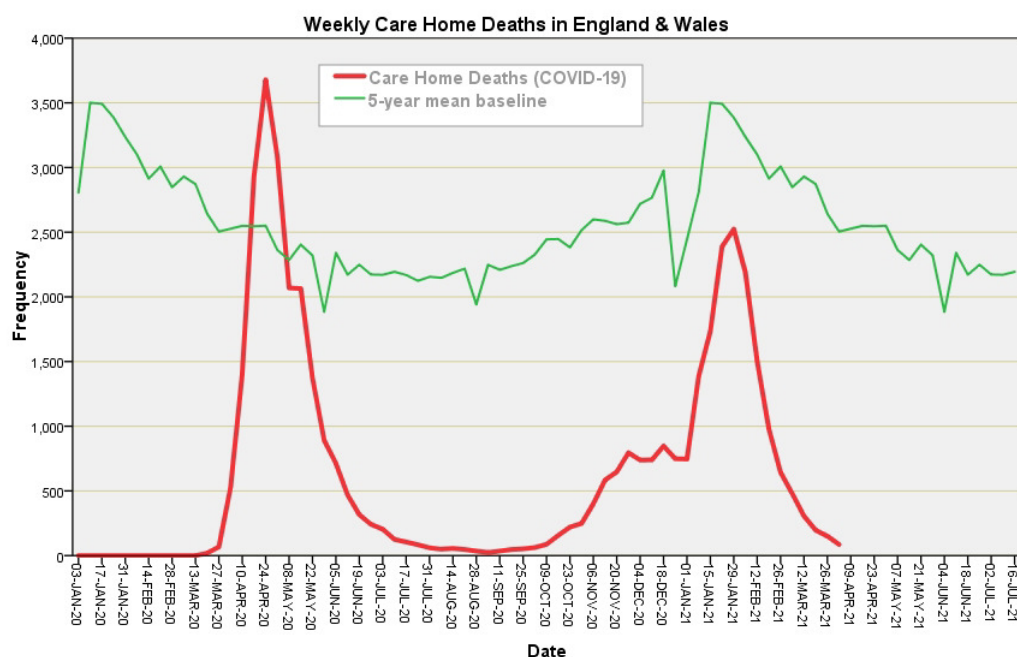
In the first slide we observe weekly counts of deaths within care homes across England & Wales to the extent that the latest datafiles from the Office for National Statistics (ONS) permits. The ONS very usefully provide the prior 5-year mean weekly count for the corresponding week which acts as a reference baseline so we may judge perturbations (green line). A monstrous initial peak dominates the series but what intrigues me is how modest the so-called third wave of death looks in comparison: in later analyses I shall be estimating excess death. My initial thoughts are that most of our vulnerable and elderly were wiped out during April and May.

In the second slide we see that green baseline again but this time I have plotted deaths ascribed to COVID. As group members will by now appreciate assigning cause of death in the UK isn't what it seems, with automated software (MUSE) dictating WHO guidelines are followed even if this doesn't make clinical sense. Any physician relying on PCR test results is also going to fall foul of test reliability, thus death counts come with a large margin of error. Setting all this aside there are two surprises in store. The first is that deaths allegedly due to COVID during the first wave make a surprisingly modest impression in comparison to the mean baseline – something I was not expecting! Even more surprising is that COVID care home deaths during the third wave fall below the 5-year baseline. No doubt some folk will be keen to praise the vaccine but we must also bear in mind that it could well be adverse reaction to vaccines that generated the final spike! Naturally I shall be examining the veracity of both arguments over the next few days.

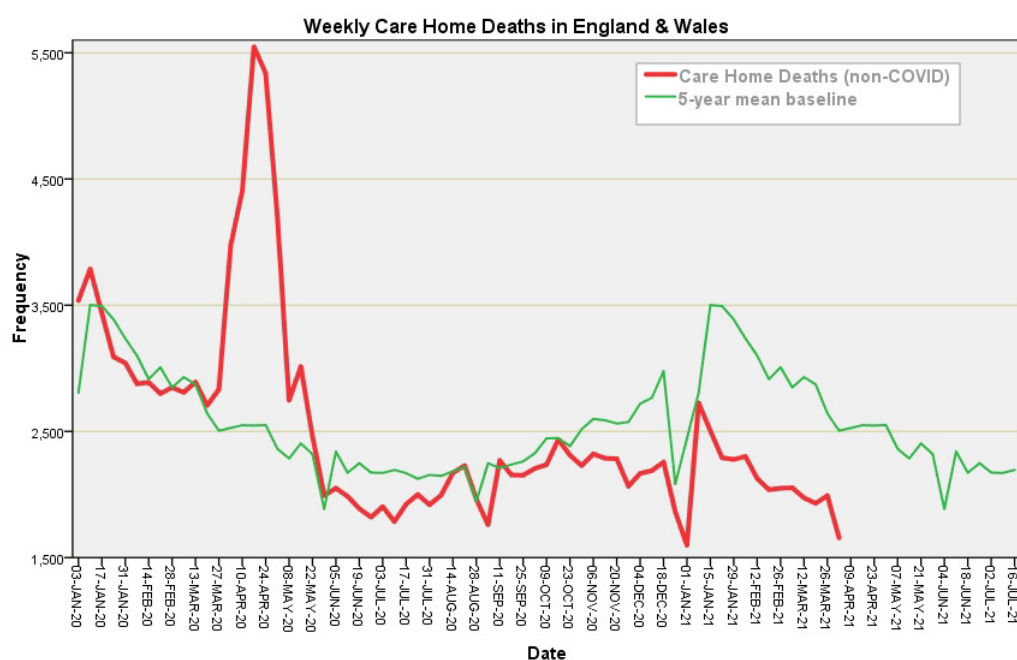
The third slide is quite something. We now see that the incredible surge in care home deaths during the spring of 2020 wasn't due to COVID. This is the spike that had been camouflaged by presenting the data as an accumulated series, and this is the spike that shocked me when I unpicked the data. The authorities are going to great trouble to hide the fact that a massive surge in non-COVID death occurred within our care homes during spring of 2020. We don't see such a surge during the so-called third 'wave' of what is going to be seasonal death during the winter of 2020/21, with weekly deaths now running well below the 5-year baseline.



Source: Office for National Statistics



Source: Office for National Statistics



Source: Office for National Statistics

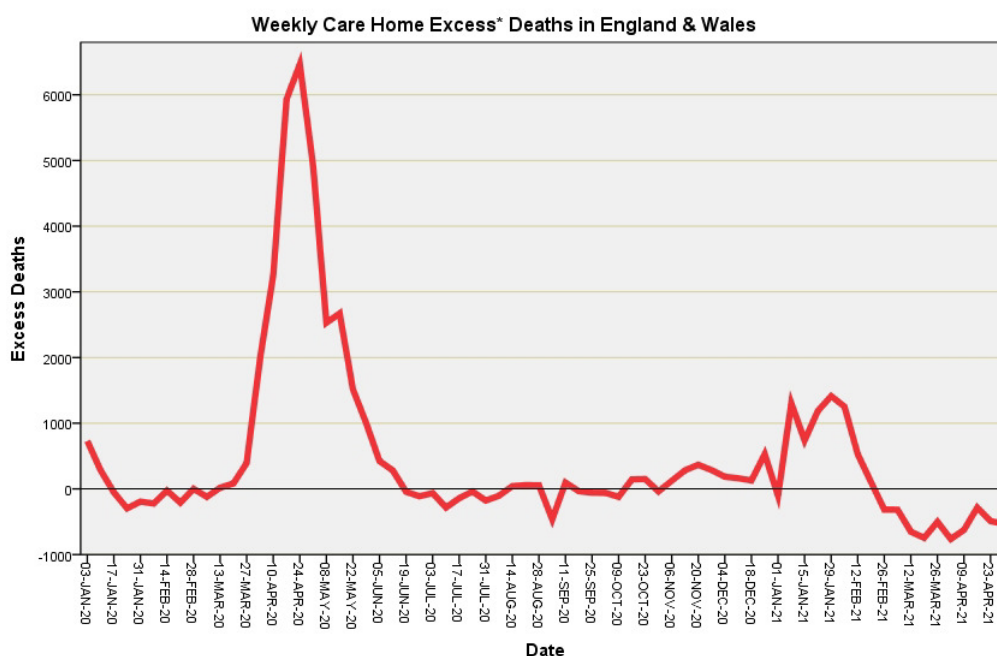
8<sup>th</sup> August 2021

## Care Home Deaths (Excess)

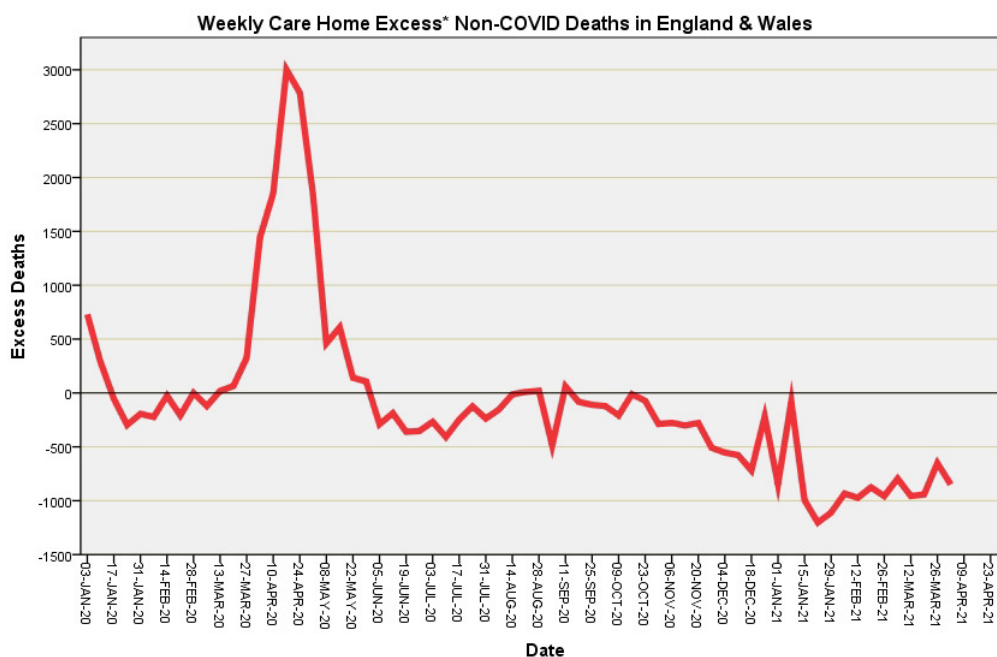
In my first post on this subject I sketched a little of the background surrounding concerns over treatment of the sick and elderly in care homes during the first wave of the pandemic after many of them were moved there to free hospital beds that, in hindsight, were never needed. I talked about an end-of-life care pathway involving DNR, nil by mouth and heavy use of morphine and midazolam, the latter being a respiratory suppressant in high doses. Emergency laws prevented visitation by relatives and autopsies. In my second post we saw evidence of these grotesque policies in action with a substantial spike in weekly non-COVID deaths between March and May 2020, and I promised to derive figures for excess deaths.

I now present two further slides using the method adopted by the Office for National Statistics (ONS) for estimating excess death, this being to subtract the prior 5-year (2015 – 19) mean count from observed counts for the corresponding week. In the first slide we may observe the excess for all care home death and in the second slide we may observe the excess for non-COVID care home death.

Over the 11 week period w/e 20<sup>th</sup> March 2020 - w/e 29<sup>th</sup> May 2020 some 57,314 care home residents within England & Wales died, 26,575 of which would have normally been expected in accordance with the 5-year mean rate (46.4%). Of the remaining 30,739 excess deaths some 18,104 can be attributed to COVID (58.9%) leaving a somewhat shocking 12,635 inexplicable non-COVID excess deaths (41.1%); inexplicable, that is, until we realise just what murderous policies were implemented across the private care sector during this period.



Source: Office for National Statistics; \*observed deaths - 5-year prior mean baseline



Source: Office for National Statistics; \*observed deaths - 5-year prior mean baseline

## What's Going On?

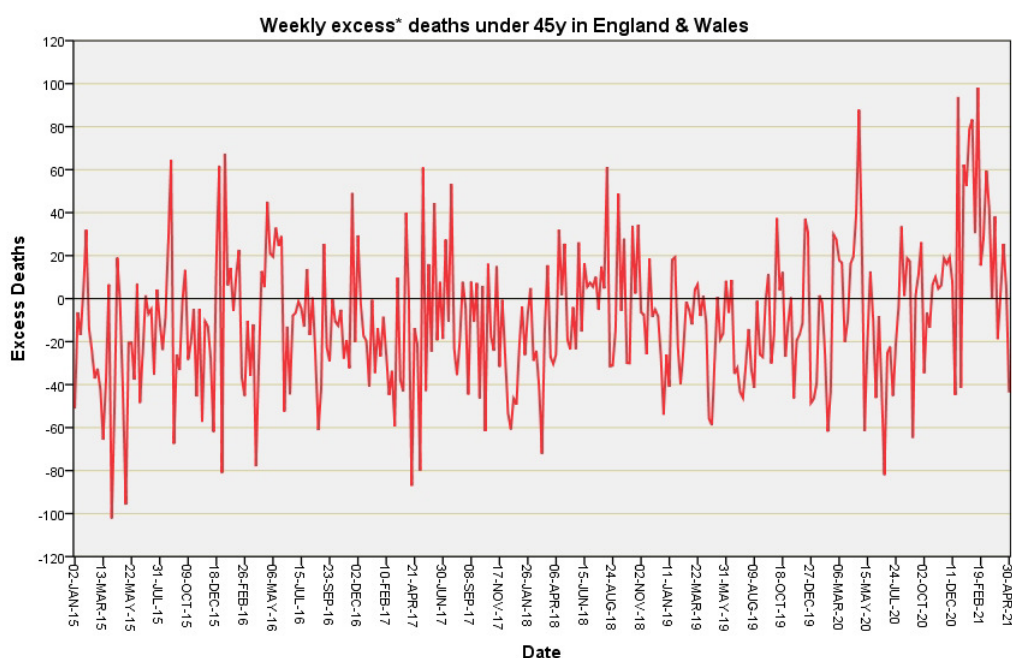
In my series of posts on care home deaths we discovered a grotesque truth that end-of-life care pathways have been abused, leading to substantial excess deaths in non-COVID cases during the spring of 2020. I wondered how many COVID cases were also hastened to an unnecessary death and whether the same deadly policy was applied for the so-called 2nd and 3rd waves. In short, I sat wondering just what the heck was going on with care of the elderly and whether this hidden aspect to healthcare could explain away the pandemic.

I figured the answer lay in looking at all cause death in the under 45s on grounds that a genuinely novel and deadly respiratory viral outbreak would show in excess death for this age group. I thus downloaded weekly data from the Office for National Statistics (ONS) for the period 2010 - 2021, broke out the under 45 category and derived the 5-year mean baseline for corresponding weeks for this group of people. This series was then standardised for changes in population over this period to arrive at weekly standardised excess all cause deaths under 45y in England & Wales – a bit of a mouthful, I admit!

This series is presented in the first slide. There are a couple of features I shall draw attention to starting with an underlying modest positive trend estimated at +3.69 deaths per year (OLSR;  $p < 0.001$ ). Unlike deaths in the elderly there's no obvious seasonal pattern, so respiratory illness isn't a major issue with this younger group as we may expect. Aside from one spike of +88 excess deaths w/e 24th April 2020 there's no sign of the first wave of the pandemic, which is rather odd given the excessive news coverage, general panic and draconian measures. Neither is there any sign of the 2nd wave of Oct – Nov 2020, which is doubly odd. In fact, it's not until we get to the 3rd wave that we start to see evidence of something happening within the younger population.

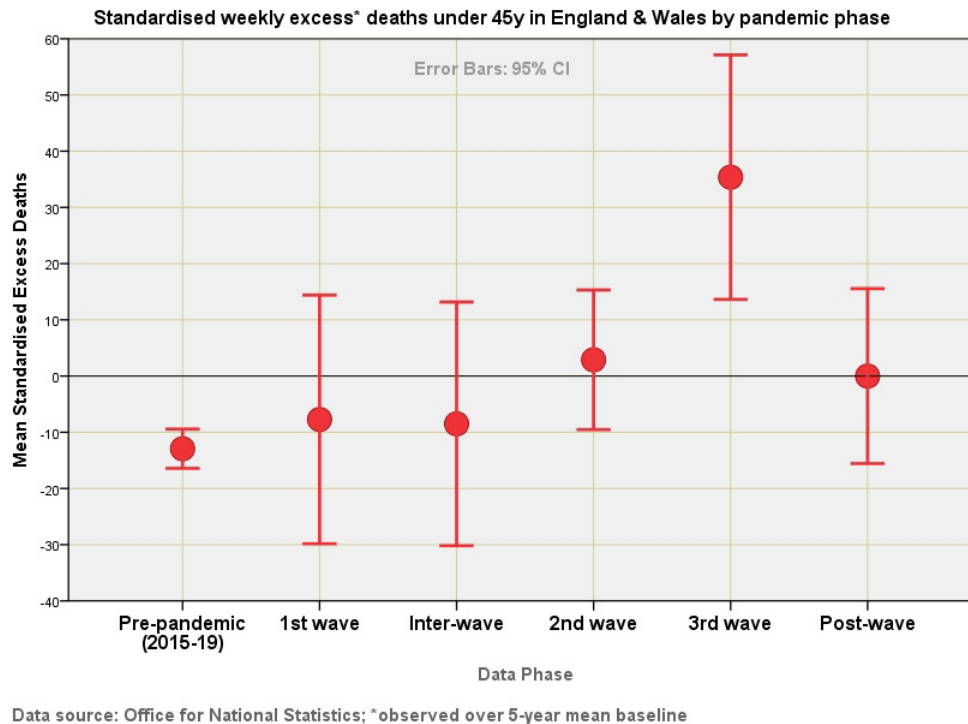
To cross-check that our eyes are not playing tricks I derived an error bar plot from this series showing mean excess deaths by pandemic phase. This raised an eyebrow somewhat for we can now clearly see that there is absolutely no sign of elevated mean weekly excess death during the 1st wave, with the 95% confidence interval for the 2nd wave straddling the zero axis. We may conclude absence of excess death in the under 45 age group for first two pandemic phases, which is something of a shocker given there was supposed to be a deadly virus ripping through the population.

In contrast, we do indeed see something unpleasant happening in the under 45 age group during the 3rd phase. If this was due to the virus how did it manage to wait until then to strike, and especially at a time when the under 45s would presumably have been developing natural immunity from the 1st and 2nd waves? This simply does not make sense. Just what is going on?



Source: Office for National Statistics; \*observed deaths - 5-year prior mean baseline





11<sup>th</sup> August 2021

### ***Intensive Care National Audit & Research Centre (ICNARC)***

I'm just getting to grips with this useful online resource that provides a snapshot of what is going on at the sharp end. A major beef I have with these reports is reliance on something they call 'confirmed COVID-19', for which a rigorous definition is not provided. An unpleasant exchange with a junior medic caring for COVID ICU cases in a London hospital revealed PCR is the primary diagnostic but that "other tests are also used", though he failed to stipulate exactly what. In his substantial unit at present there are just 7 COVID cases – 2 unvaccinated and 5 vaccinated, the unusual ratio of which he didn't pass comment.

Tim Foxon, in a substantial and informative thread below, raises concerns about a possible rise in post-vaccination antibody dependent enhancement (ADE). Going through the latest ICNARC report (6/8/21) there is clear evidence of a sharp rise in ICU admissions in all UK regions since 1st May including a surge in non-elective non-COVID cases since January (Figure 14). What follows are notes from my first quick glance at this valuable report...

In figures 15 – 18 the impact of lockdown policy during 2020 (particularly Apr/May) is abundantly clear, with suppressed ICU admission rates for acute myocardial infarction (AMI – 'heart attack'), stroke, trauma and self-harm. These missing cases that never made it to the ICU likely didn't survive but were no doubt counted as COVID deaths. Interestingly, the junior medic didn't see it this way, insisting lockdown was necessary to prevent tens of thousands of COVID deaths. Sweden (sorry, I sneezed). Ideally the junior medic would talk to the ambulance crews and/or GPs to get a grip on the wider world of primary care but intensivists don't do that sort of thing.

Figure 19 is worth a look for we see evidence of lower rates of admission for those with non-COVID pneumonia (no isolated organism) for 2020/21 yet nobody is asking why this should be so. Figure 20 is a corker, revealing the magical disappearance of viral pneumonia (influenza) from intensive care units during 2020/21 compared to 2016, 2017, 2018 and 2019. No querying here either.

Table 1 reveals ICU patients in the 1st May cohort are younger than the 1st Sep 2020 – 30 Apr 2021 cohort by a mean difference of 9.7 years. This is a big difference. Either we have a viral variant that can calculate somebody's age or the progressive jabbing of younger folk is having an impact on ICU admissions. Figure 21 usefully provides a histogram of age at admission for the 1st May cohort where we may note a preponderance of 40-49 year-old males (14.1%) and 50-59 year-old males (13.5%). A Chi-square test of association revealed highly statistically different gender differences ( $\chi^2 = 42.77$ , 6 df,  $p < 0.001$ ) and it's worth asking why males in the 40 – 69 age group are grossly over represented

Interestingly, in table 3 we see that the mean APACHE II score for the 1st May cohort, at 12.5, is lower than the 1st Sep 2020 – 30 Apr 2021 cohort mean score at 14.4, this difference being highly statistically significant (Independent samples T-Test,  $p < 0.001$ ). For those not familiar APACHE II (Acute Physiology And Chronic Health Evaluation) is a severity-of-disease classification system that is applied within 24 hours of

admission of a patient to an ICU, being an integer score ranging from 0 to 71. It is based on several physiological measurements, with higher scores corresponding to more severe disease and a higher risk of death. Thus we see that, contrary to media claims, recent viral variants are resulting in less severe cases passing through our ICUs.

Aside from thrombotic events hypoxaemia is the most serious aspect to the condition we are calling COVID-19 and in table 3 we may note PaO<sub>2</sub>/FiO<sub>2</sub> ratios of 13.8 and 13.0, these representing moderate to severe hypoxaemia with estimated mortality risk of 32% and 45%. For those not familiar the PaO<sub>2</sub>/FiO<sub>2</sub> ratio is the ratio of arterial oxygen partial pressure (mmHg) to fractional inspired oxygen, being a widely used clinical indicator of hypoxaemia. We may note that its diagnostic utility is controversial, with many disadvantages, hence adoption of alternatives by some units. In figure 27 we discover 445 patients died in ICU with a further 16 dying in hospital out of a total of 1,401 known outcomes (32.9% mortality), which corresponds well with lower end estimates of mortality from the PaO<sub>2</sub>/FiO<sub>2</sub> ratio.

In table 7 we find ICU deaths standing at 9,882/25,779 (38.3%) for those with known outcomes for the 1st Sep 2020 – 30 Apr 2021 cohort, this dropping to 445/2,018 (22.1%) for the 1st May cohort, this difference being highly statistically significant (Poisson means test,  $p < 0.001$ ). This finding supports my earlier conclusion that, contrary to media claims, recent viral variants are resulting in less severe cases passing through our ICUs.

In the same table we see advanced respiratory support dropping from 55.4% for the 1st Sep 2020 – 30 Apr 2021 cohort to 31.7% for the 1st May cohort, this difference also being highly statistically significant (Poisson means test,  $p < 0.001$ ). We may see this decline balanced by an increase in basic respiratory support only, together with an increase in cases not needing any respiratory support, both differences being highly statistically significant ( $p < 0.001$ ). A similar situation can be found with cardiovascular support ( $p < 0.001$ ), renal support ( $p < 0.001$ ) and neurological support ( $p < 0.001$ ) but not liver support ( $p = 0.110$ ). This is pretty conclusive evidence that supports my contention that recent viral variants are resulting in less severe cases passing through our ICUs both in terms of death and organ systems affected.

We may note that the government started its media campaign to encourage the vaccination of pregnant women toward the end of June. In figure 28 we may observe a worrying spike in ICU admissions for pregnant women during June, and especially July. This should be of great concern but I note the media campaign continues regardless. A national audit is worthless if the NHS executive, PHE and DHSC do not act on results.

In figure 30 we are presented with a Kaplan-Meier plot for 28-day in hospital outcomes and may note the enhanced survival prospects for those being admitted to intensive care since 1st May 2021. Though overall p-values by category are not given we may glean from the 95% confidence interval boundary that differences are highly statistically significant. This finding supports my conclusion that recent viral variants are resulting in less severe cases passing through our ICUs.

Figure 31 offers a hazard ratio plot derived from Cox Regression with adjustment for subgroup variables enabling us to compare the characteristics of ICU admissions between the earlier period of 1st Sep 2020 – 30th April 2021 and 1st May 2021 – 30th June 2021. The best way to decipher this is use the dashed vertical line and realise values to the right mean 'more than', with values to the left meaning 'less than'. Thus we see a preponderance of deaths in the 50-59 year age group cropping up in the most recent period along with several other interesting trends.

In figure 32 we are presented with a Kaplan-Meier plot for 90-day in hospital outcomes and may once again note the enhanced survival prospects for those being admitted to intensive care since 1st May 2021. Though overall p-values by category are not given we may once more glean from the 95% confidence interval boundary that differences are highly statistically significant. This finding also supports my conclusion that recent viral variants are resulting in less severe cases passing through our ICUs.

If I can find more time I'll chew on this report some more but hopefully this will give folk a flavour.

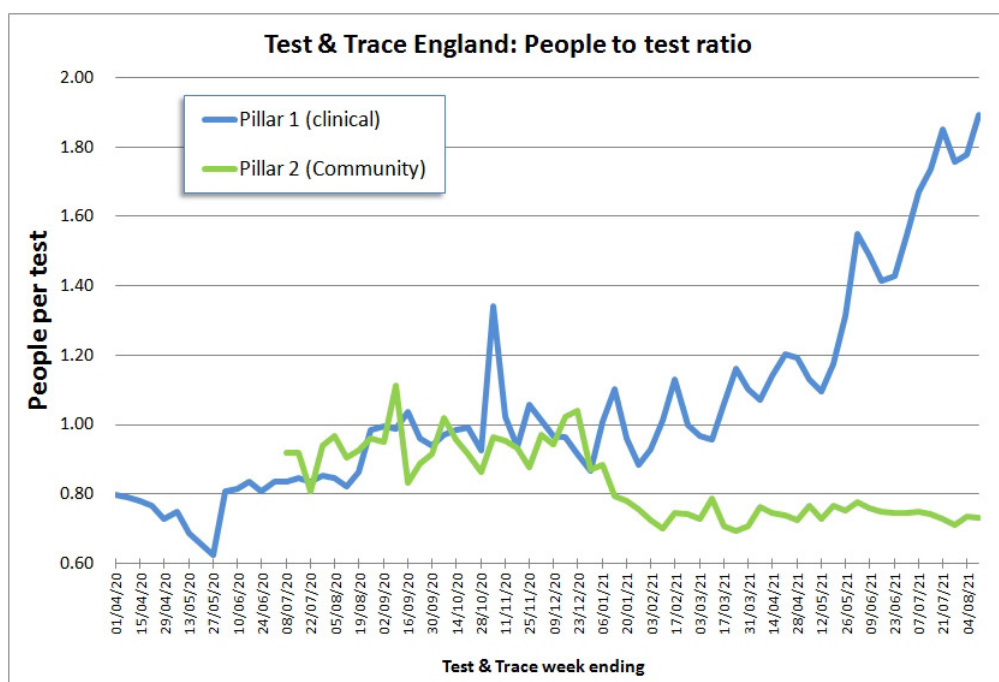
<https://www.icnarc.org/Our-Audit/Audits/Cmp/Reports>

## More tests, vicar?

This morning I set about updating all of my databases using info downloaded from the UK GOV coronavirus dashboard, the NHS England hospital activity pages and the NHS England Test & Trace pages. I'm pretty much there but now face a perennial problem: what to do about numerical tripe. Test & Trace totals are now available to week 80 (w/b 5<sup>th</sup> August) for which we discover 900,268 folk tested under the pillar 1 scheme (those with a clinical need) and 3,191,501 folk tested under the pillar 2 scheme (wider community). This is all well and good until we discover that only 475,978 viral tests were conducted under pillar 1. Either folk have been sharing tests as a gesture to the environment or we are 424,290 tests short of a BBQ.

It wasn't always like this. There was a time when you understood just how misleading the misleading numbers were. These days even the misleading numbers are misleading. By way of example I have plotted out the ratio of people per test by week for each pillar. Line segments bumbling along under a value of 1.00 are good because it means we had enough tests to go round. Lines exceeding a value of 1.00 indicate there were more people tested than there were tests. Whilst we may forgive small excursions that will arise from administrative glitches what we can't forgive is the runaway gravy train that is pillar 1 testing from January 2021 onward.

Either they are double counting people or they are failing to include all tests undertaken. Another possibility is that folk being tested under both pillar 1 and pillar 2 schemes are only having one set of test results counted. Either way until we balance the books we can't say anything about disease prevalence.



25<sup>th</sup> August 2020

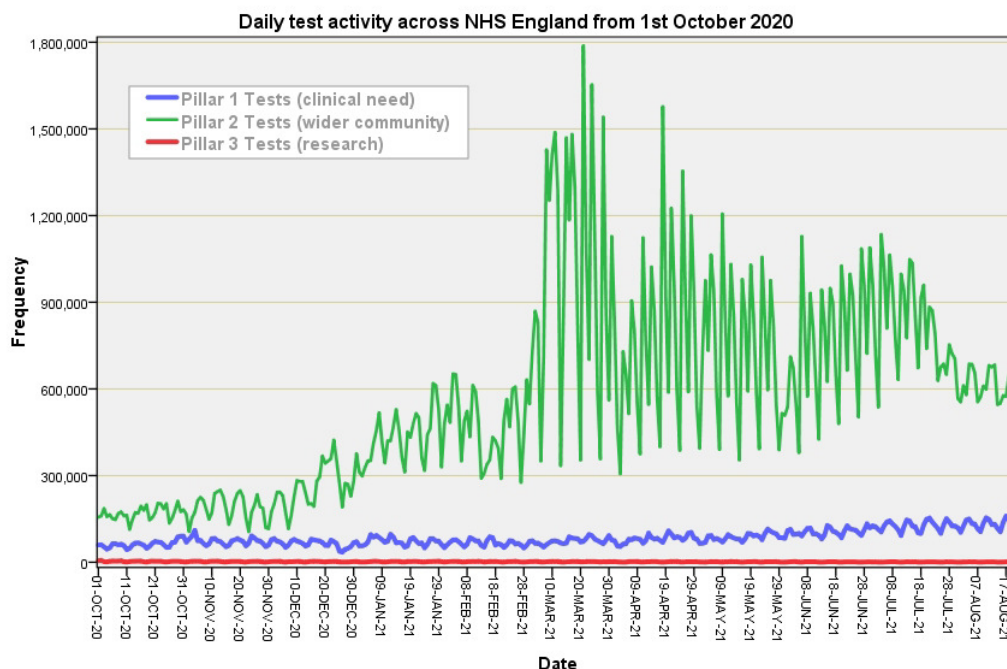
## Testing, testing...

Now that I've had time to make the necessary adjustments to the numbers of tests reported such that the number of tests equals or slightly exceeds the number of people tested I can wheel out two potentially boring slides. The first reveals just how much testing is going on by pillar. This is important because the more testing we do the more likely it is that we'll generate positive test results (whether true or false positives). This basic fact has its roots in the Laws of Probability such that if we roll a die once we only have a 1 in 6 chance of obtaining a six, so are likely to be disappointed, whereas if we keep rolling the die we'll most certainly get a six at some point; this being the same with any diagnostic test, and particularly so with PCR.

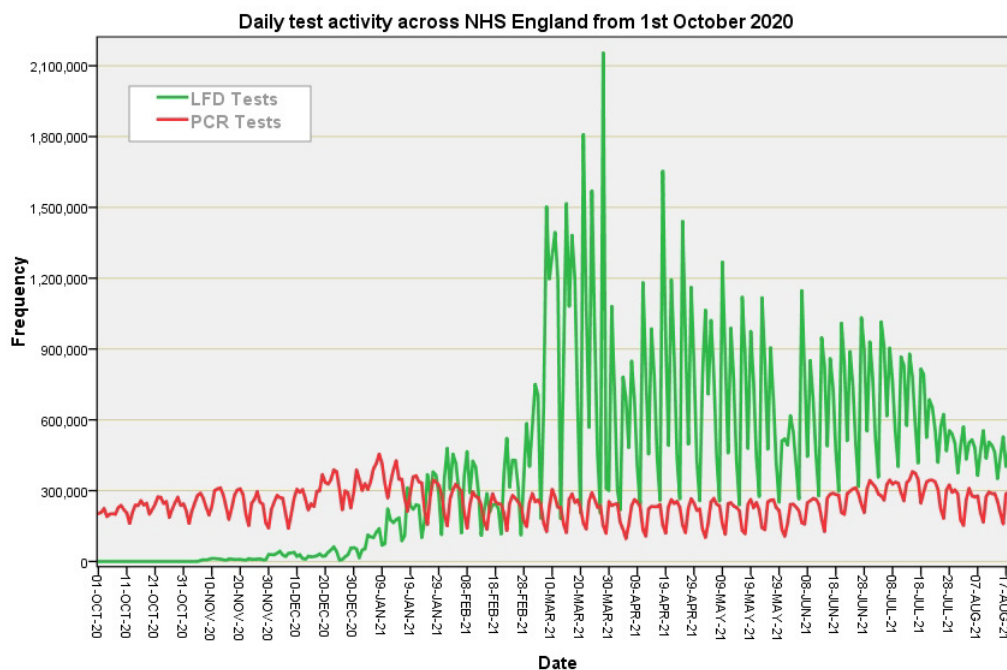
In this first slide we see Her Majesty's Government roll the die a fair few times in the wider community during March 2021, then again in April, and you can see them try hard once again in June. The tail-off in August is worth keeping an eye on because that tells me they want to alter the numbers. I'm going to bet good money on them doing some serious rolling this winter unless they decide to 'prove' efficacy of the

vaccines. On the clinical side there isn't much going on but that blue line is nudging up slightly. Uptake of intake will be one explanation, but if intake isn't on the uptake then they'll be resorting to sticking more sticks up the same patient's noses. Research doesn't get much of a look-in by comparison.

In the second slide we get to see that those pillar 2 (wider community) tests are largely down to use of lateral flow kits, whereas PCR – the mainstay of the clinical side – is chugging along. The little humps in January and July will have generated a flurry of positive results (both true and false).



Source: <https://coronavirus.data.gov.uk/>



Source: <https://coronavirus.data.gov.uk/>

## ***Rolling The Die***

In my last post entitled Testing, testing... I offered the analogy of rolling a six on a die and this struck a chord with a few members, so I'm going to stick with this to explain a hidden bias in case counts.

If the PCR test was 100% reliable then all we'd need to do is test each person once and we'd know for certain whether they were carrying the virus or not at that moment in time. This would not tell us whether they are very sick, mildly symptomatic or whether they are capable of infecting others – we'd have to infer this from their viral loading.

All viral loading boils down to is having their swab sample pop up as positive after a handful of test cycles (low amplification) as opposed to having their swab sample pop up as positive after 40+ cycles (high amplification) – if you are swimming in virus then you don't need much amplification to get a result.

This is the theory, at least, and I'm ignoring all manner of murky issue as to what test primers can and cannot differentiate. We're also making an assumption that activated primers must mean SARS-COV-2 is lurking and that SARS-COV-2 is responsible for the condition we're calling COVID-19. Sure there's research claiming proof but I've yet to see anything convincing from an organisation without vested interests. If you take a slice of lung from a deceased patient and it is brimming with SARS-COV-2 is that sufficient evidence of cause?

Several healthcare professionals have confided that they keep testing patients until they get a positive test, which is back to rolling our die to get that six. Nobody questions whether the positive test is a true or false positive and so the patient gets shoved onto a COVID ward and treated accordingly.

Stats-wise the data authorities ignore the many negative tests and only count the positive test, the official wording being "...with a positive test being prioritised over a negative test." In our die rolling analogy this means they're rolling it as many times as they want but only shouting "another case!" when they get that six. Anybody listening will believe cases are piling up with every (ahem) 'roll'.

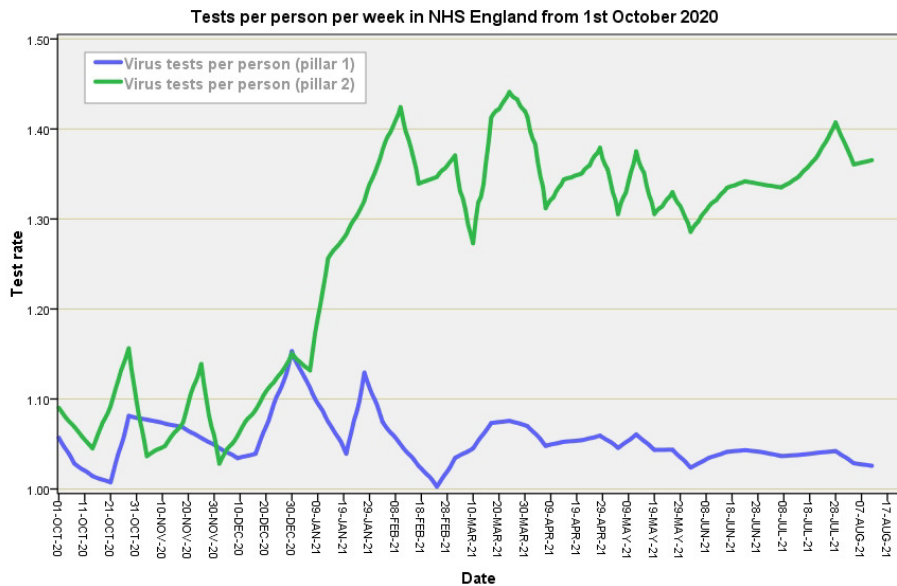
Now the interesting thing here is that this is only possible if the PCR test isn't doing its job as claimed. If the test was 100% reliable then we'd have healthcare professionals running test after test on patients in their care and not ever getting a single positive result (if they were clear of the virus). In techno-babble this would imply a high level of test specificity.

Although the authorities claim test specificity is seriously high this is not the impression I get talking to folk at the coal face – they roll the die half a dozen times and bingo! Admittedly, these could be patients carrying the virus whose first few test results were false negatives but the interesting thing here is that the healthcare workers also state that "these patients are never ill with COVID".

Whatever the situation, the plain fact is that we get more sixes by rolling that die and thus we get more 'cases' by rolling that test. We can either roll lots of dice all at once (testing huge numbers of folk every day) or we can roll the same die many times (testing the same person many times). This isn't a problem providing you come clean about the numbers or make adjustments to case counts but the authorities do neither. What I've done, therefore, is to conjure a slide using official data that reveals the same-die-many-times trick.

We can see that pillar 1 testing (tests for those with a clinical need) got a bit jittery back in Dec/Jan and this alone would have bumped up hospital cases regardless of what the virus was or wasn't doing. Things have now settled down for the summer, so with the die rolling less we'll get less cases (all things being equal).

Pillar 2 testing (wider community, especially the education sector) went wacko in early January and this will have generated a sizeable peak. A shift from ~1.10 tests per person to ~1.40 tests per person doesn't seem much until you multiply the factor increase (x1.27) by the number of people this applies to each and every day. That factor increase also means a new case report rate that was bumbling along at 100 per day would leap to 127 per day simply because we are rolling the die more times and getting more sixes.

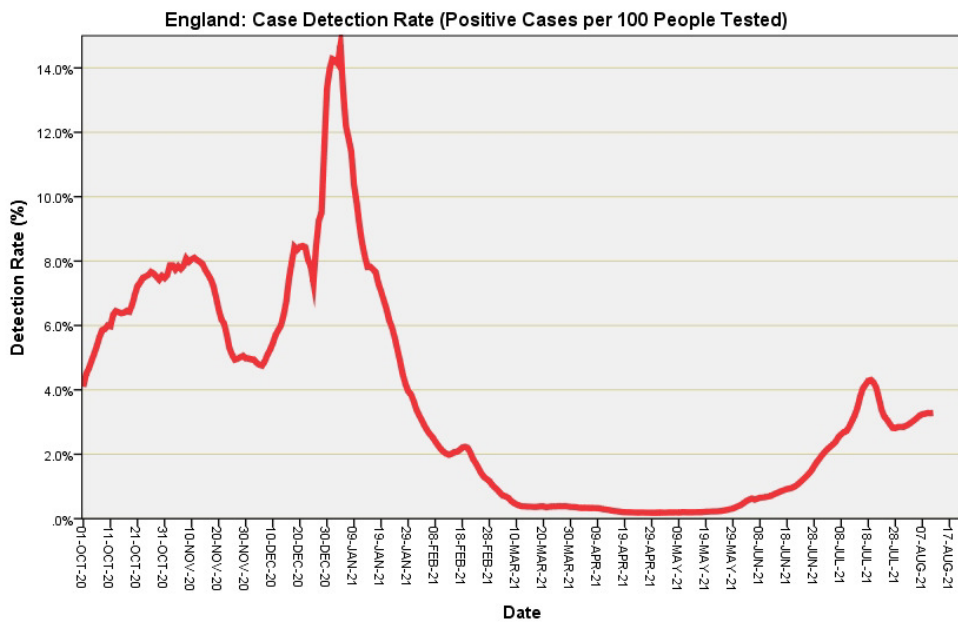


Source: <https://coronavirus.data.gov.uk/>

**29<sup>th</sup> August 2021**

### ***Case Detection Rate Update***

A quick update on the current situation across NHS England, with data adjusted for missing tests. The case detection rate is a peculiar beast because it is not based on random sampling of the population. Instead, they target areas and people and get up to all sorts of tricks that introduce bias, so we don't really know what this curve is showing other than the desire of the authorities.



Source: <https://coronavirus.data.gov.uk/>

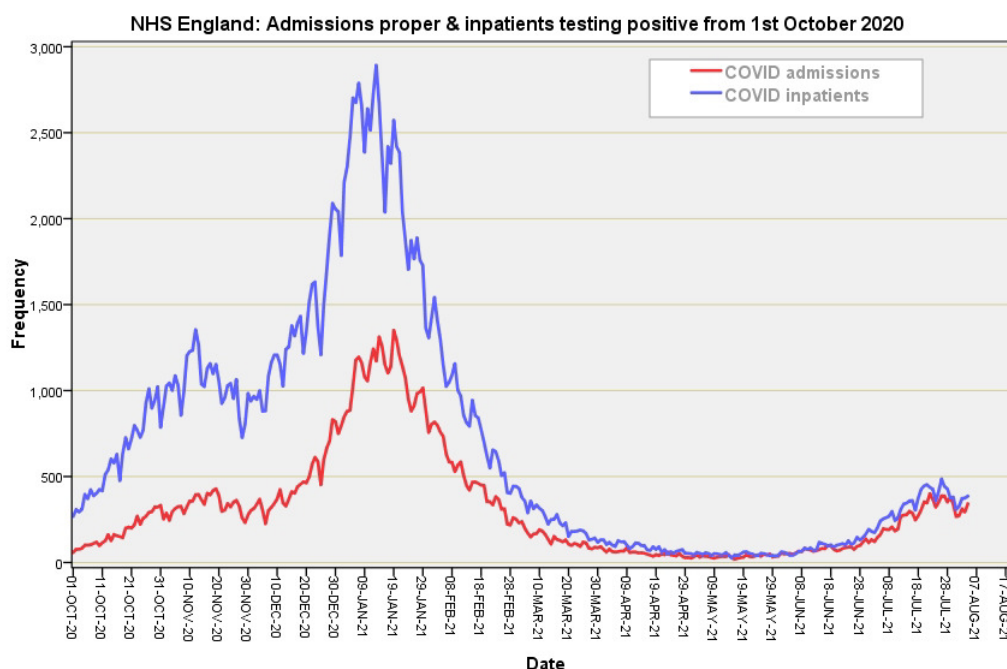


## Front Or Back Door?

Another slide in my series of updates of the position across NHS England, this time showing the daily count of admissions and inpatients testing positive. Please don't make the mistake of thinking a COVID admission is somebody who is sick with symptoms, infectious or even carrying any SARS-COV-2 (false positive). What we are looking at are people going to hospital for any reason whatsoever who also happen to test positive beforehand.

Please also don't make the mistake of thinking an admission leads to day bed use or overnight stays, and please don't think that the admitting hospital is a place that even treats COVID! Thus a pregnant women being admitted to a maternity unit to give birth will count as a COVID admission if she also happens to test positive beforehand. Fall off a ladder and you could end up being counted. It's also worth thinking about all the re-admissions of folk who need regular care and treatment who might happen to test positive – re-admission of the same person counts as an admission.

As regard inpatients these are folk already in hospital for more or less anything you can imagine who happen to test positive at some point during their stay. If they do test positive they are counted as an admission. What we are looking at are lots of numbers that have no clinical meaning. What would be clinically meaningful are admissions of those who are being admitted *\*because\** they're suffering COVID symptoms and are testing positive with a low cycle threshold. This data is not made available to the public.



31<sup>st</sup> August 2021

## NHS Bed Use

This morning's update slide provides a glimpse of bed use by COVID designated inpatients as a percentage of all cases. We may think a COVID patient in a bed in hospital is a sure sign of the pandemic but this is not necessarily so – all it means is that these are patients who have tested positive at some point. They may also have tested negative several times over but these results are ignored, the official data definition stating "...with a positive test being prioritised over a negative test". Several nurses have confided that patients are tested until positive and then wheeled to a COVID ward – we're back to rolling that die again!

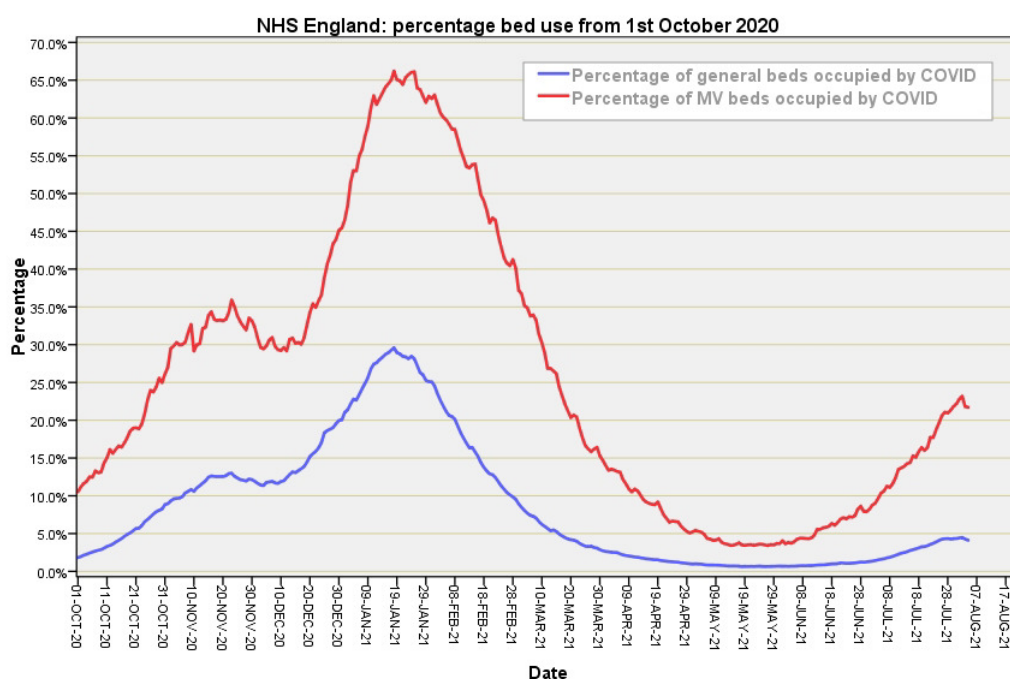
So, these are curves of people in beds who may not even be carrying SARS-COV-2 (false positive). They may not be showing any symptoms and they may not be receiving any treatment for COVID. Our healthy pregnant women of yesterday who has just given birth but who tested

positive will count as one of these beds until she goes home. Same for the chap who fell off the ladder. We simply have no idea how much demand for beds there is from folk sick with COVID who need to be treated for COVID because this data is not revealed to the public.

Anybody thinking MV (mechanical ventilation) bed use is a sure sign of the pandemic needs to think again, since we are back to positive test results from PCR and serological tests that also have issues. MV bed use doesn't mean the MV part is used and if it is it can be for any of the many reasons we've needed to use MV beds over the years. Old-fashioned respiratory illnesses never went away, they just got forgotten about. Neither is MV bed use necessarily a sign of good COVID patient management, as some of you will gather from reading the medical literature.

Sitting on the servers of every NHS Trust is the very data we need to ascertain what the situation really is and is not. I've also no doubt that some enterprising registrars in respiratory or general medicine will have put heads together with their clinical audit facilitator and devised ways of tracking treatment and outcomes.

It would be wonderful if I could present this slide broken down into beds used for treating COVID cases with COVID treatments as opposed to beds used in the management of positive-testing patients. The fact that I cannot do this simple thing without relying on a whistleblower to hand me data tells us volumes.



Source: NHS England Hospital Activity

# John Dee, His Almanac

1st September 2021

## *Certified & 28 Day Deaths*

This morning's update slide provides a glimpse of COVID death. There's a great deal I could say about counting death since this was my job for 25 years. I'll keep it short and start by saying COVID death figures are not what they seem. I'm sure most group members realise there's a difference between died from and died with, and that the public get to see the died with data with sufficient spin to make it look like died from.

When it comes to understanding the big clinical picture died with is every bit as important as died from - in the trade we call this a co-morbidity, a common one being high blood pressure (hypertension). Mixing cause and co-morbidity in outcomes analysis means clinicians can bark up the wrong tree, but the government - with umpteen expert advisors - have decided that isn't as important as needlessly scaring the public.

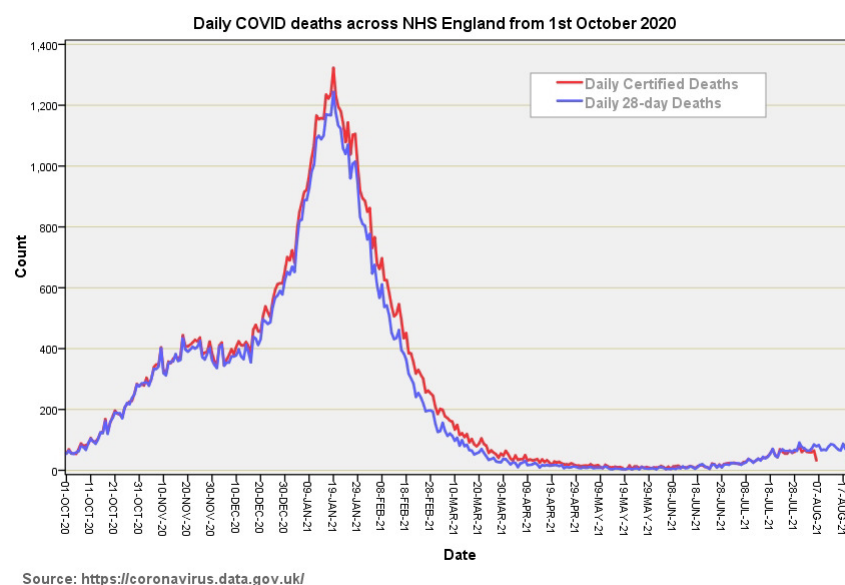
To earn a 28-day death tag all somebody has to do is test positive before they die of more or less anything folk normally die of (including gunshot wounds). We would think that certified death data would surely tell us the truth but this is not so. In the UK the death certificate consists of two sections. Section I is where a physician will enter cause of death and section II is where they will enter co-morbidities. If COVID is considered a significant co-morbidity it gets entered in section II but the data authorities will count this as a 'certified COVID death'. It is certainly certified but we must always read the clinical small print!

Another game played is called Multicausal and Unicausal Selection Engine (MUSE). This bit of software was updated on 1st January 2020 and sits in the IRIS 5.5 coding suite used by the Office for National Statistics. What this clever bit of kit does is decide on what should be deemed causal and what should not in the statistical record. The death certificate remains as it is, being a legal document, but the data extracted may change in accordance with changes in coding rules.

MUSE is not the only game played and I would recommend interested folk chase up my many posts illuminating death or browse through the link below (searching for the phrase 'rule 3' would be a good place to start). Here's what the WHO have to say about coding death...

With reference to section 4.2.3 of volume 2 of ICD-10, the purpose of mortality classification (coding) is to produce the most useful cause of death statistics possible. Thus, whether a sequence is listed as 'rejected' or 'accepted' may reflect interests of importance for public health rather than what is acceptable from a purely medical point of view. Therefore, always apply these instructions, whether they can be considered medically correct or not.

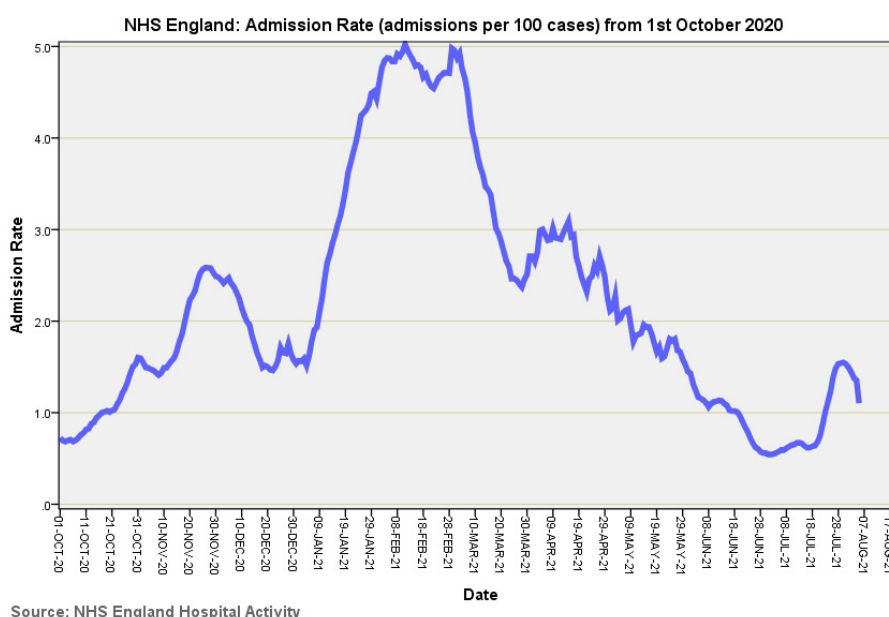
<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/methodologies/userguidetomortalitystatisticsjuly2017#background-and-history-of-mortality-data>



## Admission Rate Update

This morning's update slide is one of my favourite rates to track when I'm not getting data depression brought about by realisation of the futility of analysing government COVID statistics. A case isn't necessarily a case and an admission isn't necessarily an admission, as we have discovered from my recent posts. At some level there will be cases and admissions but we just don't know what that level is. What I like about this rate, and what gives me data hope, is that dividing PCR-inflated admission counts by PCR-inflated case counts algebraically means PCR-inflation is cancelled out (not entirely and not exactly but sufficient to stop me frowning). We may therefore be looking at a little nugget of truth.

To track this rate without all the quirks and bumps caused by daily administrative delays I've reached for rolling 7-day counts of both admissions and cases to smooth matters out, otherwise we're looking at a chart that resembles a frightened hedgehog. What is most curious is the relatively quiet period for most of December, with 9<sup>th</sup> January onward bursting in on the scene. April did something a little unusual but the award for the most unusual peak surely goes to late July. This is the weirdest virus in town.



## 3<sup>rd</sup> September 2021

### Using EuroMOMO

EuroMOMO is a European mortality monitoring activity, aiming to detect and measure excess deaths related to seasonal influenza, pandemics and other public health threats. Official national mortality statistics are provided weekly from the 29 European countries or subnational regions in the EuroMOMO collaborative network, supported by the European Centre for Disease Prevention and Control (ECDC) and the World Health Organization (WHO), and hosted by Statens Serum Institut, Denmark.

Whilst this is a useful online resource caution is needed in interpretation of the data. A keen group member in a thread below has pulled up the EuroMOMO chart for 15 – 44y deaths for England and has noticed some worrying humps (slide #1). They sure look worrying at first glance but the first question we should ask is are those humps unique or within the range of expectation? Judging by the pale blue normal range band and having the humps stick above the dashed red substantial increase line sure hammer the worry home but what are these thresholds telling us?

Well, they are based on analysis of the data going back to week 36 of 2016. This isn't very far back in epidemiological circles, being just under 5 years during a period when we enjoyed 3 unusually quiet flu seasons. This means we are going to make some very conservative estimates of what constitutes 'normal range'. What we ideally need are ranges based on 10 or 20 years' worth of historic data. It just so happens I have mortality data going back to week 1 of 2010, so let us get the kettle on, open the biscuits and compare and contrast...

In slide #2 you'll see a similar data series for 15-44y deaths but with two notable differences. The first is I've standardised raw counts with respect to the 2015 population to avoid bias due to an expanding population. This tilts the series only very slightly but ensures we are making an equitable comparison over time. Second is that this series is for England & Wales combined – I don't have data for England and Wales separately to hand. I've converted the series to Z-scores and added blue dashed lines to mark the normal range band and a red dashed line to mark the substantial increase threshold.

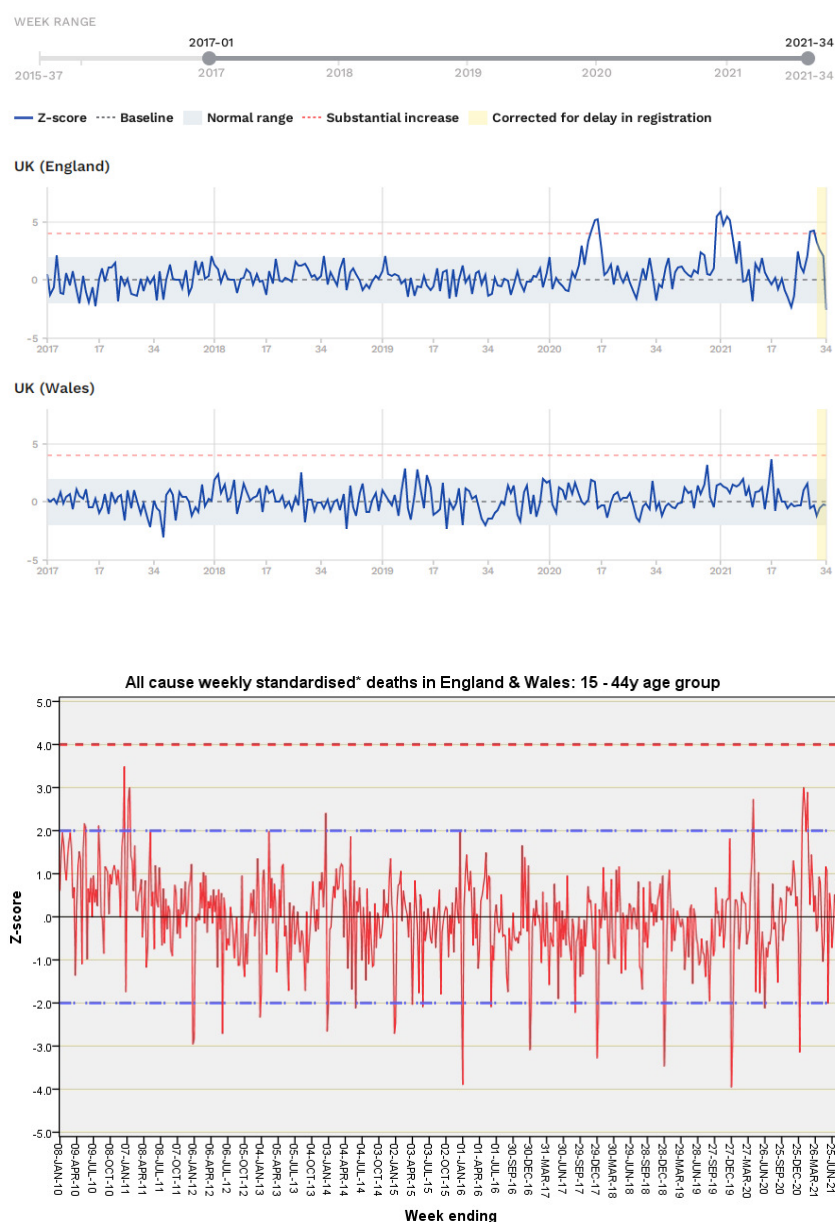
We now observe the series sitting within the normal range but just poking out in a few places. At no point does the data series poke above the red substantial increased threshold but if it did it would be back in January of 2011. We have no idea of what was going on prior to 2010 but my money is on even greater historic extremes. Our conclusion now turns completely on its head from “OMG!” to “Not A Lot!” By relying on short series data the EuroMOMO crew can lead us into erroneous assessment.

But we can go one better than Z-score thresholds; we can use Autoregressive Integrated Moving Average (ARIMA) time series modelling to dig deep into the matter. We can run an ARIMA model over the data and ask if any weeks stand out as being significant. In this regard only week 576 popped out as troubling with an estimated transient excess of +103.5 weekly deaths ( $p < 0.001$ ). This corresponds to w/e 15th January 2021. In slide #3 you can see the results of this model with a green dashed line marking the worrying week. Something happened back then, but what?

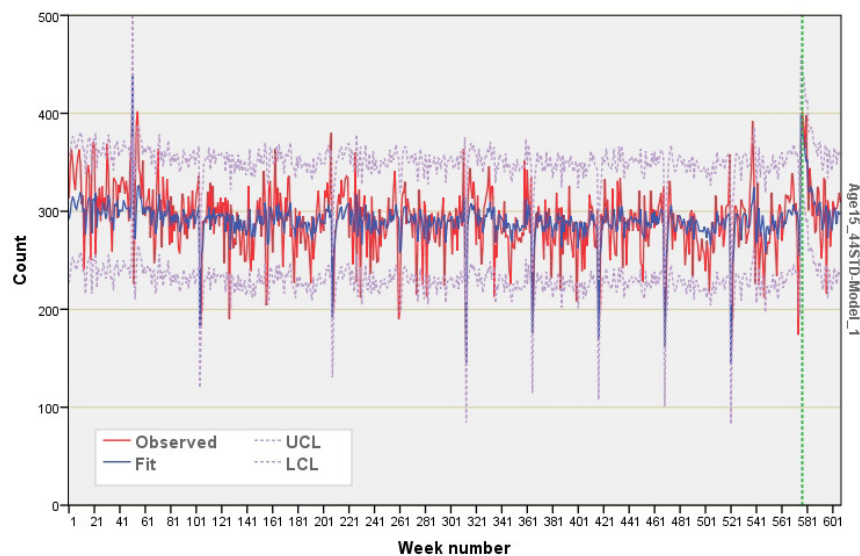
Well, all this is only half of the EuroMOMO story. Take a look at all those spikes that stick out below in slide #2 and #3. These sudden and dramatic drops in the death tally are not real, they are simply an artefact of registration offices closing over the festive holidays. These sharp spikes are followed by little bumps as registration office staff catch up on death certificates when they get back to work. Yes indeed folks, we are looking at deaths by registration date and not by occurrence date! By the same token any positive spikes we see are not necessarily real.

So what happened to those negative spikes in the EuroMOMO data? They smoothed them out (and probably say so in the small print). By smoothing the data you reduce the 'noise' and will therefore reduce the range of normality, thereby pushing any humps into significance. Welcome to EuroMOMO. This is data, Jim, but not as we know it.

<https://www.euromomo.eu/>



Source: Office for National Statistics; data period w/e 8th Jan 2010 - w/e/ 20th Aug 2021; \*wrt 2015 population



Source: Office for National Statistics

### Using EuroMOMO (adults)

We've just been looking at 15 – 44y deaths in England & Wales, so whilst my tea is still brewing I thought you'd all like to see the same treatment given to adult deaths. When I say 'adult' I mean anybody aged 15y and older since this threshold is defined by the Office for National Statistics; ideally I'd analyse 18y+ but there you go!

Here is the time series for registered deaths given the EuroMOMO Z-score make-over with blue lines for the 'normal' range and red line for substantial increase. The pandemic rears its ugly head in two well-defined periods. Worthy of note is the winter of 2014/15 spike that comes in third place, but we have no idea what we'd see if we could extend the series back to 2000.

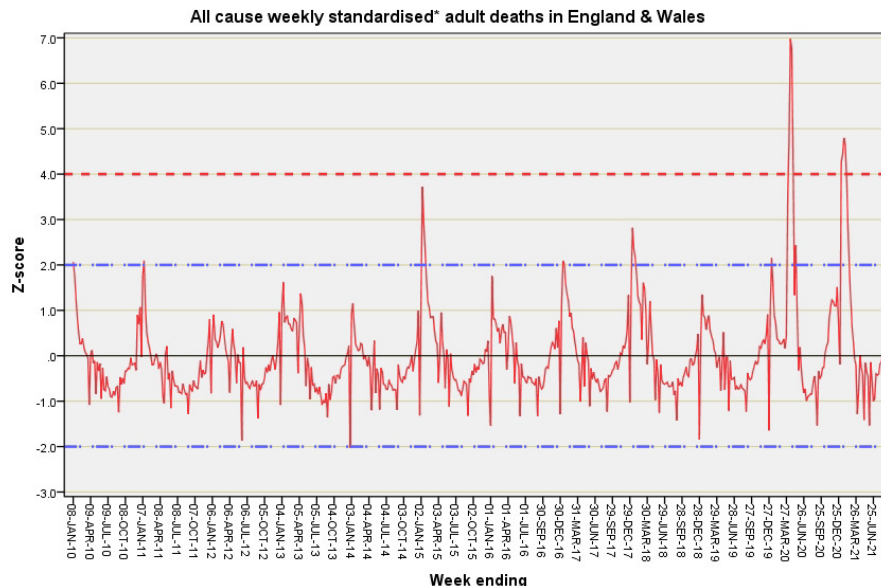
We must remember that these deaths are by registration date and not by death date so spikes can be enhanced simply because of processing delays. In this regard those interested may like to look at earlier analyses in my collated posts PDF (link in Read Me pinned post) where I unearth a substantial and inexplicable discrepancy in death registration amounting to 2k – 3k deaths that went unprocessed to hit the registration figures many weeks later.

We must also note that registration delay is of the order of weeks and can sometimes be months, so counts for the period April – August 2021 are almost certainly going to be lower than they will eventually be. To assume the recent dip is entirely due to immunity or vaccine benefit by using the registered death count is fallacious at this stage, though this won't stop the authorities declaring outrageous success. Understanding death requires patience.

In terms of ARIMA modelling identifying weeks of concern there is an estimated transient excess of +6,056 for week 535 – w/e 4th April 2021 ( $p < 0.001$ ), and an estimated transient of +7451 for week 575 – w/e 8th January 2021 ( $p < 0.001$ ). Please note use of the word transient - this is a most peculiar feature for a novel virus creating all manner of deadly variant. What is interesting here is identification of a negative additive excess of -3,581 for week 540 – w/e 8th May 2020 ( $p < 0.001$ ) - another peculiarity!

BTW if anybody is interested in understanding how that first big spike came about please take a look at my work on care home deaths (link to collated posts PDF is in the Read Me pinned post).





Source: Office for National Statistics; data period w/e 8th Jan 2010 - w/e 20th Aug 2021; \*wrt 2015 population

**4<sup>th</sup> September**

## ***In Through The Out Door***

My post of 2nd September entitled Admission Rate Update revealed that what the government stats folk are calling a COVID admission isn't what you or I would call a COVID admission; that is, somebody sick with COVID symptoms and testing positive at a low cycle threshold being admitted to hospital via the Emergency Department. We discovered that admissions figures include all re-admissions as well as inpatients testing positive and admissions to units that do not treat COVID. At this point Dr Evil would raise his fingers thus.

After analysing +150k admissions to emergency departments in several UK hospitals there's another curve ball I'd like to throw and that is outcome of admission. That is, do people get transferred to ICU/HDU, a ward, transferred to somewhere else for treatment or are they simply discharged home the same day? We can extend the question a little and ask how destination outcome for COVID cases compares with non-COVID cases. Naturally, we're all going to assume that COVID cases coming in through the ED front door and counting toward those admission figures are going to be quite serious cases and will end up with hospitalisation.

I have to tell you now that this assumption doesn't hold that much water. Ideally I'd reveal all but for time being this work must remain under wraps for several reasons. My recommendation is to keep questioning everything, and I mean everything!

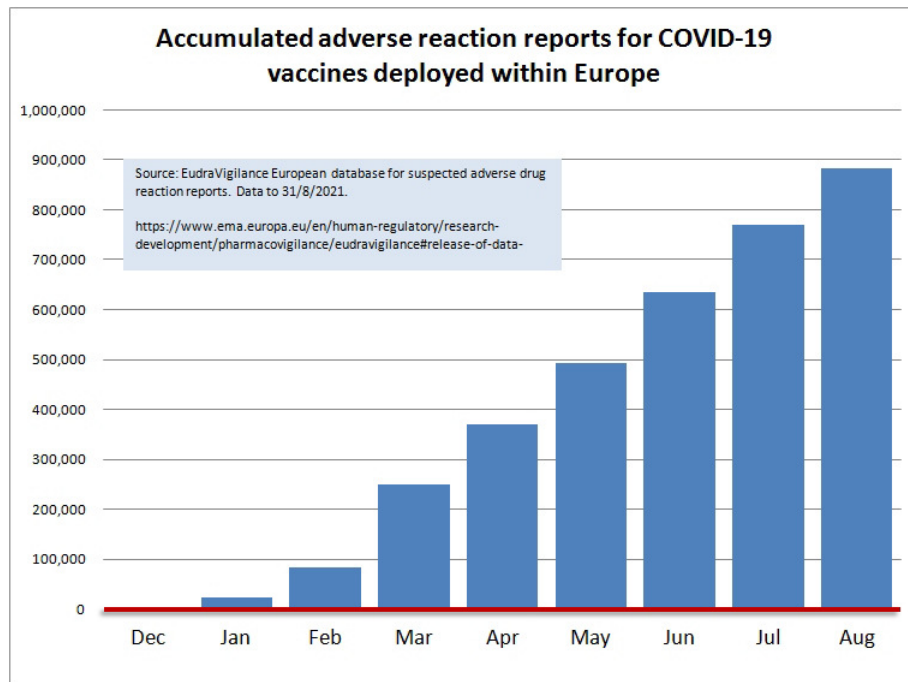
## ***EudraVigilance Monthly Update***

As you study these figures it is worth noting that they are by no means comprehensive, with audits suggesting 1% - 10% data capture at best. I have received several personal communications indicating vaccinated folk are reluctant to acknowledge symptoms let alone report them, and there is concern amongst colleagues that the medical profession is dragging its feet. Both of these behaviours endanger the very alarm system put in place to ensure public safety.

As at 4<sup>th</sup> September 2021 EudraVigilance reports 23,932 deaths among 901,534 individuals who have reported adverse reactions post-vaccination. Accumulated monthly counts continue to rise at a linear rate estimated at 120,256 reports per month ( $p < 0.001$ ; 95% confidence interval = 110,771; 129,740).

The European Centre for Disease Control (ECDC) reports 281,797,522 vaccinated individuals for the same period, thus returning an adverse incident report rate of 0.320% ( $901,534/281,797,522$ ) and a fatal report rate of 0.008% ( $23,932/281,797,522$ ) for all four biological products. A total of 2,252,685 adverse reactions were suffered by the 901,534 individuals concerned, indicating an average of 2.50 post-vaccination events per case. Of these 1,105,211 (49.1%) were categorised as serious, with 1,147,474 (50.9%) categorised as non-serious. Breakdowns for these top line figures may be found in the attached charts.

| As at 4th Sep 2021 | Total Adverse Reports | Total deaths | Adverse report fatality rate | People receiving vaccine | Post-vaccination adverse report rate | Post-vaccination death rate |
|--------------------|-----------------------|--------------|------------------------------|--------------------------|--------------------------------------|-----------------------------|
| Moderna            | 107,060               | 6,242        | 5.8%                         | 34,365,298               | 0.312%                               | 0.018%                      |
| Pfizer             | 401,500               | 11,478       | 2.9%                         | 196,746,377              | 0.204%                               | 0.006%                      |
| AstraZeneca        | 367,124               | 5,108        | 1.4%                         | 41,053,377               | 0.894%                               | 0.012%                      |
| Janssen            | 25,850                | 1,104        | 4.3%                         | 9,632,469                | 0.268%                               | 0.011%                      |
| Total              | 901,534               | 23,932       | 2.7%                         | 281,797,522              | 0.320%                               | 0.008%                      |



#### Fatal Reactions Following COVID-19 Vaccination by Product

| As at 4th Sep 2021                | Accumulated Raw Counts |        |             |         |        |
|-----------------------------------|------------------------|--------|-------------|---------|--------|
|                                   | Moderna                | Pfizer | AstraZeneca | Janssen | Total  |
| Blood & lymphatic system          | 57                     | 153    | 214         | 28      | 452    |
| Cardiac                           | 667                    | 1,717  | 594         | 115     | 3,093  |
| Congenital                        | 2                      | 20     | 4           | 0       | 26     |
| Ear & labyrinth                   | 1                      | 8      | 0           | 0       | 9      |
| Endocrine                         | 2                      | 5      | 4           | 1       | 12     |
| Eye                               | 18                     | 28     | 21          | 5       | 72     |
| Gastrointestinal                  | 236                    | 480    | 259         | 53      | 1,028  |
| General & administration site     | 2,421                  | 3,250  | 1,242       | 281     | 7,194  |
| Hepatobiliary                     | 24                     | 54     | 51          | 9       | 138    |
| Immune system                     | 11                     | 64     | 22          | 7       | 104    |
| Infections & infestations         | 407                    | 1,123  | 322         | 55      | 1,907  |
| Injury, poisoning & complication  | 118                    | 175    | 139         | 13      | 445    |
| Medical Investigations            | 119                    | 357    | 115         | 67      | 658    |
| Metabolism & nutritional          | 144                    | 204    | 70          | 24      | 442    |
| Musculoskeletal                   | 127                    | 144    | 70          | 28      | 369    |
| Neoplasms                         | 37                     | 66     | 16          | 2       | 121    |
| Nervous system                    | 635                    | 1,255  | 816         | 131     | 2,837  |
| Pregnancy, puerperium & perinatal | 6                      | 35     | 9           | 1       | 51     |
| Product issues                    | 0                      | 1      | 1           | 0       | 2      |
| Psychiatric                       | 110                    | 153    | 45          | 11      | 319    |
| Renal & urinary                   | 107                    | 194    | 48          | 10      | 359    |
| Reproductive & breast             | 3                      | 3      | 1           | 4       | 11     |
| Respiratory & thoracic            | 599                    | 1,355  | 612         | 117     | 2,683  |
| Skin & subcutaneous tissue        | 56                     | 101    | 37          | 4       | 198    |
| Social circumstances              | 25                     | 13     | 6           | 3       | 47     |
| Surgical & medical procedures     | 69                     | 31     | 21          | 36      | 157    |
| Vascular                          | 241                    | 489    | 369         | 99      | 1,198  |
| Total                             | 6,242                  | 11,478 | 5,108       | 1,104   | 23,932 |

Source: EudraVigilance European database for suspected adverse drug reaction reports  
<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

### Serious Reactions Following COVID-19 Vaccination by Product

| Accumulated Raw Counts            |         |         |             |         |           |
|-----------------------------------|---------|---------|-------------|---------|-----------|
| As at 4th Sep 2021                | Moderna | Pfizer  | AstraZeneca | Janssen | Total     |
| Blood & lymphatic system          | 2,278   | 9,255   | 7,886       | 419     | 19,838    |
| Cardiac                           | 6,843   | 18,944  | 10,746      | 842     | 37,375    |
| Congenital                        | 106     | 215     | 0           | 25      | 346       |
| Ear & labyrinth                   | 2,403   | 6,597   | 7,545       | 247     | 16,792    |
| Endocrine                         | 186     | 551     | 388         | 30      | 1,155     |
| Eye                               | 3,195   | 8,904   | 11,332      | 525     | 23,956    |
| Gastrointestinal                  | 10,994  | 33,180  | 53,517      | 1,486   | 99,177    |
| General & administration site     | 27,496  | 80,815  | 118,550     | 4,609   | 231,470   |
| Hepatobiliary                     | 418     | 928     | 721         | 85      | 2,152     |
| Immune system                     | 2,025   | 8,644   | 3,178       | 254     | 14,101    |
| Infections & infestations         | 6,233   | 21,116  | 15,709      | 1,214   | 44,272    |
| Injury, poisoning & complication  | 4,813   | 9,756   | 6,597       | 509     | 21,675    |
| Medical Investigations            | 2,850   | 14,240  | 10,834      | 2,442   | 30,366    |
| Metabolism & nutritional          | 2,101   | 4,655   | 7,938       | 260     | 14,954    |
| Musculoskeletal                   | 11,981  | 37,501  | 64,881      | 2,091   | 116,454   |
| Neoplasms                         | 307     | 682     | 395         | 0       | 1,384     |
| Nervous system                    | 25,176  | 68,670  | 108,540     | 4,082   | 206,468   |
| Pregnancy, puerperium & perinatal | 511     | 1,098   | 0           | 0       | 1,609     |
| Product issues                    | 0       | 0       | 0           | 0       | 0         |
| Psychiatric                       | 4,214   | 10,460  | 12,881      | 526     | 28,081    |
| Renal & urinary                   | 1,410   | 4,242   | 2,459       | 210     | 8,321     |
| Reproductive & breast             | 1,593   | 8,322   | 6,881       | 179     | 16,975    |
| Respiratory & thoracic            | 9,215   | 27,498  | 23,601      | 1,609   | 61,923    |
| Skin & subcutaneous tissue        | 7,861   | 22,270  | 27,684      | 807     | 58,622    |
| Social circumstances              | 1,090   | 1,441   | 821         | 163     | 3,515     |
| Surgical & medical procedures     | 812     | 533     | 819         | 529     | 2,693     |
| Vascular                          | 5,778   | 17,610  | 16,199      | 1,950   | 41,537    |
| Total                             | 141,889 | 418,127 | 520,102     | 25,093  | 1,105,211 |
| Serious to non-serious ratio      | 1.12    | 0.80    | 1.15        | 0.53    | 0.96      |

Source: EudraVigilance European database for suspected adverse drug reaction reports

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

### Non Serious Reactions Following COVID-19 Vaccination by Product

| Accumulated Raw Counts            |         |         |             |         |           |
|-----------------------------------|---------|---------|-------------|---------|-----------|
| As at 4th Sep 2021                | Moderna | Pfizer  | AstraZeneca | Janssen | Total     |
| Blood & lymphatic system          | 2,963   | 16,377  | 3,824       | 252     | 23,416    |
| Cardiac                           | 1,135   | 6,802   | 5,706       | 328     | 13,971    |
| Congenital                        | 5       | 29      | 21          | 0       | 55        |
| Ear & labyrinth                   | 942     | 5,901   | 3,881       | 266     | 10,990    |
| Endocrine                         | 28      | 132     | 108         | 10      | 278       |
| Eye                               | 977     | 5,837   | 5,849       | 455     | 13,118    |
| Gastrointestinal                  | 12,391  | 50,029  | 42,054      | 5,149   | 109,623   |
| General & administration site     | 44,701  | 164,178 | 137,418     | 14,333  | 360,630   |
| Hepatobiliary                     | 21      | 135     | 100         | 7       | 263       |
| Immune system                     | 337     | 1,414   | 766         | 41      | 2,558     |
| Infections & infestations         | 1,879   | 10,589  | 8,669       | 377     | 21,514    |
| Injury, poisoning & complication  | 1,005   | 2,425   | 4,474       | 169     | 8,073     |
| Medical Investigations            | 2,371   | 9,378   | 10,565      | 1,324   | 23,638    |
| Metabolism & nutritional          | 512     | 2,297   | 3,621       | 157     | 6,587     |
| Musculoskeletal                   | 21,800  | 86,405  | 82,324      | 9,438   | 199,967   |
| Neoplasms                         | 13      | 54      | 108         | 1       | 176       |
| Nervous system                    | 22,173  | 96,652  | 94,491      | 10,947  | 224,263   |
| Pregnancy, puerperium & perinatal | 12      | 59      | 57          | 2       | 130       |
| Product issues                    | 22      | 80      | 43          | 6       | 151       |
| Psychiatric                       | 945     | 6,485   | 5,490       | 431     | 13,351    |
| Renal & urinary                   | 173     | 779     | 1,138       | 63      | 2,153     |
| Reproductive & breast             | 1,548   | 8,395   | 5,981       | 576     | 16,500    |
| Respiratory & thoracic            | 2,498   | 14,293  | 10,628      | 935     | 28,354    |
| Skin & subcutaneous tissue        | 6,703   | 23,144  | 17,144      | 1,421   | 48,412    |
| Social circumstances              | 61      | 267     | 446         | 42      | 816       |
| Surgical & medical procedures     | 60      | 301     | 293         | 5       | 659       |
| Vascular                          | 1,381   | 8,431   | 7,627       | 389     | 17,828    |
| Total                             | 126,656 | 520,868 | 452,826     | 47,124  | 1,147,474 |

Source: EudraVigilance European database for suspected adverse drug reaction reports

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

## A Short Note On Case Probability

One thing I'm coming across are hospital administrators (and some clinical staff) claiming that their department is full of unvaccinated young folk. I completely believe them because it's a question of probability: we should expect to see a lot of unvaccinated young folk in the emergency department!

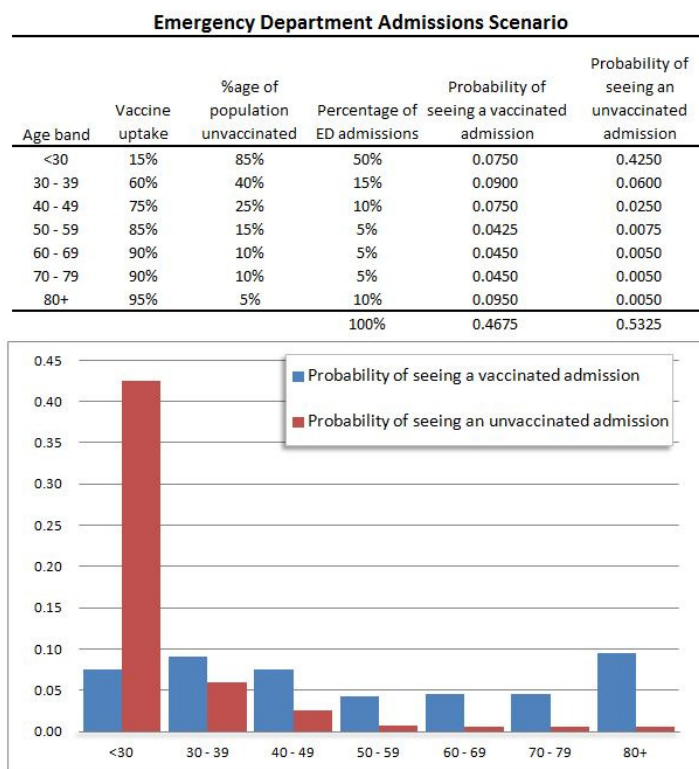
Emergency medicine is dominated by the young and the young have either rejected the vaccines or haven't decided what to do as yet, ergo we should expect to see greater numbers of unvaccinated young ending up in A&E. Whilst I'm not able to reveal figures I have from an actual ED what I can do is offer a scenario to illustrate the situation.

In the composite slide below I've dived people into 7 age bands, and against each age band I've jotted down a nominal rate for vaccine uptake, starting at 15% for the <30y and ending at 95% for the 80+y. In the second column I've calculated the percentage of that age band that remains unvaccinated. In the third column I provide a nominal breakdown of ED attendance by age band, starting with a hefty 50% of admissions for all those under 30. This will vary according to catchment area, base population and service provision (secondary or tertiary service provider).

What we have to do now is calculate the probability of seeing either vaccinated or unvaccinated folk by age band, this simply being the first or second column multiplied by the all important third column. Hence for vaccinated <30y we have  $15\% \times 50\% = 7.5\%$  (aka 0.075 in probability-speak), and for the unvaccinated <30y we have  $85\% \times 50\% = 42.5\%$  (aka 0.4250 in probability-speak). Those numbers in the fourth and fifth column reveal the likelihood of bumping into different types of folk if we donned a stethoscope and walked into an emergency room, a value of 1.000 meaning it is 100% likely.

For those not keen on numbers I've plotted these probabilities as a graphic so it all hangs together. That big red spike are those unvaccinated young things administrators are talking about, the spike being a function of the laws of probability regardless of what COVID may or may not be doing. We can now compare probabilities such that I'd expect to see  $0.4250 / 0.0425 = 10$  times more unvaccinated <30y youngsters than vaccinated 50 – 59y mature types (all things being equal). All this is basic probability and nothing more.

What we can go on to do if we are sitting on 331k ED admissions records is check to see whether any spikes in cases are greater or lesser than expected or just about fine and dandy. We can also check whether any anomalies are part of a trend or just one of those things that happen from time to time. Until this kind of detailed analysis is undertaken then hospital administrators (and some clinical staff) are relying on opinion; it will be misleading opinion at that: know thy laws of probability!



### ***NHSUK: Overview of COVID admissions***

Between 1st January and 13th June 2021 a total of 161,494 admissions were recorded for the emergency departments of a sizeable UK NHS Trust. Of these 2,102 (1.3%) were designated as COVID cases. Analysis of diagnostic field information revealed 337 cases had no supporting clinical evidence of COVID other than a positive PCR test, with only 204 cases presenting with a relevant chief complaint (e.g. shortness of breath) supported by a respiratory diagnosis. Only 9 cases presented with a relevant chief complaint a respiratory diagnosis and a further supporting diagnosis indicative of SARS-COV-2 infection.

Out of the 2,102 declared COVID cases only 204 (9.7%) could be deemed partially or fully symptomatic from a medical perspective with just 9 (0.4%) being deemed fully symptomatic of SARS-COV-2 infection. Thus, out of the total of 161,494 admissions for this period, partially or fully symptomatic COVID cases accounted for just 0.13% of total intake with fully symptomatic COVID accounting for 0.006% of emergency department intake. In terms of very young COVID (under 21y) we find 188/161,494 (0.12%) admissions of which 17/188 were symptomatic (9.0%).

The discharge destination was recorded for 2,022 of the 2,102 COVID emergency admissions and a tabulation of destination by COVID status is provided for these. We thus see that 691/1,822 (37.9%) of asymptomatic cases were discharged back home the same day with 58/200 (29.0%) of symptomatic cases discharged back home the same day. If we sum all same day discharges back to a place of residence (with or without ambulatory assistance) we find 712/1,822 (39.1%) asymptomatic COVID cases and 60/200 (30.0%) for symptomatic cases falling into this category.

In terms of high dependency medicine (ICU/HDU/CCU) we find 88/1,822 (4.8%) asymptomatic and 5/200 (2.5%) symptomatic COVID cases requiring urgent treatment. In relation to these figures please bear in mind that asymptomatic means no respiratory diagnosis. To put high dependency medicine for symptomatic COVID cases into full clinical perspective we find 5/151,076 (0.003%) of emergency department admissions over the period requiring this level of care.

Only 1/200 symptomatic COVID cases died in the emergency department resulting in discharge to the mortuary, this representing a 0.5% departmental mortality rate for symptomatic cases. In comparison 7/1,822 asymptomatic cases died in the department, this representing 0.4% departmental mortality.

#### **Discharge Destination \* COVID status Crosstabulation**

| Count                 |                                    | COVID status |             |       |
|-----------------------|------------------------------------|--------------|-------------|-------|
|                       |                                    | Asymptomatic | Symptomatic | Total |
| Discharge Destination | ED discharge to CCU                | 1            | 0           | 1     |
|                       | ED discharge to ICU                | 74           | 3           | 77    |
|                       | Admission to the mortuary          | 7            | 1           | 8     |
|                       | Discharge home                     | 691          | 58          | 749   |
|                       | Discharge to nursing home          | 3            | 0           | 3     |
|                       | Discharge to residential home      | 5            | 0           | 5     |
|                       | Discharge to ward                  | 947          | 128         | 1075  |
|                       | ED discharge to ambulatory ECS     | 13           | 2           | 15    |
|                       | ED discharge to ED short stay ward | 4            | 0           | 4     |
|                       | ED discharge to HDU                | 13           | 2           | 15    |
|                       | Patient transfer to other facility | 64           | 6           | 70    |
|                       | Total                              | 1822         | 200         | 2022  |

### ***NHSUK: Overview of COVID deaths***

Between 1st March 2020 and 15th June 2021 a total of 16,805 in hospital deaths were recorded for a sizeable UK NHS Trust. Of these 3,228 (19.2%) were designated as COVID deaths. Analysis of diagnostic field information revealed 1,746/3,228 (54.1%) COVID designated deaths had no supporting clinical evidence of COVID other than a positive PCR test, with 1,416/3,228 (43.9%) deaths supported by a single respiratory diagnosis. Only 66/3,228 (2.0%) COVID deaths were supported by a respiratory diagnosis and further supporting diagnoses indicative of SARS-COV-2 infection.

Hypoxia and respiratory failure are hallmarks of SARS-COV-2 infection leading to death yet in the sample of 3,228 COVID-19 designated deaths incidence of hypoxia was not recorded in any of the diagnostic fields. A total of 182/16,805 deaths involving respiratory failure were noted for



the period (1.1%), and of these 15/182 were associated with symptomatic COVID (8.2%). Respiratory failure during the pandemic period to mid-June was therefore primarily a feature of non-COVID admissions (91.8% of deaths involving respiratory failure).

A breakdown of the 16,805 deaths by age band and COVID diagnostic status is provided in which we observe asymptomatic COVID death as a feature for the oldest age group of 80+y, with symptomatic COVID death being a feature of the 60 - 69y age group.

In terms of young death (under 21 years) we find 122/16,805 (0.73%), with 121/122 (99.2%) not being attributed to COVID. The single young COVID death was an asymptomatic case. Thus, among 16,805 in-hospital deaths registered over the period 1st March 2020 - 15th June 2021 not a single symptomatic COVID death occurred in a person under the age of 21y.

**Age band \* COVID status Crosstabulation**

|          |               |                  | COVID status |              |             |        |
|----------|---------------|------------------|--------------|--------------|-------------|--------|
|          |               |                  | Not COVID    | Asymptomatic | Symptomatic | Total  |
| Age band | <30 years     | Count            | 173          | 3            | 4           | 180    |
|          |               | % within Ageband | 96.1%        | 1.7%         | 2.2%        | 100.0% |
|          | 30 - 39 years | Count            | 140          | 3            | 9           | 152    |
|          |               | % within Ageband | 92.1%        | 2.0%         | 5.9%        | 100.0% |
|          | 40 - 49 years | Count            | 345          | 24           | 25          | 394    |
|          |               | % within Ageband | 87.6%        | 6.1%         | 6.3%        | 100.0% |
|          | 50 - 59 years | Count            | 820          | 76           | 76          | 972    |
|          |               | % within Ageband | 84.4%        | 7.8%         | 7.8%        | 100.0% |
|          | 60 - 69 years | Count            | 1621         | 133          | 188         | 1942   |
|          |               | % within Ageband | 83.5%        | 6.8%         | 9.7%        | 100.0% |
|          | 70 - 79 years | Count            | 3261         | 351          | 369         | 3981   |
|          |               | % within Ageband | 81.9%        | 8.8%         | 9.3%        | 100.0% |
|          | 80+ years     | Count            | 7217         | 1156         | 811         | 9184   |
|          |               | % within Ageband | 78.6%        | 12.6%        | 8.8%        | 100.0% |
|          | Total         | Count            | 13577        | 1746         | 1482        | 16805  |
|          |               | % within Ageband | 80.8%        | 10.4%        | 8.8%        | 100.0% |

## ***NHSUK: Report 11 – Audit of ED COVID-19 Coding***

I am hoping group members have found the first two summary posts in the NHSUK series useful. They tell a story of inappropriate coding of emergency department admissions and deaths driven by zealous use of tests that are primarily useful as a means of supporting clinical diagnoses; instead they seem to have replaced sound clinical judgement. I attach the first report to be released to the public that provides some background to this issue.

Some may find it odd to start with report 11 in the series but inappropriate coding of cases really is the heart of the matter. If COVID cases had been coded and analysed diligently from the outset we wouldn't have experienced a pandemic, lockdown, masks and all the rest; instead, our healthcare systems would have quietly and professionally dealt with the situation.

I wrote report 11 because things were simply not adding up. In a nutshell COVID wasn't acting like the terribly deadly plague it has been billed to be, and all features I was expecting like a surge in respiratory failure, hypoxia and disseminated intravascular coagulation simply weren't showing up in analysis. Certainly have been plenty of cases that were rather unpleasant for ICU staff but the clinical population, as a whole, when viewed through a statistical lens didn't reflect this. After 10 reports and a fair bit of mumbling I decided to take a good look at the clinical coding and wasn't exactly happy with what I found. I recommend you download the PDF in case facebook take umbrage with dissemination of factual information. Evidence-based medicine must start with sound evidence!



### NHSUK: Admission outcomes for under 21y

Yesterday I revealed some results from my study of 161,494 admissions to the emergency departments of a sizeable UK NHS Authority for the period 1st January - 13th June 2021. I mentioned that in terms of young COVID (u21y) we find 188/161,494 (0.12%) admissions of which 17/188 were symptomatic (9.0%). This morning we are going to take a look at where those 188 u21y ended up, and I shall set COVID in context of all u21y admissions. This analysis excludes all DOA since I'm looking at care outcomes.

In the first table we discover that just one asymptomatic case among the 188 was admitted to intensive care, this representing 0.5% of all u21y COVID cases, with 99/188 (52.7%) of u21y COVID cases being discharged back home. Unfortunately we don't know the outcome for 37 COVID cases so I shall express these numbers again in terms of known outcomes, where we find 1/151 (0.7%) being admitted to intensive care and 99/151 (65.6%) being sent home.

There appears to be an unequal and rather surprising split between known outcomes for asymptomatic and symptomatic COVID such that 86/135 (63.7%) of asymptomatic cases were discharged back home whereas 13/16 (81.3%) of symptomatic cases were discharged thus, though this difference is not statistically significant (comparison of proportions Chi-square = 1.95, 1df, p=0.163).

In terms of the bigger picture outcomes were known for 35,919 u21y admissions of which 151 were COVID cases (0.4%). For the second table I have grouped admission destinations into high and low dependency care, 'high' including all intensive and high dependency care units and 'low' including discharge to a ward or outpatient clinic. Home/Ambulatory refers to those cases who were discharged home via the ambulance service (largely due to mobility issues) and Home/Other includes discharge to police custody - a feature of clinical life for a busy emergency department. We may note zero COVID deaths and just 11 u21y non-COVID deaths.

There will be some people who will jump straight in and declare 0.7% (1/151) of COVID cases required high dependency care whilst only 0.1% (52/35,757) of non-COVID cases required such. Broad comparisons like these are clinically meaningless, a better comparison being COVID cases against influenza or respiratory cases otherwise we end up comparing a complex respiratory disease with dialysis, alcoholic intoxication, substance abuse, knife wounds and such. Please be wary of this pitfall whenever you study official figures!

#### Discharge Destination \* COVID status Crosstabulation

Count

|                       |                                    | COVID status |             | Total |
|-----------------------|------------------------------------|--------------|-------------|-------|
|                       |                                    | Asymptomatic | Symptomatic |       |
| Discharge Destination | ED discharge to ICU                | 1            | 0           | 1     |
|                       | Discharge home                     | 86           | 13          | 99    |
|                       | Discharge to ward                  | 8            | 1           | 9     |
|                       | Patient transfer to other facility | 40           | 2           | 42    |
|                       | Unknown                            | 36           | 1           | 37    |
| Total                 |                                    | 171          | 17          | 188   |

#### Destination \* Admission COVID Crosstabulation

Count

|             |                 | Admission COVID |          | Total |
|-------------|-----------------|-----------------|----------|-------|
|             |                 | Not COVID       | COVID-19 |       |
| Destination | Mortuary        | 11              | 0        | 11    |
|             | High dependency | 52              | 1        | 53    |
|             | Low dependency  | 3247            | 9        | 3256  |
|             | Transferred     | 505             | 42       | 547   |
|             | Home/Ambulatory | 1171            | 0        | 1171  |
|             | Home/Other      | 30782           | 99       | 30881 |
| Total       |                 | 35768           | 151      | 35919 |

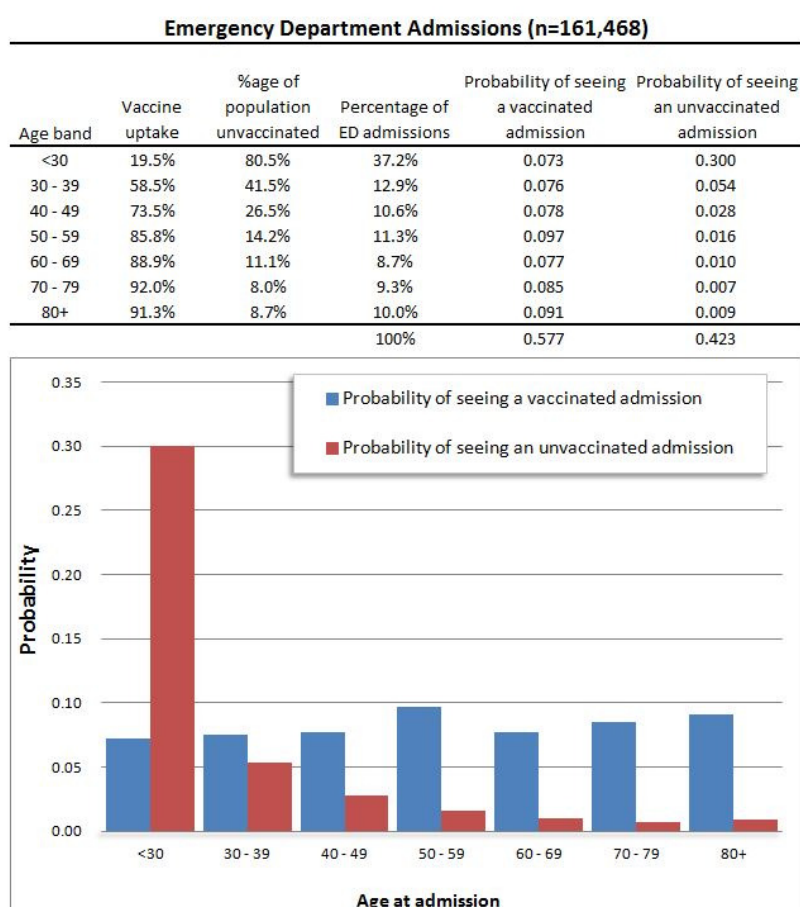
### NHSUK: ED Admissions Observation Bias

In a post entitled *A Short Note On Case Probability* that was penned on 11<sup>th</sup> September I offered a theoretical scenario to help folk understand why it is perfectly natural for younger unvaccinated folk to be filling emergency departments, this being an outcome of the Laws of Probability rather than anything the virus or vaccines may or may not be doing.

In my original post I offered a scenario with tabulation of theoretical data and a slide and so today I shall repeat my offering with real data based on my study of 161,494 admissions to the emergency departments of a sizeable UK NHS Authority for the period 1st January - 13th June 2021. Vaccination status was recorded for all 161,494 admissions but age data was missing for 26 cases leaving me with a sample of 161,468 admissions.

In the first column of the table you will discover the vaccination uptake rates by decadal age band for the sample of admissions (you may wish to compare these with official figures). In the third column I give the attendance breakdown by age band of all 161,468 admissions and we can see that 37.2% are for individuals under the age of 30y. As before, the fourth and fifth columns are merely the products of columns one/three and columns two/three expressed as joint probabilities instead of percentages, where a value of 1.000 means 100%. These probabilities are plotted in the graph beneath.

What do these probabilities mean? Well, they indicate the likelihood of you bumping into each of the 14 different categories of patient if you donned a stethoscope, walked into the emergency room and asked "who is next, please?" It should be quite clear from the graph that the patient who is most likely to reply "I'm next" will be an unvaccinated person under 30 years of age. This observation bias has got nothing to do with immunity and disease prevalence; it is simply a function of vaccination uptake and the age profile of ED admissions. Please bear this in mind when you see claims of hospitals being swamped by unvaccinated youngsters. Whether that swamping merely falls in line with expectation or represents a genuine situation of concern is a different matter entirely. To my knowledge official figures are not adjusted for observation bias.



## NHSUK: ED COVID Admissions

In my previous post in this series we discovered that both the age profile and the vaccine uptake profile for ED admissions conspire to produce significant observation bias such that we end up with a department full of young unvaccinated folk regardless of what the virus or vaccine may be doing. Common sense would suggest we are therefore going to see rather more young unvaccinated COVID cases. Instead of guessing I'm going to reveal the actual situation for 161,494 admissions to the emergency departments of a sizeable UK NHS Authority for the period 1st January - 13th June 2021. I shall start by 'proving' that the vaccine is conferring immunity and will reveal how this exciting finding is nothing more than observation bias that is confounding analysis.

In the first slide you'll see how those admissions break down in terms of vaccination status and COVID-19 status on admission. For the time being we'll ignore the wrinkle of symptomatic vs. asymptomatic cases and we'll ignore the wrinkle of first vs. second dose to keep things simple for the purpose of illustration. We'll also just focus on 131,369 adult admissions ( $\geq 18$ y) to ensure equitable group comparison in terms of vaccination.

We observe 1,565/69,476 (2.3%) unvaccinated adult COVID cases and 383/61,893 (0.6%) vaccinated adult COVID cases, this difference being highly statistically significant (comparison of proportions Chi-square=640.6, 1df,  $p < 0.001$ ). Whilst this would appear to be hard evidence of vaccine immunity let me quickly explain the numerical fallacy we have just fallen foul of...

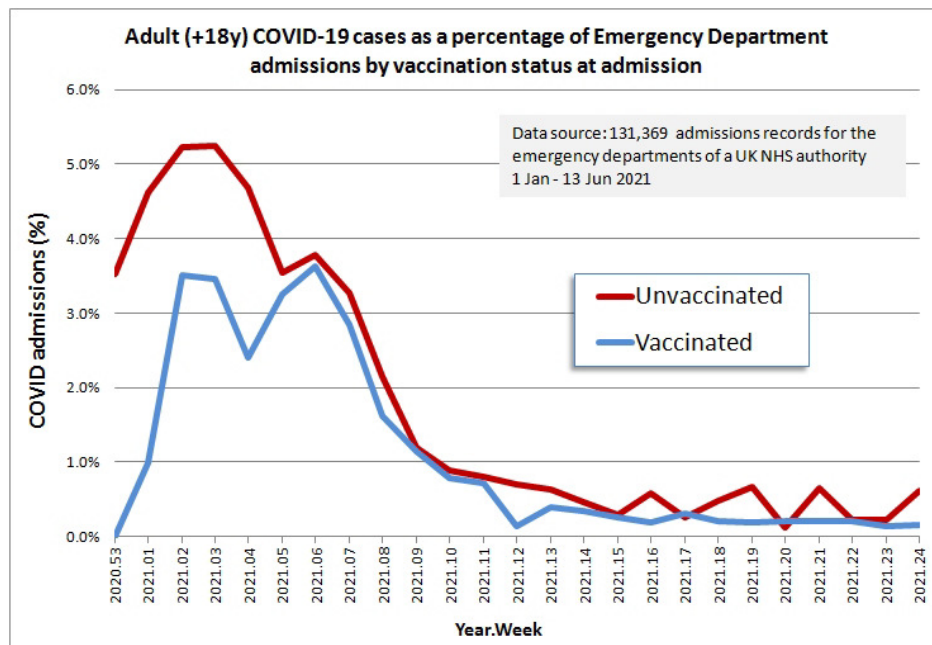
Back in January during the peak of the third wave hospitals were brimming with COVID cases but not many people had been vaccinated and so observation bias would yield lots of unvaccinated COVID cases. During June when the vast majority of people had been vaccinated the pandemic was pretty thin on the ground and so observation bias would yield lots of vaccinated non-COVID cases. Put the two months together and we automatically end up with 'hard evidence' indicating vaccine immunity when this may not necessarily be so – we've compared apples to pears and called them bananas.

To expose this fallacy I've taken those 131,369 adult admissions and turned them into weekly percentages of COVID to all admissions for vaccinated and unvaccinated subgroups (slide #2). There's our January bump that skews the overall figures but look what happens from week 6 onward – both curves descend in unison as disease prevalence declines and we find COVID admission rates flattening out to similar levels. Thus we see that COVID admission rates for vaccinated and unvaccinated adults are actually pretty darn similar when we remove time-dependent observation bias.

It is important to understand how we may conjure numerical evidence of apparent immunity when this may not actually be the case. Either the authorities are grossly incompetent in handling their statistics or they are performing deliberate sleight of hand.

**Vaccination Status \* Admission COVID Crosstabulation**

|                                 |              | COVID Admission Status |               | Total   |
|---------------------------------|--------------|------------------------|---------------|---------|
|                                 |              | Not a COVID case       | COVID-19 case |         |
| Vaccination Status on admission | Unvaccinated | 67,911                 | 1,565         | 69,476  |
|                                 | Vaccinated   | 61,510                 | 383           | 61,893  |
|                                 | Total        | 129,421                | 1,948         | 131,369 |



# John Dee, His Almanac

**1<sup>st</sup> October 2021**

## ***NHS COVID Vaccinations Archive***

I've been slowly working my way through this handy online resource (link below) because I cannot find a breakdown of something as simple as the number of vaccination doses administered by age band by week. However, you can get around this by downloading a bunch of files and ripping figures into a master spreadsheet. This sounds simple except it's not. The layout and format of these sheets changes more times than I have eaten ham and leek pie (and I like ham and leek pie).

Between w/e 27<sup>th</sup> December 2020 and w/e 20<sup>th</sup> June 2021 – a period of 26 weeks – we observe no less than 9 changes of coding and layout. This isn't just a pain in the bottom end for analysts like me, it means that they have obscured just how many younger folk got the jab in the early stages of rollout. By way of example we don't get to see the under 50y figures until w/e 21<sup>st</sup> March 2021 when suddenly we discover 5,410,856 initial doses and 422,678 final doses. Clearly they were jabbing u50y way before that date. Equally we don't get to see the u18y figures until w/e 27<sup>th</sup> June 2021 when 147,293 initial and 59,755 secondary doses magically appear. You couldn't get more cloak and dagger about this if you tried.

I am going to order a batch of flapjack, warm up the big teapot and see what I can do with my box of tricks to uncover what is either extreme incompetence or a deliberate attempt to obfuscate.

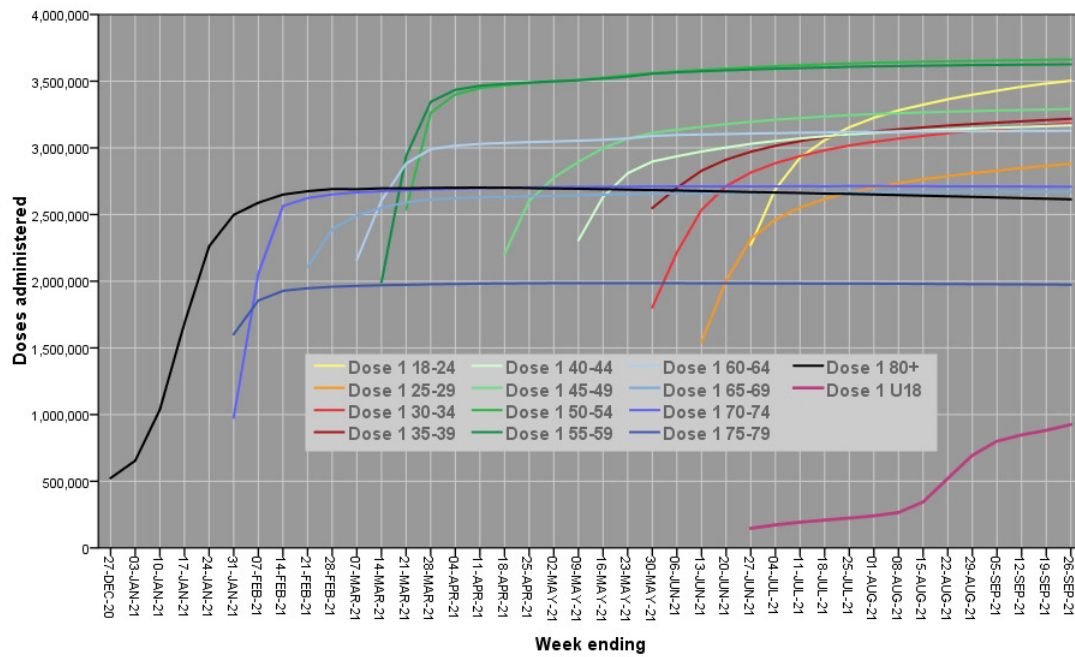
<https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-vaccinations/covid-19-vaccinations-archive/>

## ***Accumulated Weekly Doses by Age Band***

On to my second pot of tea for the day and the first results are popping up. Herewith pleasing and rather colourful charts revealing vaccine administration by age group from 8<sup>th</sup> December 2020 to 26<sup>th</sup> September 2021. I've population estimates obtained from the Office for National Statistics (ONS) so can convert these in percentage uptake figures after a spot of breakfast. Before that I need to model the data to add in all the missing bits of spaghetti that NHS England is rather reluctant to reveal. This will be done using some rather fancy missing value algorithms that use all of the data that we do have (plus other vaccination data that I shall bolt on) to tell us what uptake actually took place in the early stages of those curves.

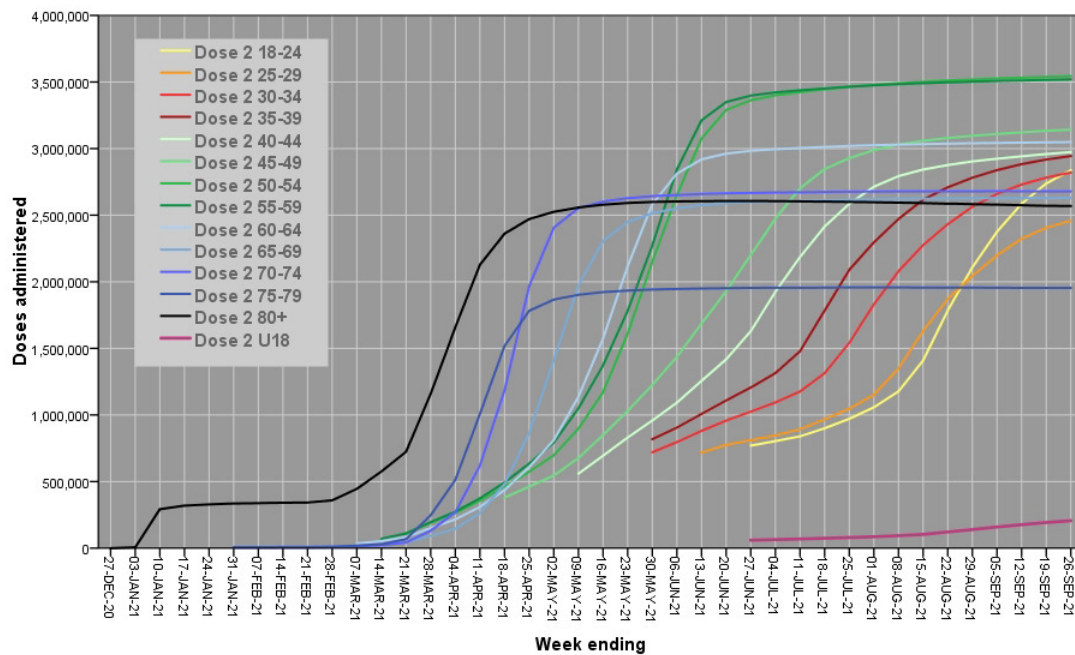
There are some interesting features to consider in slide #1 starting with the slight decline in the accumulated total for 80+ years. I'll check definitions but I'm guessing this is due to corrections and revisions (several weekly files were revised, some more than once). My eyeballs suggest it was the 70-74y group who seriously charged down initial dosing, though the 50-59y exhibit an equally steep rise. Note the initial push for secondary dosing in the 80+y group in slide #2. The blue and green curves of older folk seem pretty similar in slope rate, with younger folk exhibiting less 'acceleration'. The exception here is the 18-24y group who seriously got stuck in to full vaccination during August. Uptake rates will give us a better idea – watch this space!

Weekly accumulated first doses by age band for NHS England



Data Source: NHS England COVID Vaccination Archive

Weekly accumulated second doses by age band for NHS England



Data Source: NHS England COVID Vaccination Archive



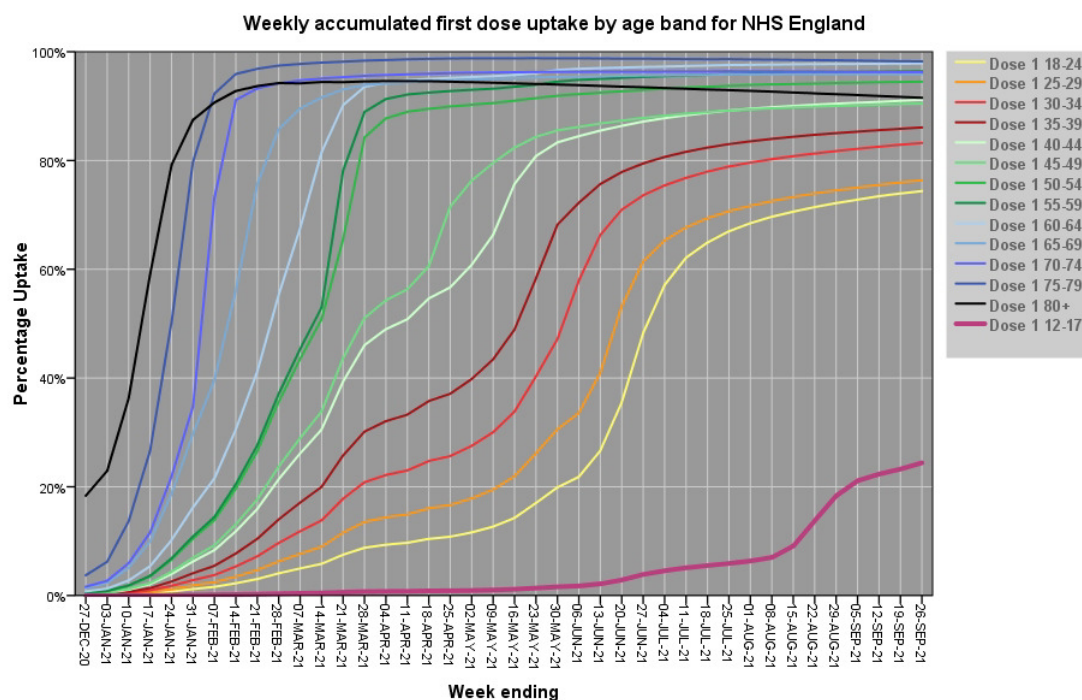
## Accumulated Weekly Uptake by Age Band

Whilst contemplating the aroma of flapjack wafting up from oven below I had an epiphany. I realised I could work backwards in the spreadsheet and use the current weekly breakdown to apportion the prior week. For example, w/e 27<sup>th</sup> June is the first week that full breakdown is offered by the NHS data authority. I can determine that 93.9% of u25y doses were administered to 18-24y, with 6.1% administered to u18y. In the week prior there are 1,781,954 doses marked 'u25' so it is a simple matter to apply these proportions to divvy-up the doses. By working backwards through the coding like this I can arrive at pretty robust estimates of what was going on all the way back to December 2020. No fancy modelling needed – just a trusty hand held calculator!

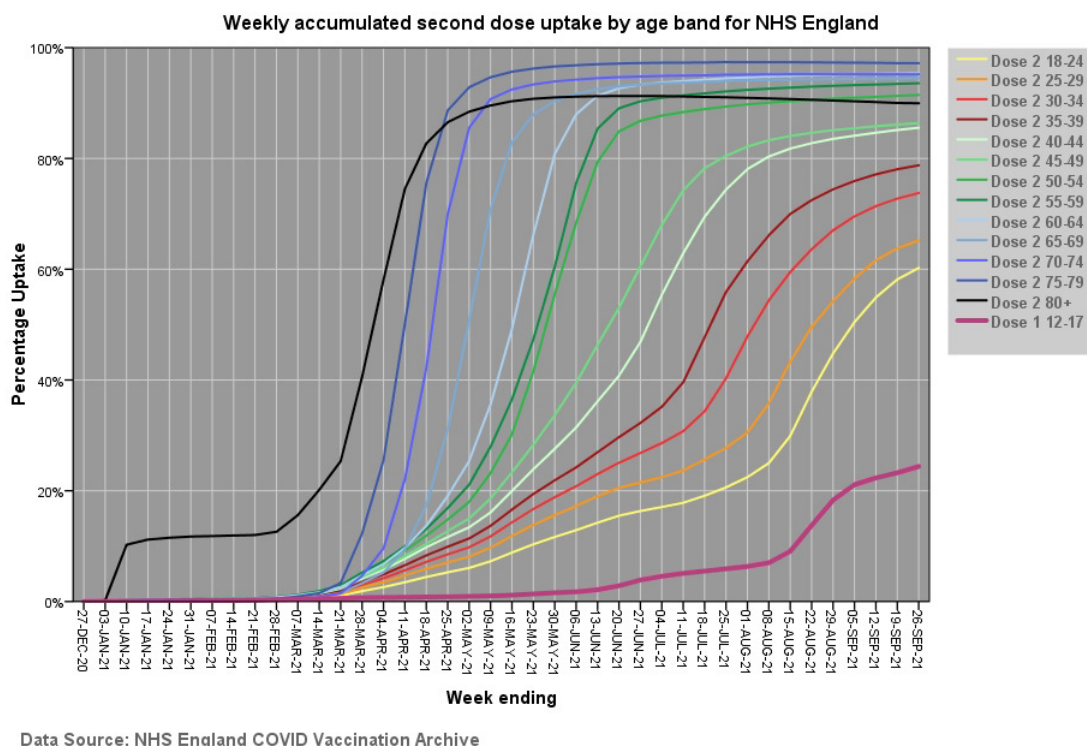
With the spreadsheet populated I could also work backwards to see what population estimates the Office for National Statistics have been using for each age band. The u18y group was tricky since they don't bother to provide estimates of uptake for the youngest sector but fortunately I'm sitting on some natty 2019 mid-year estimates broken down by each year of age. A bit of factoring for growth and Bob's your uncle! I now present two rather colourful charts of vaccine uptake by dose.

Aside from eyeballing what decisions folk have been making there is a very important reason for undertaking this work. I shall be turning these weekly uptake figures into age-adjusted weightings for use in multivariate modelling of deaths and ED admissions intake. I've already been doing this but in a rather crude manner using case weighting based on average uptake for the nation. I can now refine that weighting to produce more robust models. No case weighting, no comment!

For those interested there's a post dated 11<sup>th</sup> Sep (A Short Note On Case Probability) and another dated 25<sup>th</sup> Sep (NHSUK: ED Admissions Observation Bias) where I walk people through the fallacy of counting heads in the emergency room and declaring the vaccines are working/not working. This doesn't stop various authorities, media outlets and experts with vested interests spouting nonsense but that was always going to be the case.



Data Source: NHS England COVID Vaccination Archive



4<sup>th</sup> October 2021

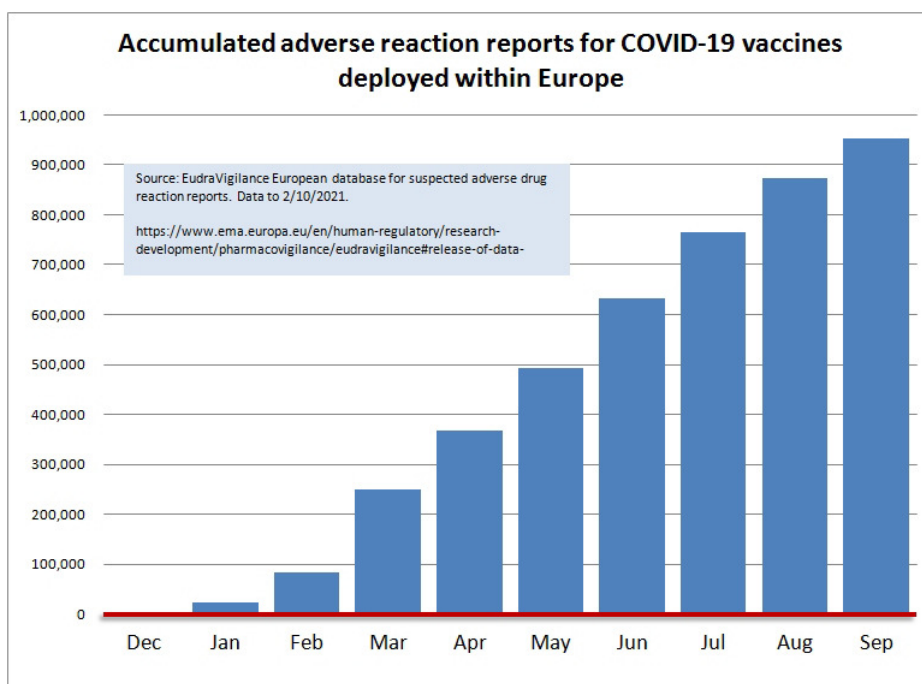
## EudraVigilance Monthly Update

As you study these figures it is worth noting that they are by no means comprehensive, with audits suggesting 1% - 10% data capture at best. I have received several personal communications indicating vaccinated folk are reluctant to acknowledge symptoms let alone report them, and there is concern amongst colleagues that the medical profession is dragging its feet. Both of these behaviours endanger the very alarm system put in place to ensure public safety.

As at 2<sup>nd</sup> October 2021 EudraVigilance reports 26,523 deaths among 1,015,044 individuals who have reported adverse reactions post-vaccination. Accumulated monthly counts continue to rise at a near linear rate estimated at 118,854 reports per month ( $p < 0.001$ ; 95% confidence interval = 111,184; 126,525).

The European Centre for Disease Control (ECDC) reports 278,310,406 vaccinated individuals for the same period, thus returning an adverse incident report rate of 0.360% ( $1,015,044 / 278,310,406$ ) and a fatal report rate of 0.010% ( $26,523 / 278,310,406$ ) for all four biological products. A total of 2,509,498 adverse reactions were suffered by the 1,015,044 individuals concerned, indicating an average of 2.47 post-vaccination events per case. Of these 1,200,967 (47.9%) were categorised as serious, with 1,308,531 (52.1%) categorised as non-serious. Breakdowns for these top line figures may be found in the attached charts.

| As at 2nd Oct 2021 | Total Adverse Reports | Total deaths | Adverse report fatality rate | People receiving vaccine | Post-vaccination adverse report rate | Post-vaccination death rate |
|--------------------|-----------------------|--------------|------------------------------|--------------------------|--------------------------------------|-----------------------------|
| Moderna            | 127,691               | 7,051        | 5.5%                         | 35,983,580               | 0.355%                               | 0.020%                      |
| Pfizer             | 471,211               | 12,545       | 2.7%                         | 194,668,408              | 0.242%                               | 0.006%                      |
| AstraZeneca        | 386,408               | 5,553        | 1.4%                         | 37,967,689               | 1.018%                               | 0.015%                      |
| Janssen            | 29,734                | 1,374        | 4.6%                         | 9,690,730                | 0.307%                               | 0.014%                      |
| Total              | 1,015,044             | 26,523       | 2.6%                         | 278,310,406              | 0.360%                               | 0.010%                      |



#### Fatal Reactions Following COVID-19 Vaccination by Product

| Accumulated Raw Counts            |         |        |             |         |        |
|-----------------------------------|---------|--------|-------------|---------|--------|
| As at 2nd Oct 2021                | Moderna | Pfizer | AstraZeneca | Janssen | Total  |
| Blood & lymphatic system          | 68      | 175    | 230         | 34      | 507    |
| Cardiac                           | 757     | 1,858  | 632         | 132     | 3,379  |
| Congenital                        | 3       | 23     | 7           | 0       | 33     |
| Ear & labyrinth                   | 1       | 9      | 1           | 1       | 12     |
| Endocrine                         | 2       | 5      | 4           | 1       | 12     |
| Eye                               | 20      | 30     | 27          | 6       | 83     |
| Gastrointestinal                  | 274     | 518    | 288         | 64      | 1,144  |
| General & administration site     | 2,656   | 3,574  | 1,337       | 358     | 7,925  |
| Hepatobiliary                     | 29      | 61     | 54          | 9       | 153    |
| Immune system                     | 11      | 66     | 25          | 7       | 109    |
| Infections & infestations         | 514     | 1,233  | 353         | 88      | 2,188  |
| Injury, poisoning & complication  | 130     | 194    | 159         | 17      | 500    |
| Medical Investigations            | 128     | 393    | 130         | 83      | 734    |
| Metabolism & nutritional          | 163     | 227    | 81          | 30      | 501    |
| Musculoskeletal                   | 143     | 157    | 77          | 34      | 411    |
| Neoplasms                         | 46      | 81     | 18          | 2       | 147    |
| Nervous system                    | 716     | 1,361  | 881         | 153     | 3,111  |
| Pregnancy, puerperium & perinatal | 9       | 40     | 11          | 1       | 61     |
| Product issues                    | 2       | 1      | 1           | 0       | 4      |
| Psychiatric                       | 121     | 161    | 53          | 12      | 347    |
| Renal & urinary                   | 119     | 207    | 49          | 16      | 391    |
| Reproductive & breast             | 6       | 4      | 2           | 5       | 17     |
| Respiratory & thoracic            | 704     | 1,467  | 663         | 153     | 2,987  |
| Skin & subcutaneous tissue        | 61      | 113    | 41          | 5       | 220    |
| Social circumstances              | 28      | 16     | 6           | 4       | 54     |
| Surgical & medical procedures     | 71      | 35     | 23          | 44      | 173    |
| Vascular                          | 269     | 536    | 400         | 115     | 1,320  |
| Total                             | 7,051   | 12,545 | 5,553       | 1,374   | 26,523 |

Source: EudraVigilance European database for suspected adverse drug reaction reports  
<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

### Serious Reactions Following COVID-19 Vaccination by Product

| Accumulated Raw Counts            |                |                |                |               |                  |
|-----------------------------------|----------------|----------------|----------------|---------------|------------------|
| As at 2nd Oct 2021                | Moderna        | Pfizer         | AstraZeneca    | Janssen       | Total            |
| Blood & lymphatic system          | 2,613          | 10,368         | 8,249          | 496           | 21,726           |
| Cardiac                           | 8,215          | 22,596         | 11,345         | 1,005         | 43,161           |
| Congenital                        | 0              | 248            | 22             | 29            | 299              |
| Ear & labyrinth                   | 2,681          | 7,463          | 7,804          | 292           | 18,240           |
| Endocrine                         | 218            | 677            | 413            | 37            | 1,345            |
| Eye                               | 3,575          | 10,032         | 11,729         | 612           | 25,948           |
| Gastrointestinal                  | 12,415         | 36,747         | 54,622         | 1,691         | 105,475          |
| General & administration site     | 31,498         | 91,223         | 121,827        | 5,631         | 250,179          |
| Hepatobiliary                     | 485            | 1,062          | 775            | 95            | 2,417            |
| Immune system                     | 2,325          | 9,539          | 3,332          | 287           | 15,483           |
| Infections & infestations         | 7,514          | 24,841         | 16,788         | 1,775         | 50,918           |
| Injury, poisoning & complication  | 5,516          | 11,485         | 6,998          | 581           | 24,580           |
| Medical Investigations            | 3,229          | 16,447         | 11,358         | 2,686         | 33,720           |
| Metabolism & nutritional          | 2,401          | 5,154          | 8,108          | 311           | 15,974           |
| Musculoskeletal                   | 13,754         | 41,797         | 66,676         | 2,381         | 124,608          |
| Neoplasms                         | 364            | 806            | 431            | 0             | 1,601            |
| Nervous system                    | 28,303         | 76,876         | 111,374        | 4,661         | 221,214          |
| Pregnancy, puerperium & perinatal | 592            | 1,367          | 420            | 0             | 2,379            |
| Product issues                    | 0              | 0              | 0              | 0             | 0                |
| Psychiatric                       | 4,707          | 11,907         | 13,275         | 625           | 30,514           |
| Renal & urinary                   | 1,601          | 2,780          | 2,586          | 247           | 7,214            |
| Reproductive & breast             | 1,992          | 10,464         | 7,538          | 227           | 20,221           |
| Respiratory & thoracic            | 10,671         | 30,863         | 24,637         | 1,868         | 68,039           |
| Skin & subcutaneous tissue        | 8,804          | 24,857         | 28,322         | 929           | 62,912           |
| Social circumstances              | 1,302          | 1,768          | 893            | 203           | 4,166            |
| Surgical & medical procedures     | 968            | 712            | 905            | 588           | 3,173            |
| Vascular                          | 6,461          | 19,748         | 17,067         | 2,185         | 45,461           |
| <b>Total</b>                      | <b>162,204</b> | <b>471,827</b> | <b>537,494</b> | <b>29,442</b> | <b>1,200,967</b> |
| Serious to non-serious ratio      | 1.04           | 0.76           | 1.12           | 0.56          | 0.92             |

Source: EudraVigilance European database for suspected adverse drug reaction reports

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>

### Non Serious Reactions Following COVID-19 Vaccination by Product

| Accumulated Raw Counts            |                |                |                |               |                  |
|-----------------------------------|----------------|----------------|----------------|---------------|------------------|
| As at 2nd Oct 2021                | Moderna        | Pfizer         | AstraZeneca    | Janssen       | Total            |
| Blood & lymphatic system          | 3,698          | 19,319         | 4,057          | 275           | 27,349           |
| Cardiac                           | 1,511          | 8,217          | 6,220          | 377           | 16,325           |
| Congenital                        | 5              | 37             | 22             | 0             | 64               |
| Ear & labyrinth                   | 1,248          | 7,340          | 4,206          | 469           | 13,263           |
| Endocrine                         | 44             | 206            | 118            | 15            | 383              |
| Eye                               | 1,228          | 6,879          | 6,189          | 497           | 14,793           |
| Gastrointestinal                  | 14,804         | 58,505         | 44,003         | 5,602         | 122,914          |
| General & administration site     | 54,086         | 192,126        | 146,340        | 15,646        | 408,198          |
| Hepatobiliary                     | 28             | 166            | 105            | 8             | 307              |
| Immune system                     | 419            | 1,636          | 824            | 48            | 2,927            |
| Infections & infestations         | 2,631          | 13,381         | 10,832         | 477           | 27,321           |
| Injury, poisoning & complication  | 1,428          | 2,959          | 4,606          | 190           | 9,183            |
| Medical Investigations            | 2,766          | 11,045         | 11,003         | 1,447         | 26,261           |
| Metabolism & nutritional          | 636            | 2,614          | 3,765          | 173           | 7,188            |
| Musculoskeletal                   | 25,919         | 100,359        | 86,191         | 10,166        | 222,635          |
| Neoplasms                         | 20             | 67             | 113            | 2             | 202              |
| Nervous system                    | 27,032         | 114,017        | 100,012        | 11,988        | 253,049          |
| Pregnancy, puerperium & perinatal | 16             | 76             | 51             | 2             | 145              |
| Product issues                    | 23             | 82             | 51             | 6             | 162              |
| Psychiatric                       | 1,244          | 8,233          | 5,738          | 492           | 15,707           |
| Renal & urinary                   | 228            | 972            | 1,212          | 74            | 2,486            |
| Reproductive & breast             | 3,163          | 17,379         | 6,397          | 1,032         | 27,971           |
| Respiratory & thoracic            | 3,185          | 16,771         | 11,304         | 1,036         | 32,296           |
| Skin & subcutaneous tissue        | 8,320          | 27,268         | 18,406         | 1,577         | 55,571           |
| Social circumstances              | 120            | 349            | 463            | 48            | 980              |
| Surgical & medical procedures     | 116            | 462            | 320            | 5             | 903              |
| Vascular                          | 1,716          | 9,684          | 8,088          | 460           | 19,948           |
| <b>Total</b>                      | <b>155,634</b> | <b>620,149</b> | <b>480,636</b> | <b>52,112</b> | <b>1,308,531</b> |

Source: EudraVigilance European database for suspected adverse drug reaction reports

<https://www.ema.europa.eu/en/human-regulatory/research-development/pharmacovigilance/eudravigilance#release-of-data-section>



## Case Fatality Rate Update

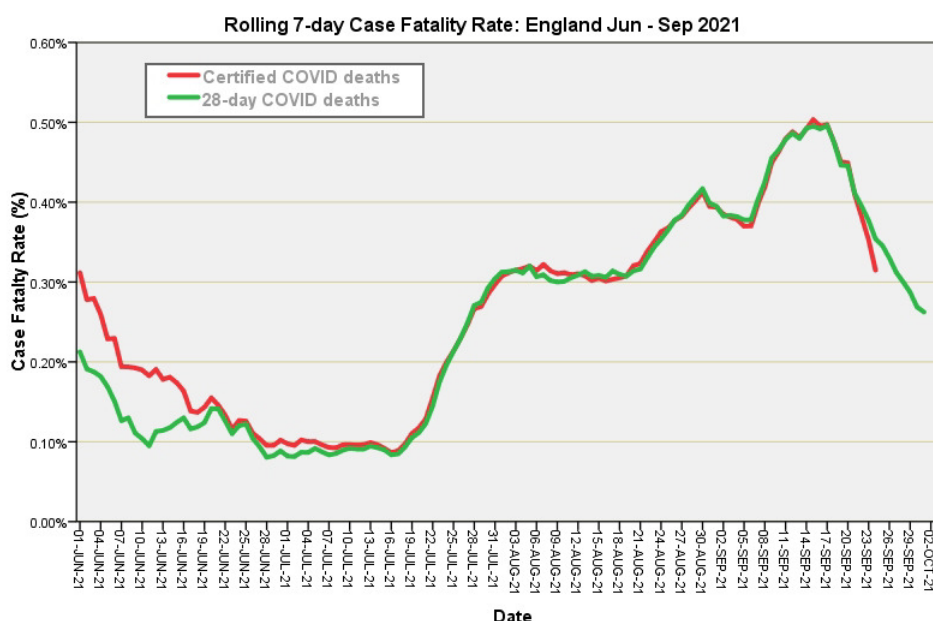
It's been a while since I produced something using UK GOV coronavirus dashboard figures so I sat pondering this glorious autumnal morning on what would make a stonking good slide. The answer was death! Quite appropriate really, for this misty time of the thinning veil used to mark the solemn progression to the death of the old year and the beginning of the new.

So let's have a think about those vaccines for a moment. They were not designed to prevent transmission (unless you happen to be a mainstream journalist or dodgy organisation pretending that they were) but to reduce severity of symptoms. Reducing the severity of symptoms means reduced hospitalisation and reduced death. All a good thing.

Since 8<sup>th</sup> December 2020 we have been busy inoculating anybody breathing, with uptake rising from zero to a whopping great 89.9% uptake for the first dose and 82.6% uptake for the second dose for England as at 4<sup>th</sup> October. Zero to ninety in nine months is going some and so we should expect to see a dramatic decline in COVID deaths. Except we don't.

If we take calculate the rolling 7-day case fatality rate (deaths per 100 cases) in the same manner as the trusty Office for National Statistics (ONS) then we arrive at this pair of curves for the period June – September. The red line represents certified COVID deaths (COVID was mentioned in section I [causal] or section II [co-morbid] of the death certificate) and the green line represents those dying within 28 days of a positive test result (whether or not symptomatic).

I'll leave it to your good judgment as to whether you think the vaccines are working or not.



Source: <https://coronavirus.data.gov.uk/>

## Case Fatality Rate (additional slides)

Some of you want to see what the big picture looks like when plotted all the way back to March 2020, and some of you want to see what the intermediate picture looks like when plotted back to 8th December 2020 when vaccination was rolled out. Here are those two slides.

In contemplating these please do bear in mind that they hold very little clinical meaning. For example, somebody falling off a ladder and dying a week later will count as a 28-day COVID death if they also happen to test positive. The same goes for anybody at the end of their life with cancer, heart failure and everything else we die of.

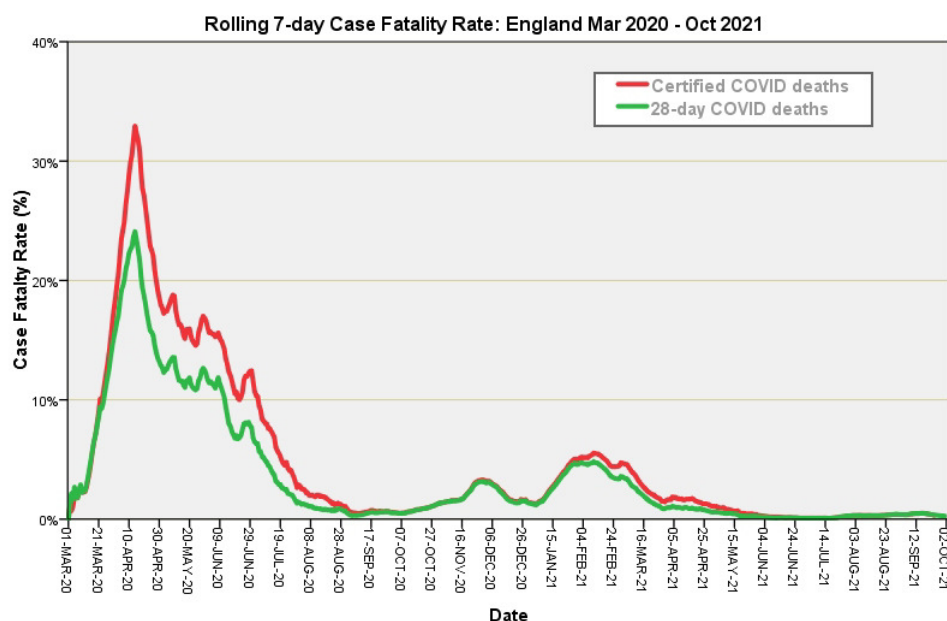
As regards 'certified' deaths again these figures mean very little because certification is simply counting both section 1 (causal) and section II (co-morbid) of the death certificate. Thus, somebody dying from liver failure (section 1 causal) will count as a certified COVID death if the examining physician enters COVID in section II (co-morbid). We are therefore always looking at a mix of both causal and non-causal death whichever series you choose.

Then there's the issue of heterogeneity. Each phase represents a different clinical scenario, starting with deaths of a few very sick folk already in hospital back in March 2020, moving to deaths within the wider community as testing progressed, thence to seasonal death during winter 2020/21. In looking at these slides we are comparing apples to pears and calling them bananas.

Something else to consider is asymptomatic causal COVID death. Thus, if an examining physician is convinced that COVID was the underlying cause of death then this gets entered in section I of the certificate even if the patient didn't have any respiratory condition. For example, the physician may consider death from stroke, sepsis or cardiac arrest to be a function of the virus even if the lungs were working perfectly. Then there's the issue of secondary infection whereby bacterial pneumonia dealt the blow but the physician believes this to be post-viral opportunism, so enters COVID in section I.

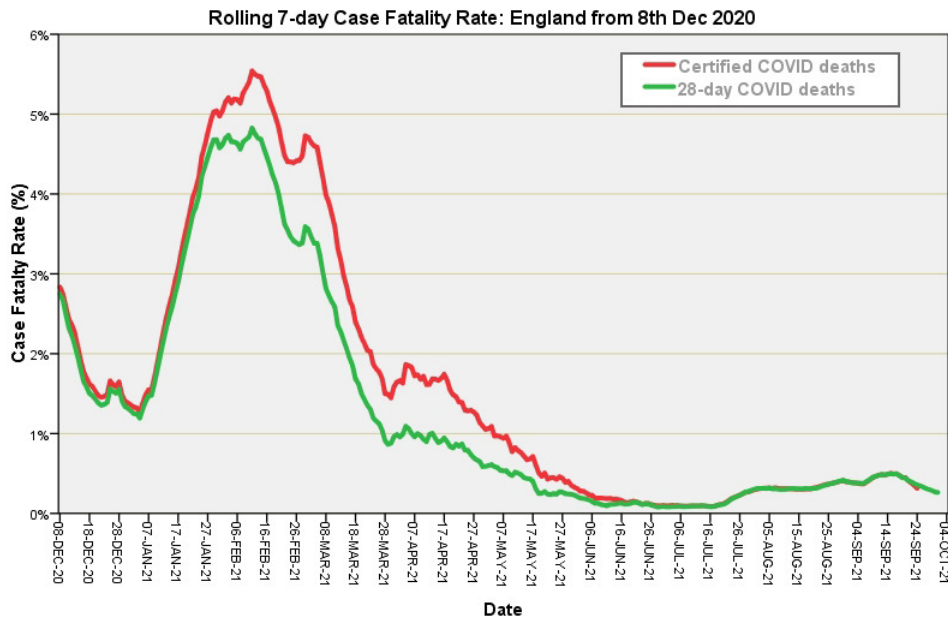
Then there's the issue of iatrogenic death whereby liver failure is brought about by the sheer pharmaceutical load applied (somebody forgot to check the chart during shift changes) or pneumonia is induced by inappropriate use of a ventilator for a patient whose lungs are clotting up (check out ICD10: J95.85 Complication of respirator; J95.851 Ventilator associated pneumonia; J95.859 Other complication of respirator). You won't find these coded in section I for obvious reasons!

These curve balls are something I've discovered upon analysing the electronic patient records of 3,228 alleged COVID deaths. For the vast majority of the media-dependent public death on a ventilator due to respiratory failure is what COVID death is all about, but in grim medical reality this is far from being the case. I can tell you now that of those 3,228 COVID deaths only 15 (0.46%) involved respiratory failure. A lot of work is still to be done but I hope to make a more formal and detailed statement at some point.



Source: <https://coronavirus.data.gov.uk/>





Source: <https://coronavirus.data.gov.uk/>

**13<sup>th</sup> October 2021**

### ***NHSUK: Report 13 – Audit of In-hospital COVID Deaths***

On 23<sup>rd</sup> June 2021 I was given access to a data dump of anonymised electronic patient records for an unknown NHS Authority. The dump comprised 736k electronic records of admissions to an unknown A&E dating back to January 2018, 161k electronic records of admissions to an emergency department dating back to January 2021 and 51k electronic records of in-hospital deaths dating back to April 2017. These data have been subject to detailed statistical analysis and to date thirteen confidential reports have been written for circulation within the profession.

The eleventh report in the series was released to the public on 27<sup>th</sup> September, this summarising the results of an audit of emergency department admissions coding for alleged COVID-19 cases. I now release the thirteenth report in the series, this summarising the results of an audit of in-hospital death coding for alleged COVID-19 cases.

These reports are works in progress in that analytical techniques are being refined and conclusions drawn are being re-evaluated with each new data dump. I therefore ask that folk take note of the report release and obtain the latest version before dissemination. Links to both reports will be provided in the comments section directly below.

Report 11 – Audit of ED COVID-19 Coding

<https://drive.google.com/file/d/1Z22fJFWyBZ6F5EBMsTy34mZ1geS3rykVg/view?usp=sharing>

Report 13 – Audit of In-hospital COVID Deaths

<https://drive.google.com/file/d/1wWWikSQqim4Y6AKl4v6imaj-YSKe9369/view?usp=sharing>

## NHSUK: Over The Shoulder #1

I'm making steady progress preparing the substantial download of electronic patient record (EPR) data kindly provided by a certain NHS authority. Yesterday my focus was on coding treatment and diagnoses for 296,331 admissions to an emergency department for the period Jan – Sep 2021. With that laborious procedure done I treated myself to a quick factor analysis to see how the various measures stood up against each other. Factor analysis is a powerful multivariate technique whereby we can collapse a great raft of variables down into a small subset of vectors called Eigenvalues that explain the data just as well but which iron out the tricky issue of multiple correlation (try Googling multicollinearity for a flavour).

Eigenvalues represent vectors in n-dimensional space and take on their own complex meaning. For example height, chest measurement, hip measurement, collar size, arm length, inner leg length, palm width, hat size, shoe size, glove size, body surface area, body mass index and general weight and fasting weight are all related variables pertaining to our physical form. We can either analyse this list of 14 'raw' variables or we can use factor analysis to boil it down into just two Eigenvalues, these being linear constructs of the raw variables. Those two constructs will gather together all the length measurements into something we might call 'size', and will gather together all the weight measurements into something we might call 'mass'. This gathering usually offers valuable insight into how and why measurements are related.

In the screenshot below you are looking over my shoulder at the results of a factor analysis of those 296,331 ED admissions that is sitting on my screen this very moment. Down the left are the first 16 of 31 raw variables and across the top are the first 9 Eigenvalues of a set of 13. You can see that oxygen therapy and respiratory procedures have been gathered together for the first Eigenvalue as we may expect. The second Eigenvalue has gathered age and vaccination status as we may expect, with the -0.312 coefficient for arrival mode indicating reliance on emergency services rather than own transport.

Now look at the third gathering. Here sits the key COVID diagnosis (positive PCR test result) with COVID compatible complaint (e.g. dyspnoea), a tendency to come in via ambulance (-0.484) and an association with primary respiratory condition (e.g. pneumonia). All this makes total sense. So what is heart failure doing there?

Heart failure is a mechanical deterioration of the heart muscle and/or valves that progresses over many years. Late stage heart failure will lead to respiratory distress and is often associated with pneumonia. What this grouping is telling us is that these long term patients have been bundled with COVID cases. Whoops-a-daisy! I've no feel for the size and scope of this problem as yet but it does mean I've got to go and sort more wheat from more chaff in order to nail genuine symptomatic SARS-COV-2 infection.

If folk enjoy this over-the-shoulder malarkey I'll endeavour to post more like it so you can get a feel for the incidence of teeth-gnashing and head-banging beneath the shallow veneer of statistical poise!

| Rotated Component Matrix <sup>a</sup> |           |       |       |      |       |      |       |   |      |
|---------------------------------------|-----------|-------|-------|------|-------|------|-------|---|------|
|                                       | Component |       |       |      |       |      |       |   |      |
|                                       | 1         | 2     | 3     | 4    | 5     | 6    | 7     | 8 | 9    |
| Oxygen therapy                        | .943      |       |       |      |       |      |       |   |      |
| Respiratory Procedures                | .941      |       |       |      |       |      |       |   |      |
| Vaccination status                    |           | .847  |       |      |       |      |       |   |      |
| Age                                   |           | .812  |       |      |       |      |       |   |      |
| COVID compatible complaint?           |           |       | .663  |      |       |      |       |   |      |
| Arrival Mode                          |           | -.312 | -.484 |      |       |      | -.338 |   |      |
| Primary Respiratory                   |           |       | .430  |      |       |      |       |   |      |
| Heart Failure                         |           |       | .424  |      |       |      |       |   |      |
| COVID-19 Diagnosis                    |           |       | .340  |      |       |      |       |   |      |
| Arrhythmia                            |           |       |       | .854 |       |      |       |   |      |
| SARS-COV-2 Dx                         |           |       |       | .784 |       | .361 |       |   |      |
| Cardiac Procedures                    |           |       |       |      | .640  |      |       |   |      |
| Oral & Written Guidance               |           |       |       |      | -.637 |      |       |   | .263 |
| IV Lines & Cannulation                |           |       | .304  |      | .584  |      | .296  |   |      |
| Clotting                              |           |       |       |      |       | .704 |       |   |      |
| AMI                                   |           |       |       |      |       | .683 |       |   |      |

## NHSUK: Over The Shoulder #2

In OTS#1 we found heart failure mixed up with a bunch of COVID diagnostic variables following factor analysis. At this point we had no idea if heart failure cases were mistakenly labelled as COVID on admission or whether COVID was hitting these patients particularly hard or whether something else is afoot. It turns out something else is afoot. If we throw the data through Pearson bivariate correlation we get this slice of output that is sitting on my screen right now.

The really good news is that heart failure is not being mixed up with COVID diagnosis since the correlation coefficient is seriously small and piddly ( $r=-0.006$ ). Neither is it being mixed up with acute respiratory conditions like pneumonia and respiratory failure ( $r=0.021$ ). What is happening is that heart failure cases are presenting with a range of complaints that tend to be similar to those for COVID ( $p=0.133$ ) and, like COVID compatible complaints, they tend to arrive in an ambulance rather than make their own way in ( $p=0.109$ ). This overlap in arrival method and presentation is what has placed heart failure in with COVID rather than in a family group of its own.

I'm rather relieved to learn this because it means I don't have to re-think my strategy for identifying symptomatic COVID cases. It also means that clinicians and coders are not getting muddled at the sharp end.

| Correlations                                                 |                     |               |                             |
|--------------------------------------------------------------|---------------------|---------------|-----------------------------|
|                                                              |                     | Heart Failure | COVID compatible complaint? |
| Heart Failure                                                | Pearson Correlation | 1             | .133**                      |
|                                                              | Sig. (2-tailed)     |               | .000                        |
|                                                              | N                   | 296331        | 296331                      |
| COVID compatible complaint?                                  | Pearson Correlation | .133**        | 1                           |
|                                                              | Sig. (2-tailed)     | .000          |                             |
|                                                              | N                   | 296331        | 296331                      |
| COVID-19 Diagnosis                                           | Pearson Correlation | -.006**       | .151**                      |
|                                                              | Sig. (2-tailed)     | .001          | .000                        |
|                                                              | N                   | 296331        | 296331                      |
| Primary Respiratory                                          | Pearson Correlation | .021**        | .188**                      |
|                                                              | Sig. (2-tailed)     | .000          | .000                        |
|                                                              | N                   | 296331        | 296331                      |
| Arrival Mode                                                 | Pearson Correlation | .109**        | .293**                      |
|                                                              | Sig. (2-tailed)     | .000          | .000                        |
|                                                              | N                   | 291853        | 291853                      |
| **. Correlation is significant at the 0.01 level (2-tailed). |                     |               |                             |

21<sup>st</sup> October 2021

## NHSUK: COVID vs COVID

Sometimes when you press the wrong button you end up with a lovely surprise. This happened to me this afternoon when I inadvertently crosstabulated the COVID diagnosis made in the emergency department (ECD) with the COVID diagnosis made by the clinical coders if a patient dies (IHD). Only 4,162/4,677 (89%) of the records told the same story!

Do we believe ED staff when they claim 471 admissions didn't test positive, or do we believe the Trust clinical coding team when they claim these 471 folk most certainly died with COVID? Should we then also believe ED staff who secured 44 positive diagnoses despite the Trust coding team over-riding this and declaring utter nonsense?

Hopefully you'll understand why it's taking me forever to unravel a couple of million electronic patient records so we can say something sensible about genuine COVID infection rates, genuine COVID admission rates, genuine COVID treatment rates and genuine COVID death rates from a clinical perspective rather than a political or corporate perspective.

### COVID-19 Diagnosis (ECD) \* COVID-19 Diagnosis (IHD) Crosstabulation

| Count                    |     | COVID-19 Diagnosis (IHD) |     | Total |
|--------------------------|-----|--------------------------|-----|-------|
|                          |     | No                       | Yes |       |
| COVID-19 Diagnosis (ECD) | No  | 3855                     | 471 | 4326  |
|                          | Yes | 44                       | 307 | 351   |
| Total                    |     | 3899                     | 778 | 4677  |

25<sup>th</sup> October 2021

### *Are The Vaccines Working?*

Anybody who did biology at school will have gone on a field trip at some point. What seemed like a fabulous adventure when announced in class invariably turned out to be a rather boring slog as the teacher handed out work sheets, digging forks and large wooden frames that nobody wanted to lug around, especially on a hot day. We were told to find a space, throw the frame down and count the flowers inside, then do it again over by the trees, and again over by the stream and so on. Those frames defined a standard area of ground enabling us to compare wildflower density in different locations. Without them we'd end up with numerical nonsense.

Lack of a standard frame is precisely how authorities worldwide are going about counting the pandemic. Some ignore the need for a frame altogether and publish raw counts, whilst others change the size of the frame without telling anybody. This tells us that the authorities in charge of our lives are not in the slightest bit interested in tracking the health of the nations in their care. Neither are the many experts and committees carefully chosen by said authorities that bothered either, apart from a slap of lip-service.

So let us make our own crude frame, this being the daily flowering rate that is COVID cases per 100 viral tests undertaken under pillar 1 and pillar 2 of the testing regime for England. Let us not put the frame down until 10th February 2021, thereby allowing a full 3 weeks for post-vaccination immunity to accrue after rollout of the second dose began on 19th January 2021. Let us count the wildflowers up to 30th September 2021 and let us consider sliding second dose vaccination uptake figures along by 21 days to allow for a 3 week lag in vaccine benefit, thus following the analytical protocol established by ONS/PHE and others.

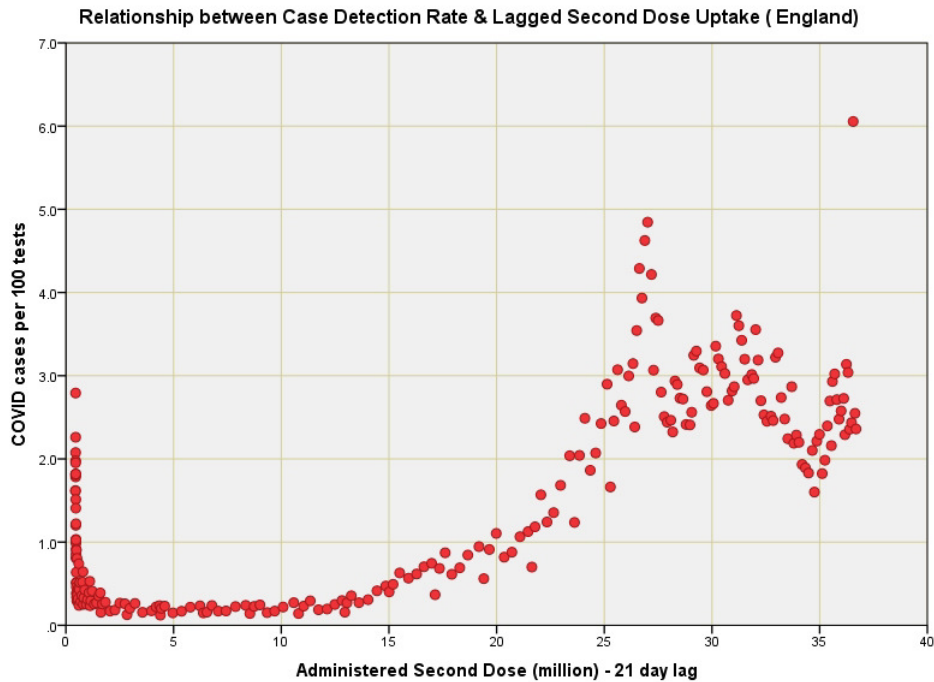
If we do all this and we plot the case detection rate against lagged second dose uptake we arrive at the following scatterplot (N.B. please do remember this is based on official UK GOV dashboard data and is a plot anybody can replicate for themselves, thus confirming lack of trickery on my part).

Any normal person looking at this would be forced to conclude that there is a positive relationship between the case detection rate and administration of the second dose of magical life-giving elixir i.e. the jab seems to be making things worse.

Any abnormal person would argue that these are crude rates and don't take into account many factors like the colour of socks, hair style and that sort of thing. Bizarrely, that same abnormal person would then use similarly crude estimates churned out by various authorities (including themselves) to support a different set of arguments. I would call this getting religion but it gives religion a bad name.

Note the phrase 'seems to be' – we can only infer and not conclusively conclude. We may argue that development of vigorous new strains has thrown the spanner in the works but the problem here is that we're talking height of summer when coronaviruses historically tend to hide. This sort of argument also shoots itself in both feet, since it argues the case for vaccine failure.

We may argue that PCR test sensitivity has thrown a spanner in the works. This sort of argument also shoots itself in both feet, since it argues the case for test protocol failure. If Occam were to get his razor out he'd declare that we're looking at total abysmal failure of a rather grand medical experiment.



### ***Test Standardised Cases***

In my previous post entitled 'Are The Vaccines Working?' I introduced the concept of the wooden sampling frame that is used in all biology field trips to ensure we're counting things like bugs and wildflowers within the same standardised unit area. If you want to count a few wildflowers then use a pithering 12" square frame; if you want to count a large number then go drag along a 6 x 6 foot frame and impress the teacher.

The same is true of COVID cases. We can either test the people in just our street or go and test the population of the entire region. If we do the latter we'll get more cases because there are more people in the region than our street. Although this sounds utterly and totally banal it is surprising how many authorities forget that the more tests that are done, the more cases they are going to detect (assuming all things are equal).

So how do we account for the differing test volume over time? There are several ways to do this as a statistician but a beautifully simple way is to derive the mean number of daily tests over a period of time and use this to standardise the data in the same way that we standardise shifting populations. Once we've standardised our tests it is a simple matter to standardise the number of cases detected by these tests.

My trusty hand-held calculator tells me that the average number of daily tests for England Pillar 1 and Pillar 2 fetches up at 458,039.55 viral tests per day. If we standardise case counts at this level of testing the following graph emerges.

**29<sup>th</sup> October 2021**

### ***NHSUK: Results From Simulation Study (I)***

In the last few posts we've chewed the cud over the non-random nature of data and the multitude of biases that we cannot possibly hope to account for and the group has been instrumental in helping me formulate a whole new approach for solving what appears to be an intractable problem. Until we solve these fundamental problems we cannot say anything about vaccine benefit or disbenefit. Well actually we can, but what we say isn't going to be worth tuppence!

Whilst sitting in my battered Land Rover watching masked shoppers yesterday I hit upon the idea of randomising the data and comparing randomised datasets to the original. This morning I narrowed this scope down to investigating the EPR of 9,783 in hospital deaths since 8<sup>th</sup>

December 2020 for a sizeable NHS Trust that must remain unnamed. The EPR enables me to know if and when these people were vaccinated prior to death and whether their death was associated with a diagnosis of COVID. It is thus a simple matter to crosstabulate vaccination status with COVID status to see how the cookie has crumbled in terms of crude benefit/disbenefit.

The cunning bit is to do this for the original source data and randomised datasets. What I mean by randomised is that the vaccination records are mixed up in relation to the patient record. We may then apply varying degrees of randomisation to see how the cookie crumbles once more. This approach is known as a simulation study for which statisticians use deliberately faked or constructed data to understand the deep nature of complex relationships.

For this initial run I opted to shift the vaccination records by 1 patient, by 10 patients, by 100 patients and by 1,000 patients. Each of these results in randomised (simulated) data such that COVID diagnosis at death bears absolutely no relationship to the vaccination record. Crosstabulations of COVID status and randomised vaccination status should thus yield a null result; that is to say there should be no discernible correlation. For good measure I also totally randomised all 9,793 records. I am hoping folk will understand what I've done and why because the results are nothing short of astounding and blow every darn analysis made by every darn analyst claiming vaccine benefit clean out of the water.

In plain English and in a nutshell I found an apparent vaccine benefit for records randomised by 1 patient, 10 patients, 100 patients and 1,000 patients. What expert folk are claiming around the globe is thus nothing more than an illusion. It is only when I come to totally randomise all 9,783 records that the illusion of vaccine benefit disappears and we find no correlation between COVID status and vaccination status.

Experienced statisticians will immediately understand what has been happening. Age-prioritised rollout, initial targeting of the vulnerable, declining disease prevalence over time, seasonal death, behavioural changes, policy changes and all the rest are all multiply correlated variables (check out multicollinearity) and correlated over time. These biases have served to systematically skew figures such that we may observe what appears to be genuine vaccine benefit. Some analysts (including myself) have attempted to account for these biases but it is impossible to account for them all.

This simple simulation study has allowed us to see that vaccine benefit (in terms of COVID-diagnosed in-hospital death) is nothing more than a product of multiply correlated influences coming together. Even by sliding records across 1,000 patients we see the illusion peeking through! I would advise all analysts with access to individual patient records to try such simulation studies for themselves.

I have avoided a lot of statistical jargon and printout in this post but my entire output log can be found at the link in the comments directly below. Statistical output for initial simulation study into vaccine benefit/disbenefit:

<https://drive.google.com/file/d/14s6RFdv3riCbyzVd3rpk7PIhMlmmOq9z/view?usp=sharing>

## ***NHSUK: Results From Simulation Study (II)***

I was going to entitle this one \*'Could Death Stand Still Please?\*' because I've flushed something else that doesn't make clinical sense. Being nosy I wanted to get a better handle on why vaccine benefits can be seen in quasi-randomised treatment data for in-hospital COVID deaths and realised this must be something to do with data structures over time. Instead of disappearing up my own jacksy I decided to look at something simple like COVID diagnosis by vaccination status at death for the 9,793 in-hospital deaths in my database on a month-by-month basis.

I attach a screenshot of some wacko summary results of that cross-tabulation that are telling us we only see vaccine benefit (in terms of lowered incidence of COVID amongst in-hospital deaths) for the months of Jan, Feb, Mar, Jun, Jul and Aug. During Dec, Apr, May and Sep there isn't any sign of statistical significance. What sort of vaccine is it that works some months and not others? More grist to the simulation mill results methinks!

Tomorrow I shall be taking a look at hospitalisation using 300k EPR of admissions to A&E and my new-fangled simulation approach to see if we can detect any excess benefit that has accrued amongst the living if not amongst the dead. I sure hope so otherwise there will be hell to pay.



#### Symmetric Measures

| Year.Month |                    |                         | Value | Approximate Significance |
|------------|--------------------|-------------------------|-------|--------------------------|
| 2020.12    | Nominal by Nominal | Contingency Coefficient | .021  | .517                     |
|            | N of Valid Cases   |                         | 994   |                          |
| 2021.01    | Nominal by Nominal | Contingency Coefficient | .061  | .013                     |
|            | N of Valid Cases   |                         | 1655  |                          |
| 2021.02    | Nominal by Nominal | Contingency Coefficient | .160  | .000                     |
|            | N of Valid Cases   |                         | 1241  |                          |
| 2021.03    | Nominal by Nominal | Contingency Coefficient | .135  | .000                     |
|            | N of Valid Cases   |                         | 984   |                          |
| 2021.04    | Nominal by Nominal | Contingency Coefficient | .028  | .428                     |
|            | N of Valid Cases   |                         | 831   |                          |
| 2021.05    | Nominal by Nominal | Contingency Coefficient | .032  | .325                     |
|            | N of Valid Cases   |                         | 945   |                          |
| 2021.06    | Nominal by Nominal | Contingency Coefficient | .083  | .019                     |
|            | N of Valid Cases   |                         | 799   |                          |
| 2021.07    | Nominal by Nominal | Contingency Coefficient | .127  | .000                     |
|            | N of Valid Cases   |                         | 960   |                          |
| 2021.08    | Nominal by Nominal | Contingency Coefficient | .183  | .000                     |
|            | N of Valid Cases   |                         | 901   |                          |
| 2021.09    | Nominal by Nominal | Contingency Coefficient | .021  | .633                     |
|            | N of Valid Cases   |                         | 521   |                          |
| Total      | Nominal by Nominal | Contingency Coefficient | .280  | .000                     |
|            | N of Valid Cases   |                         | 9831  |                          |

31<sup>st</sup> October 2021

### NHSUK: A Spooky Game

Tonight will be All Hallows' Eve when the veil thins and kids get annoying. I was going to pen a piece about a game called *'bugs and bowls'* in which I demonstrate the principle of bias using coloured blue bowls (vaccine) and little red bugs (COVID) on a wooden board (in-hospital deaths) but this seems to have grown into a natty table that is going to hurt a few brain cells. My apologies.

Games can be fun but they can be used to guide the fate of nations. I know this because, as rather green and limpid PhD student, I shared a house with three lecturers in the field of Game Theory and Risk Management. These went on to do great things that shaped the nation whilst I decided that women, tapas and continental beers were far more interesting than my annoying thesis.

Anybody who understands this game theory-inspired slide is likely to have one of those Aha! Moments, which was precisely what I exclaimed shortly after dawn. Let me try and talk folk through it...

We start with 9,783 adult ( $\geq 16$ y) in-hospital deaths and determine the proportion who died after vaccination (0.517 or 51.7% in old money). We then determine the proportion who died with COVID (0.179 or 17.9% in old money). Knowing these two figures we then build a joint probability table based on the assumption of independence. This sounds fancy but it is simply multiplying 0.517 by 0.179 to get 0.093 as the theoretical joint probability of a vaccinated COVID death within the sample.

We then colour code the matrix according to cells that infer vaccine benefit (green) and cells that infer disbenefit (pink). Stop and have a think why this is so because this is a vital step in understanding.

We then add the two green values together to get the combined joint probability for vaccine benefit (0.511), and we add the two pinks cells together to get the combined joint probability for vaccine disbenefit (0.489).

These two figures tell us something very important indeed. They tell us that even if we randomise the data vaccine benefit is always going to be a more probable result than disbenefit. We may call this intrinsic bias, and until it is accounted for we are not going to be producing reports that are worth tuppence!

**Joint Probability Matrix**  
(based on 9,783 in-hospital deaths)

| <i>Observed probabilities</i>                   |              | Unvaccinated | Vaccinated   |
|-------------------------------------------------|--------------|--------------|--------------|
|                                                 |              | <b>0.483</b> | <b>0.517</b> |
| Non-COVID death                                 | <b>0.821</b> | 0.397        | 0.424        |
| COVID death                                     | <b>0.179</b> | 0.086        | 0.093        |
| Vaccine benefit (combined joint probability)    |              |              | 0.511        |
| Vaccine disbenefit (combined joint probability) |              |              | 0.489        |

NOTE: Hence in a randomised data pool vaccine benefit will always be apparent owing to a slight edge on joint probability. To address this issue within real data we have to weight cases accordingly to avoid inherent bias. Nobody is doing this.