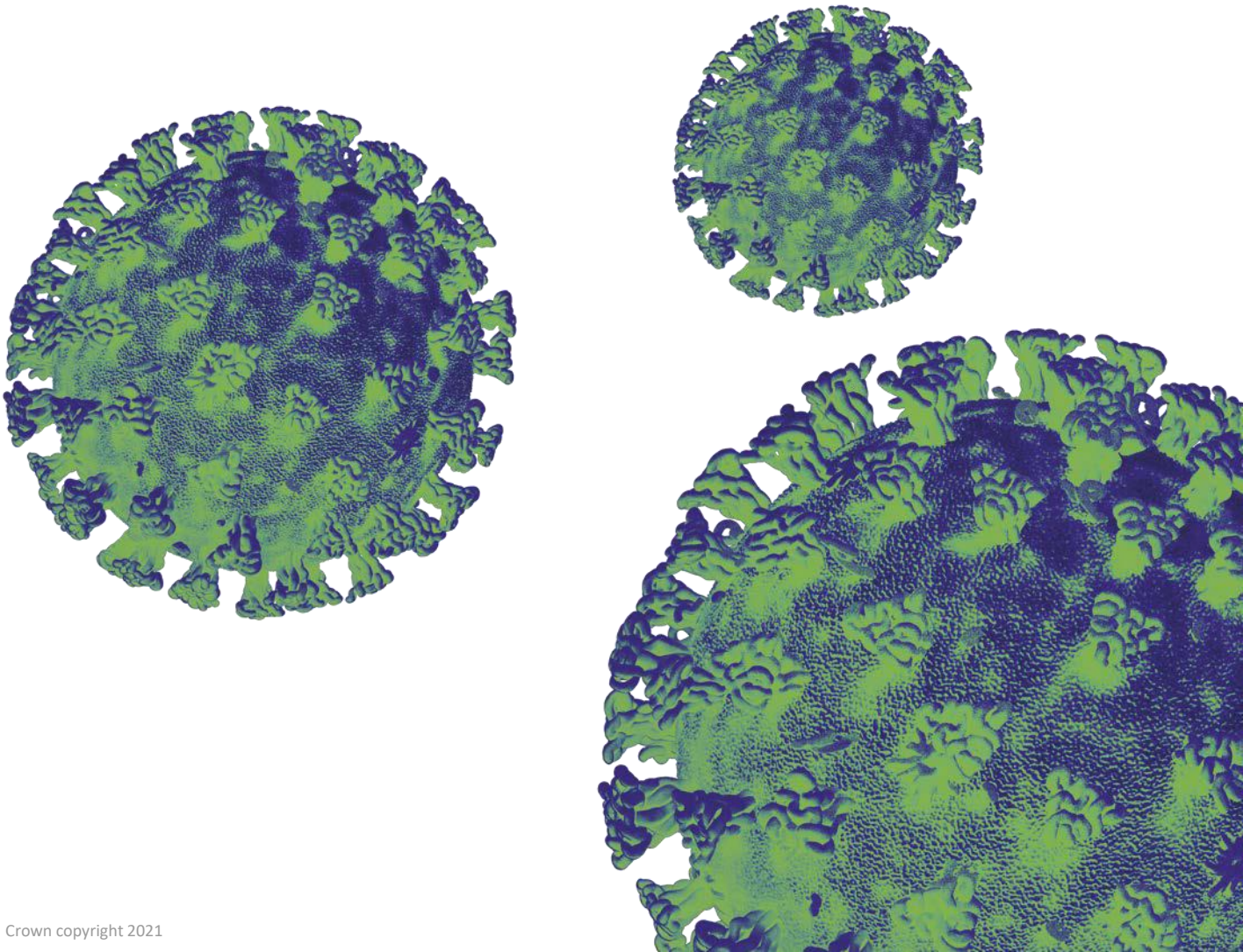
Llywodraeth Cymru
Welsh Government

# Technical Advisory Cell

# Summary of Advice

## 24 September 2021



# Technical Advisory Cell: Summary of Advice

24 September 2021



## Top line summary

- Overall cases of COVID-19 remain high across Wales, although the rate of growth has slowed and test positivity has continued to decrease to 15% for the 7 day period ending 19 September.
- Hospital bed and ICU occupancy has been generally increasing in all health boards across Wales. As at 22 September 2021, there were 645 COVID-19

related patients (Suspected, Confirmed and Recovering) occupying a hospital bed (-23 since previous week), of which 463 were confirmed. As at 22 Sep 2021, there are 49 patients with Suspected or Confirmed COVID-19 in critical care beds in Wales; 115 lower than the maximum COVID-19 position of approximately 164. The number of deaths is increasing, but remains relatively low in comparison to previous periods of similar case incidence at 62 deaths per week, compared to around 190 during the second wave.

- In the latest estimates for Wales from the Coronavirus (COVID-19) Infection Survey (CIS) it is estimated that 1.67% of the Wales community population had COVID-19 (95% credible interval: 1.31% to 2.06%). This equates to approximately 1 person in every 60 (95% credible interval: 1 in 75 to 1 in 50), or 50,700 people during this time (95% credible interval: 39,900 to 62,700). This compares to around 1 in 90 people in England, around 1 in 45 people in Scotland, and around 1 in 66 people in Northern Ireland.

- The Joint Biosecurity Centre (JBC) consensus estimate of the reproduction number ($R_t$) for Wales is between 0.8 and 1.0 (as at 22 September 2021), while Public Health Wales estimate of $R_t$ is around 1.1. (22 September 2021). Note that JBC's estimate is typically lagged by 2-3 weeks while PHW, which uses a different methodology, is lagged by around 1 week.

- Observed levels of confirmed COVID-19 cases, COVID-19 admissions to hospital and ICU, and ICU occupancy are above the levels estimated by the June 2021 reasonable worst case (RWC) scenario. COVID-19 hospital bed occupancy and COVID-19-related deaths are between the most likely scenario (MLS) and the RWC scenario. These model scenarios are due to be updated imminently to take into account updated assumptions and the move to alert level zero on 7 August 2021.

- A surveillance report from PHW on characteristics of patients admitted to hospital with a positive COVID-19 test in the 4 weeks ending 19 September highlights 1 in 3 confirmed COVID-19 cases were unvaccinated and 99% of those who tested positive were under 60. Of these, 37% were unvaccinated. Nearly 13% of hospital patients with confirmed Covid were unvaccinated. Note that in the context of very high vaccine coverage in the population, even with a highly effective vaccine, it is expected that a large proportion of cases would occur in vaccinated individuals, simply because a larger proportion of the population are vaccinated than unvaccinated.

- Cases of Respiratory Syncytial Virus (RSV) remain well above the threshold that would normally indicate very high activity at 184.5 per 100,000 in children aged under 5, although testing is also higher than previous years. The current increase in cases is earlier than the usual RSV season in Wales and it is unclear whether it will follow the usual epidemic pattern for RSV. Influenza is not currently circulating in Wales.

- An ONS technical report identifying characteristics of people more likely to test positive for COVID-19 highlights a higher risk for those who are unvaccinated, those without prior infection, those who never wear face coverings, those with a ride range of contacts and those in younger age groups.

- A study highlighted in the New England Journal of Medicine (NEJM) states that a review of the CSC v-safe pregnancy registry has shown vaccination results in no increased risk of miscarriage. The Royal College of Obstetricians and Gynaecologists have previously released guidance on vaccines, pregnancy and breastfeeding (link), stating vaccination is the best way to protect against the known risks of COVID-19 in pregnancy for both women and babies, including admission of the woman to intensive care and premature birth of the baby.

- A randomised control trial published in the Lancet suggests that daily contact testing could be an alternative to home isolation of close contacts of students following school-based exposures, resulting in similar levels of transmission and reduced loss of learning.

- A report from the ONS highlights the importance of clear definitions when considering the prevalence of Long COVID and the impact on individuals, with three approaches ranging from 3% to 11.7% of Coronavirus Infection Survey participants with post-acute symptoms 12 weeks after infection.

- Another report from the ONS looking at age-standardised deaths involving COVID-19 reinforces that risk of death involving COVID-19 was consistently lower in those who had received two vaccinations.

- A BMJ-published study suggests that compared with other adults of working age teachers are not at increased risk of hospital admission with COVID-19 and are at lower risk of severe COVID-19 outcomes.

- A CDC report examining an outbreak in a Texas Prison in which the majority of incarcerated persons were infected despite high levels of vaccination recommends that while vaccination is important to reduce serious COVID-19 related illness and death, maintaining multicomponent prevention strategies such as testing and isolation and use of face masks remains critical to limiting SARS-CoV-2 transmission in high population settings where physical distancing is challenging.

## Wales Sit-Rep

- The latest COVID-19 Situational Report, containing the most recent data on epidemiological surveillance, NHS status, wastewater monitoring, education and children, international travel, mobility, vaccination and population immunity and forward projections for Wales is available here.

- Overall cases of COVID-19 remains high across Wales, with test positivity continuing to decrease for a third week. The rate of growth has decreased over the past few weeks, while test positivity has fallen to 15%.

- Hospital bed and ICU occupancy has been generally increasing in all health boards across Wales. As at 22 September 2021, there were 645 COVID-19 related patients (Suspected, Confirmed and Recovering) occupying a hospital bed (-23 since previous week), of which 463 were confirmed. As at 22 Sep 2021,

there are 49 patients with Suspected or Confirmed COVID-19 in critical care beds in Wales; 115 lower than the maximum COVID-19 position of approximately 164. The number of deaths is increasing, but remains relatively low in comparison to previous waves.

- The JBC consensus estimate of the reproduction number for Wales is between 0.8 and 1.0 (as at 22 September 2021), while PHW's estimate is around 1.1. (22 September 2021). Note that JBC's estimate is typically lagged by 2-3 weeks while PHW, which uses a different methodology, is lagged by around 1 week.

- PHW's national estimate of $R_t$, which is lagged by around 1 week, is estimated to be 1.1 for Wales (23 September 2021) with a doubling time of 44 days. The central $R_t$ estimate is highest for Cwm Taff, Swansea Bay and Cardiff & Vale at 1.15.

- As at 22:00 21 September 2021 2,382,032 (+12,311) first doses and 2,211,226 (+6,125) second doses have been received by the Welsh population. A breakdown of uptake by priority group and age is below (Source: PHW)

| Group | Group size (n) | Received 1st dose (n) | Received 2nd dose (n) | 1st dose uptake (%) | 2nd dose uptake (%) |
|---|---|---|---|---|---|
| Care home residents | 13,949 | 13,684 | 13,395 | 98.1% | 96.0% |
| Care home worker | 39,102 | 36,786 | 35,611 | 94.1% | 91.1% |
| 80 years and older | 167,620 | 161,204 | 159,500 | 96.2% | 95.2% |
| Health care worker | 143,465 | 139,142 | 136,443 | 97.0% | 95.1% |
| Social care worker | | 44,911 | 44,305 | | |
| Aged 75-79 years | 131,403 | 127,404 | 126,443 | 97.0% | 96.2% |
| Aged 70-74 years | 182,294 | 175,618 | 174,430 | 96.3% | 95.7% |
| Clinically extremely vulnerable aged 16-69 years | 80,787 | 76,739 | 75,281 | 95.0% | 93.2% |
| Aged 65-69 years | 179,810 | 171,066 | 169,400 | 95.1% | 94.2% |
| Clinical risk groups aged 16-64 years | 353,496 | 320,030 | 308,471 | 90.5% | 87.3% |
| Aged 60-64 years | 205,170 | 191,877 | 189,350 | 93.5% | 92.3% |
| Aged 55-59 years | 233,386 | 214,220 | 210,617 | 91.8% | 90.2% |
| Aged 50-54 years | 228,339 | 205,397 | 200,887 | 90.0% | 88.0% |
| Aged 40-49 years | 394,943 | 335,610 | 322,958 | 85.0% | 81.8% |
| Aged 30-39 years | 428,083 | 334,496 | 310,348 | 78.1% | 72.5% |
| Aged 18-29 years | 486,658 | 376,530 | 335,443 | 77.4% | 68.9% |
| Aged 16-17 years* | 81,607 | 57,442 | 11,663 | 70.4% | 14.3% |

- The most recent issue of the ONS Coronavirus (COVID-19) Infection Survey results, 12 to 18 September, suggests the percentage of people testing positive has increased in the most recent two weeks in Wales, but the trend is uncertain in the most recent week. In England, the percentage of people testing positive decreased in the most recent week. The trend was uncertain in Northern Ireland and appeared to have levelled off in the most recent week in Scotland.

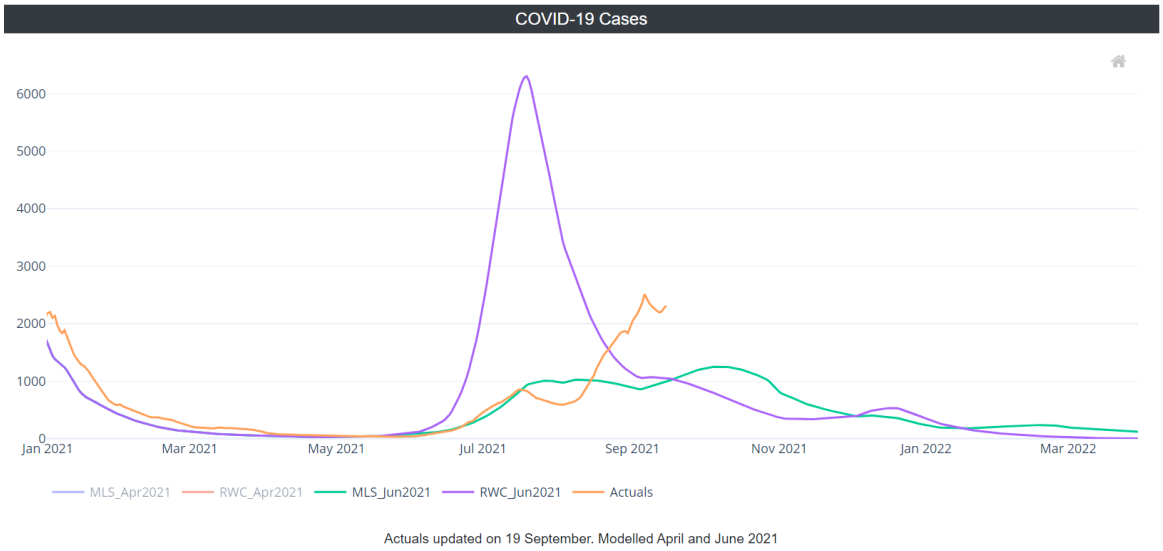
- It is estimated that 1.67% of the community population had COVID-19 (95% credible interval: 1.31% to 2.06%). This equates to approximately 1 person in every 60 (95% credible interval: 1 in 75 to 1 in 50), or 50,700 people during this time (95% credible interval: 39,900 to 62,700). This compares to around 1 in 90 people in England, around 1 in 45 people in Scotland, and around 1 in 66 people in Northern Ireland.

## Reasonable Worst Case and Most Likely Scenarios versus actual figures

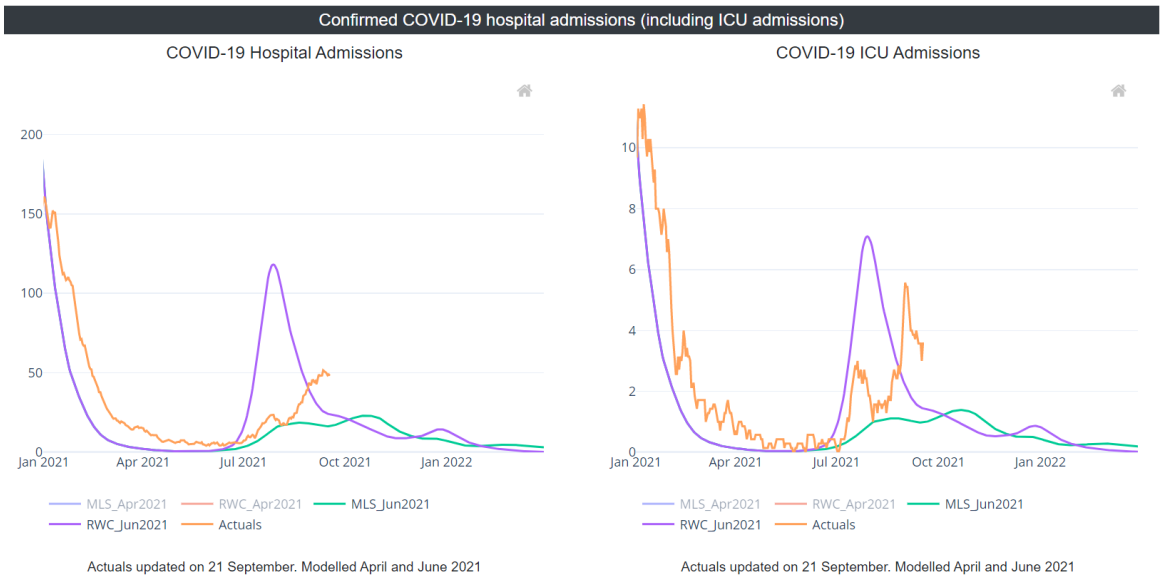
- **Key message:** Following a dip at the end of July 2021, confirmed COVID-19 cases increased until 6 September where another dip occurred. The past few days are starting to show an increase in confirmed COVID-19 cases. Observed levels of confirmed COVID-19 cases, COVID-19 admissions to hospital and ICU, and ICU occupancy are above the levels estimated by the June 2021 reasonable worst case (RWC) scenario. COVID-19 hospital bed occupancy and COVID-19-related deaths are between the most likely scenario (MLS) and the RWC scenario.

- This report compares observed levels of COVID-19 indicators with the June 2021 reasonable worst case (RWC) scenario and most likely scenario (MLS). These scenarios take account of the impact of the Delta variant. These model scenarios are due to be updated imminently to take into account updated assumptions and the move to alert level zero on 7 August 2021.

- In the charts below "RWC_Jun2021" is the current (June 2021) RWC scenario, "MLS_Jun2021" is the current (June 2021) most likely scenario, and "Actuals" represents the actual observed values for each indicator.

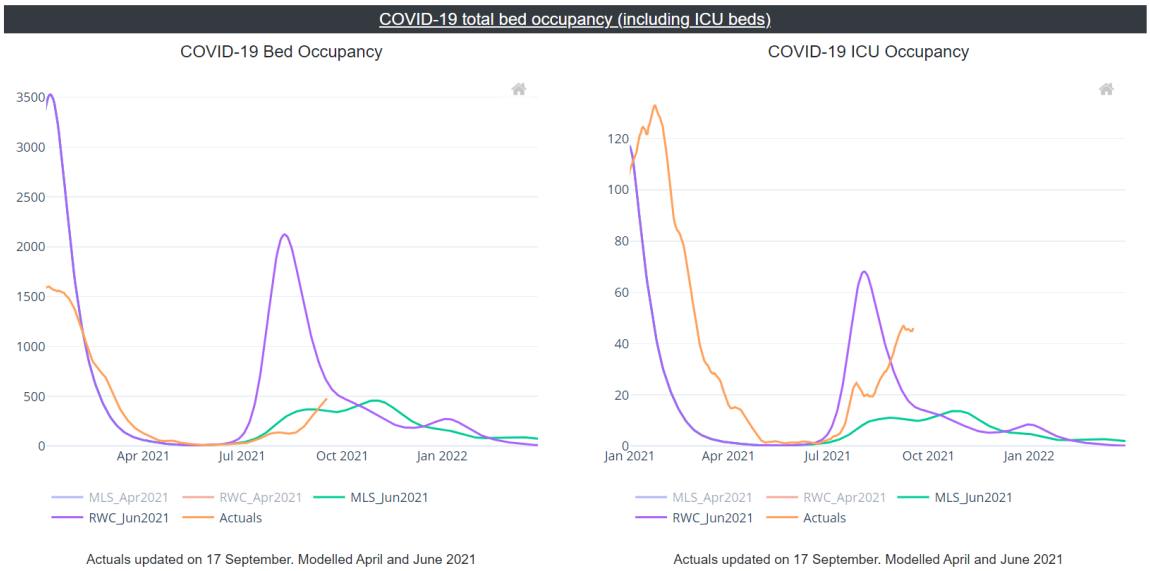



- Confirmed COVID-19 cases were low and stable throughout April and May but started to rise in June 2021. With the exception of a dip in July, confirmed COVID-19 cases rose from June until early September. Recent data show a decrease in confirmed COVID-19 cases since 6 September, but at present it is not possible to tell if this downward trend will continue or if it is a temporary decrease like the one we saw in July. On 15 September, confirmed COVID-19 cases were higher than the MLS and the RWC scenario produced in June 2021. The MLS and RWC scenarios will soon be updated in this chart. Note that for the model scenarios, "Cases" refers to symptomatic cases only so may be an underestimate.



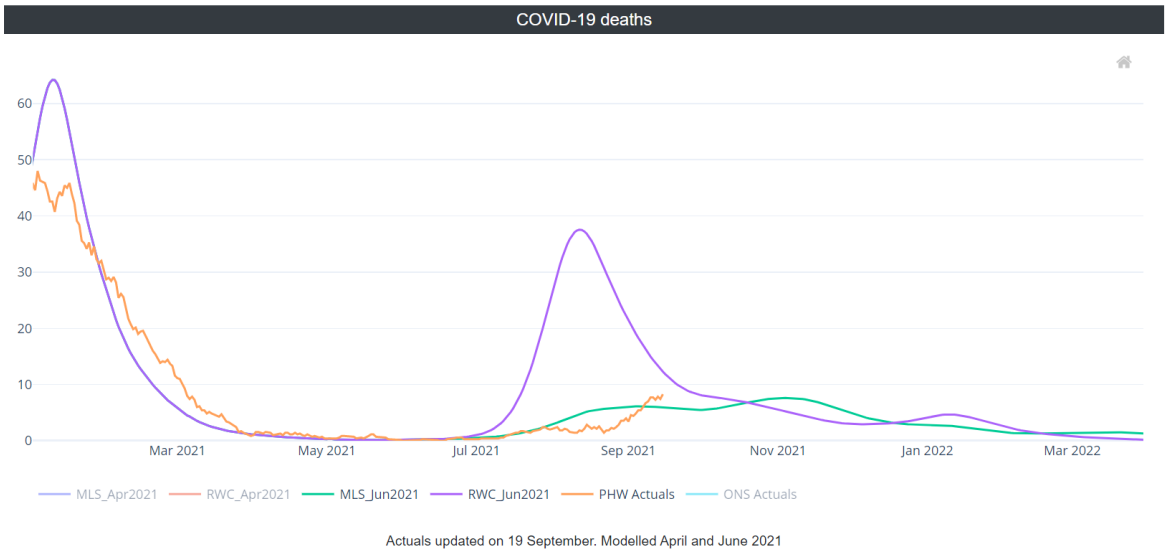

- COVID-19 hospital admissions decreased slowly in May and June 2021 before starting to increase in July. Other than a small dip in early August they have continued increasing since July. On 15 September 2021 the 7-day average for COVID-19 hospital admissions was 48 admissions per day and was higher than the MLS and RWC scenario produced in June 2021. The MLS and RWC scenarios will soon be updated in this chart.

- In May and June 2021 COVID-19 ICU hospital admissions were very low and stable. They rose in early July, reached a peak on 19 July 2021 and then fell almost to the level of the MLS. COVID-19 ICU hospital admissions rose throughout August but fell again in September. On 15 September 2021, the 7-day rolling average for COVID-19 ICU hospital admissions was 3 per day, which is higher than the MLS and RWC scenario produced in June 2021. The MLS and RWC scenarios will soon be updated in this chart.



- COVID-19 confirmed total bed occupancy (which includes ICU beds) was low and stable throughout May and June and started to rise in early July. As of 15 September 2021 the 7-day average for COVID-19 confirmed total bed occupancy was 459 beds occupied by COVID-19 confirmed COVID-19 patients – between the level estimated by the MLS and RWC scenarios produced in June 2021. The MLS and RWC scenarios will soon be updated in this chart.

- Through most of May and June COVID-19 confirmed ICU occupancy was very low at between 1 and 2 per day. It began to rise in early July, about 10 days later than estimated by the RWC, and rose at a rate similar to the RWC. Following a peak on 27 July 2021, COVID-19 confirmed ICU occupancy decreased, but it started to increase again after 11 August 2021. As of 15 September 2021, COVID-19 confirmed ICU occupancy was 45, which is above the MLS and RWC scenario. The MLS and RWC scenarios will soon be updated in this chart.




- COVID-19 deaths were very low between April and mid-July 2021. They have been rising slowly since mid-July. As of 15 September, the 7-day average of COVID-19-related deaths reported by Public Health Wales was a little over 8 per day.

## Public Health Wales: Surveillance of vaccine status in confirmed COVID-19 episodes and hospital inpatients

- **Public Health Wales has published its analysis of confirmed COVID-19 episodes and hospital admissions by vaccine status. This will continue to be routinely updated on the PHW** Rapid COVID-19 virology dashboard.

- The surveillance report summarises the characteristics of patients admitted to hospital who had a COVID-19 positive test result from 28hrs pre-admission to 48hrs post-admission in a 4 week period ending 19 September. 1 in 3 confirmed COVID-19 cases were unvaccinated and 99% of those who tested positive were under 60. Of these, 37% were unvaccinated. Nearly 13% of hospital patients with confirmed Covid were unvaccinated.

- Data on the reasons for admission were not available for this report and likely reflect both admissions due to COVID-19 and admissions for other reasons with COVID-19. NHS England are able to collect this data (link- *Primary Diagnosis Supplement*), which suggests around 75% of COVID-19 admissions are with a primary COVID-19 diagnosis, although it is uncertain how comparable this is to NHS-Wales admissions. This is currently being explored in Wales.

- In the context of very high vaccine coverage in the population, even with a highly effective vaccine, it is expected that a large proportion of cases would occur in vaccinated individuals, simply because a larger proportion of the population are vaccinated than unvaccinated and vaccines are not 100% effective. This may be even more notable if vaccination has been prioritised to individuals who are more susceptible or more at risk of severe disease, as in the COVID-19 vaccination programme, in particular when looking at severe disease outcomes such as hospitalisations or deaths. Individuals in risk groups prioritised for vaccination may also be more at risk of hospitalisation or death from non-COVID-19 causes, and thus may be hospitalised or die *with* COVID-19 rather than *because* of COVID-19.

- The most recent estimates of vaccine effectiveness are available here, suggesting 95% vaccine effectiveness against hospitalisation or death with two doses of the AstraZeneca or Pfizer-BioNTech vaccines.

- Full surveillance report: Survey of vaccine status in cases and hospital inpatients.pdf (wales.nhs.uk) Source: Rapid COVID-19 virology - Public | Tableau Public

## COVID-19 evidence - round-up

### First work programme of the Wales COVID-19 Evidence Centre helps to address new challenges faced by the NHS and social care

- The Welsh Government's £3m Wales COVID-19 Evidence Centre has been analysing 17 different research priorities since its creation six months ago, providing crucial scientific evidence to help health and care services tackle new challenges created by the pandemic.

- Its work programme has so far included a review of research on the impact on the mental health of health and social care workers in the UK; infection prevention in schools and education settings; vaccination uptake in adults from underserved communities, tackling cancer investigation backlogs; and the effectiveness of face coverings.

- The Wales COVID-19 Evidence Centre, which is part of Health and Care Research Wales, enables rapid access to key international research findings and allows fast and focused research studies to be undertaken at a Wales level to guide decision-making by ministers as well as leaders in the NHS and social care.

- The full work programme including published reviews to date can be found on the Health and Care Research Wales website.

**PHW: Enhanced surveillance for influenza and other acute respiratory infections – 16 September**

- Respiratory Syncytial Virus (RSV) is a very common virus and almost all children are infected with it by the time they are 2 years old. In older children and adults, RSV may cause a cough or cold, but in young children it can cause bronchiolitis, resulting in problems with breathing and feeding.

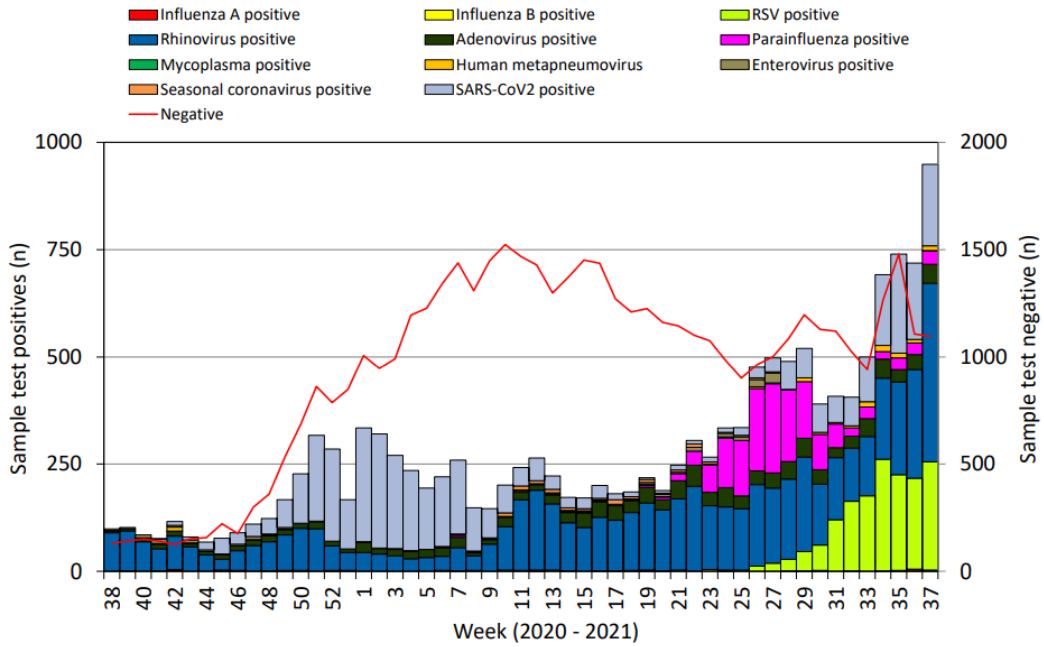
- During Week 37 (ending 23 September) there has been an increase in the number of confirmed cases of Respiratory Syncytial Virus (RSV) in children aged under 5 years across Wales to 184.5 confirmed cases per 100,000 (see below graph). The provisional Moving Epidemic Method threshold in Wales, which predicts the start of the annual RSV season in children younger than five years, is 6.3 per 100,000.

- This week incidence of confirmed RSV cases has increased and remains above the threshold that would normally indicate very high intensity seasonal activity, although testing levels are also higher currently than in previous seasons. RSV did not circulate over the 2020-21 winter. The current increase in cases is earlier than the usual RSV season in Wales and it is unclear whether it will follow the usual epidemic pattern for RSV.

- The current level of influenza activity is at baseline and trends appear stable. Six influenza cases were confirmed during week 37. COVID-19 cases continue to be detected in symptomatic patients in hospital and in the community. RSV and rhinovirus are the most commonly detected cause of non-COVID-19 Acute Respiratory Infection (ARI).

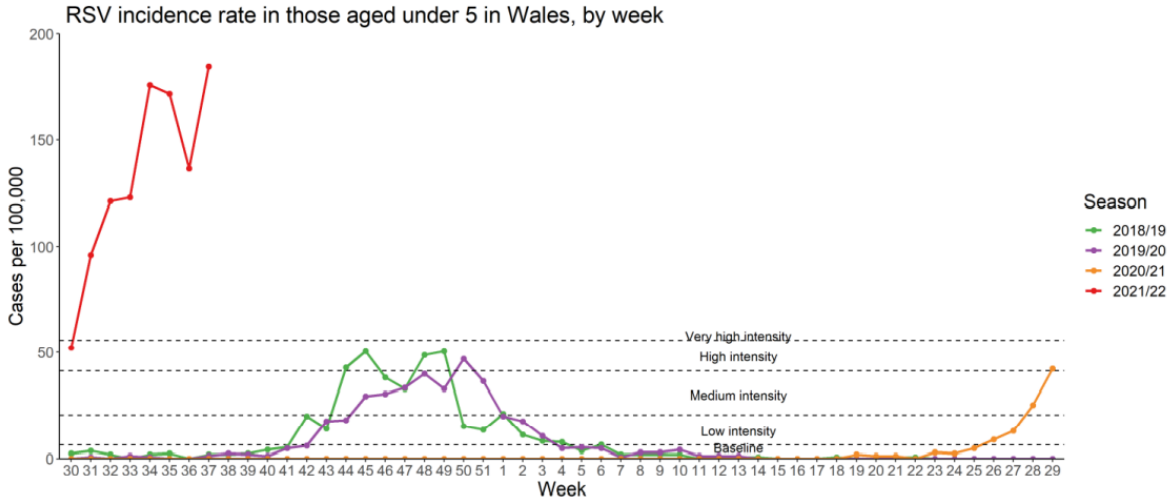
- At a UK level the majority of community and syndromic influenza indicators have remained well below baseline intensity thresholds across the four nations. The WHO and CDC have reported that during weeks 33-36 influenza activity remained at inter-seasonal levels across the WHO European Region.

**Figure 4. Specimens submitted for virological testing for hospital patients and non-sentinel GPs as of 19/09/2021 by week of sample collection, week 38 2020 to Week 37 2021.**




This chart summarises respiratory panel test data and does not include data for patients tested SOLEY for SARS-CoV2. Combined data for tests carried o in Public Health Wales Microbiology: Cardiff laboratory, provided by Public Health Wales Microbiology Cardiff Specialist Virology Centre. This chart summarises individual test results, patients who are positive for multiple infections within a given week will appear multiple times.

**Figure 7. RSV incidence rate per 100,000 population aged under five years, week 30 2017 to Week 37 2021.**




- Full paper: [Public Health Wales Health Protection Division - Weekly Influenza and Acute Respiratory Infection Report]

**ONS: Coronavirus (COVID-19) Infection Survey technical article: analysis of populations in the UK by risk of testing positive for COVID-19, September 2021**

- The ONS has published their analysis of populations in the UK by risk of testing positive for COVID-19 from the Coronavirus (COVID-19) Infection Survey. This survey is being delivered in partnership with University of Oxford, University of Manchester, Public Health England and Wellcome Trust.
- This technical article presents the methods and results of analysis to identify characteristics of people who are more likely to test positive for coronavirus (COVID-19) in specific periods of time. It screens the different characteristics of people sampled in the Coronavirus (COVID-19) Infection Survey (CIS) who have and have not tested positive and uses a statistical model to assign risk to each of these characteristics.
- The analysis is based on three regression models which identify the characteristics that have the greatest effect on the likelihood of testing positive for COVID-19. The three models systematically build up from the first model. This approach enables us to isolate the effects of specific characteristics and behaviours which increase the risk of an individual testing positive. The models were fit at the UK level and cover all ages included in the survey (two years and over).
- Key findings:
    - The largest difference in risk was between people of different vaccination status. People who had received one or two doses of a coronavirus vaccine were less likely to test positive for coronavirus (COVID-19) in the fortnight ending 11 September 2021 (between 1/7 and 1/2 comparative risk with unvaccinated- see below image).
    - People who had had coronavirus (COVID-19) previously (had a positive swab in the survey or the England Test and Trace programme more than 120 days ago) were less likely to test positive for COVID-19 than those with no previous COVID-19 infection.
    - People living in a household of three or more occupants were more likely to test positive for COVID-19 in the fortnight ending 11 September 2021.
    - People living in less deprived areas were less likely to test positive for COVID-19 than those in more deprived areas.
    - Those in younger age groups were more likely to test positive for COVID-19 in the fortnight ending 11 September 2021.
    - People who never wore a face covering in enclosed spaces were more likely to test positive for COVID-19 in the fortnight ending 11 September 2021.
    - Those who reported socially distanced contact with 11 or more people aged 18 to 69 years outside their household were more likely to test positive for COVID-19, in the fortnight ending 11 September 2021.
    - People taking regular lateral flow tests were more likely to test positive for COVID-19 than individuals who do not. This has been seen consistently since 14 March 2021. Regular lateral flow tests are recommended for

people whose work or other factors put them at high risk of getting COVID-19. Therefore, this association may reflect this underlying risk.

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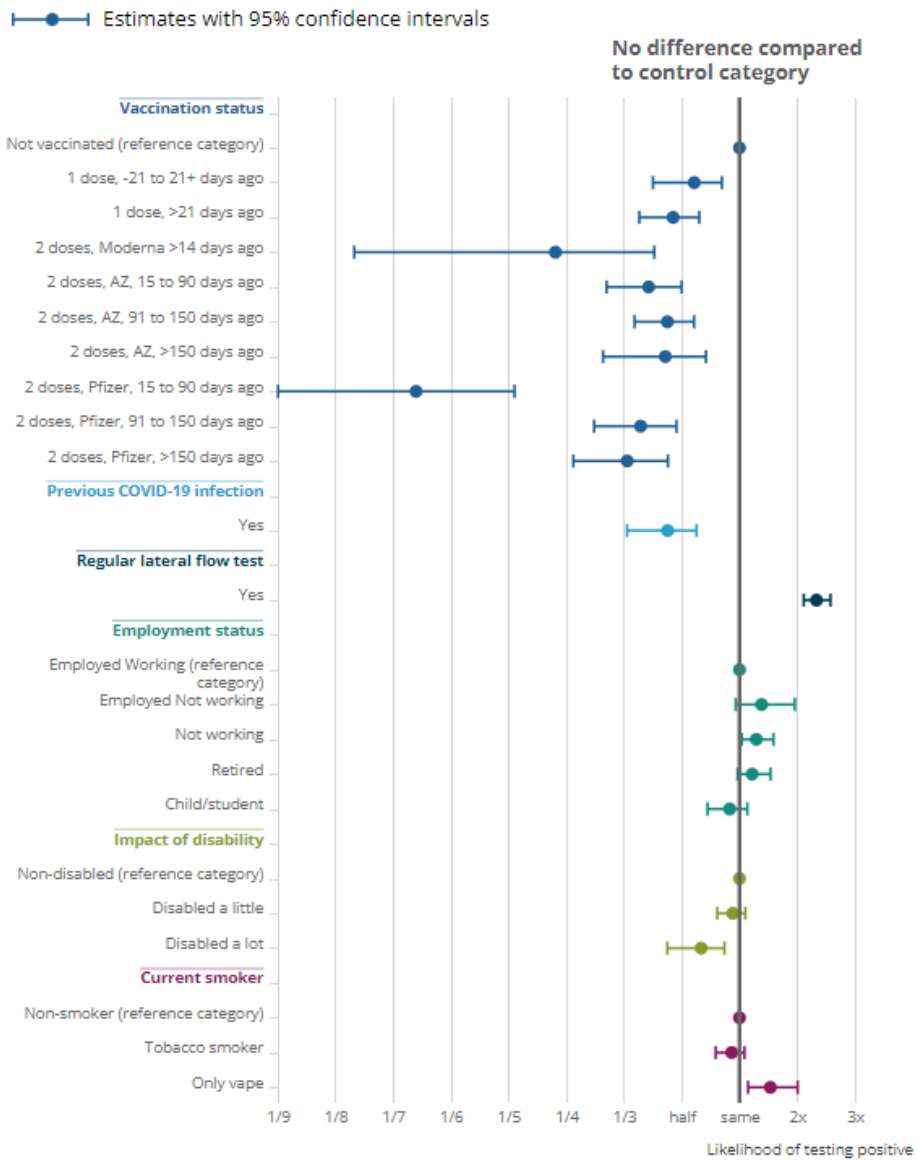
**The likelihood of testing positive for coronavirus (COVID-19) on nose and throat swabs by screened characteristic, UK, 29 August to 11 September 2021**




- Full report: [Coronavirus (COVID-19) Infection Survey technical article - Office for National Statistics]

**NEJM- Receipt of mRNA Covid-19 Vaccines and Risk of Spontaneous Abortion (miscarriage)**

- A study has been submitted to the New England Journal of Medicine's correspondence section from the CDC v-safe Covid-19 vaccine pregnancy registry team, looking to estimate the risk of spontaneous abortion, or miscarriage, between 6 and 20 weeks following receipt of an mRNA vaccine by calculating the cumulative risk of spontaneous abortion according to gestational week.

- A total of 2,456 participants who received an mRNA Covid-19 vaccination either before conception or during pregnancy were included, the majority of whom were 30 years or older, white and worked as health care personnel. The report concludes that the risk of spontaneous abortion after mRNA Covid-19 vaccination either before conception or during pregnancy is consistent with the expected risk in general literature, meaning no increased risk.

- Limitations of the study include the lack of a control group of unvaccinated pregnant persons, the homogeneity of the participants in terms of racial and ethnic groups and occupation, the use of voluntary participants, and the use of self-reported data, including some data collected retrospectively. However, these findings add to the accumulating evidence about the safety of mRNA Covid-19 vaccination in pregnancy.

- Full paper: Preliminary Findings of mRNA Covid-19 Vaccine Safety in Pregnant Persons | NEJM

**Lancet - Daily testing for contacts of individuals with SARS-CoV-2 infection and attendance and SARS-CoV-2 transmission in English secondary schools and colleges: an open-label, cluster-randomised trial**

- A key indirect harm of the pandemic for young people that could have a long-term impact has been missed learning as a result of self-isolation due to school-based COVID-19 contacts. Currently, PCR testing of close contacts of confirmed cases is not mandatory in Wales (although it is recommended) and as long as a child does not suffer from the 3 core symptoms (a new continuous cough, a fever or high temperature or loss of/ change in sense of smell or taste) they are permitted to continue attending school.

- A randomised control trial study published in the lancet trialled daily LFD testing of contacts as a voluntary alternative to 10 days of self-isolation to assess whether this resulted in increased levels of transmission, while allowing more school attendance, finding this was not the case. The study, which included 200 secondary schools and further education colleges in England split into a control and intervention group, ran between April 19 and June 27 2021, a period of low community incidence when infection rates in schools were low.

- Overall, this study shows that in secondary schools and further education colleges, switching from isolation at home to daily contact testing, at least in the

settings of the schools studied, kept rates of symptomatic COVID-19 in students and staff at similar levels in the schools involved in the study (around 2%). Daily contact testing appears to be a safe alternative to home isolation in school-based close contacts and could be considered an alternative to routine isolation following school-based exposures.

- The findings have implications for policy makers seeking to balance control of COVID-19 with student wellbeing, education, and avoiding social inequalities, highlighting daily contact testing as a safe alternative to home isolation for school-based contacts. This has the potential to facilitate increased school attendance and therefore to reduce the wider long-term negative consequences of the pandemic.

- The authors highlight several limitations of the study, such as imperfect data capture of testing and contacts, partly due to occasionally limited resources a reliance on data linkage with test and trace, as well as the fact the trial was done during a period of low incidence and therefore did not consider the impact of daily contact testing in high incidence settings. It is suggested that high incidence may pose a number of logistical challenges and this was highlighted in the last 2 weeks of the study when community incidence increased, making the daily contact testing protocol difficult in some schools given the space and staff resource required to continue testing.

- Full paper: Daily testing for contacts of individuals with SARS-CoV-2 infection and attendance and SARS-CoV-2 transmission in English secondary schools and colleges: an open-label, cluster-randomised trial - The Lancet

**ONS Technical Report: Updated estimates of the prevalence of Long-COVID among people with coronavirus (COVID-19) in the UK: 26 April 2020 to 1 August 2021**

- The ONS has released a report providing experimental estimates from three approaches to estimating the percentage of people testing positive for COVID-19 who experience symptoms four and twelve or more weeks after infection, broken down by demographic and symptom status.

- This work highlights the different ways in which the prevalence and impact of Long Covid can be assessed and that, using some methods, prevalence may be lower than originally estimated.

- Released as a 'technical report' due to its complexity and experimental status, the report emphasises the importance of clear definitions when assessing long-term symptoms in people who previous have had COVID-19. The three estimates produced by the different approaches, in order of decreasing size, are:

    1. Prevalence of self-reported Long COVID (**11.7% after 12 weeks**, 7.5% for symptoms that impacted daily activities)

    2. Prevalence of any of 12 COVID-associated symptoms at any time after infection (**5.0% after 12 weeks**)

3. Prevalence of continuous symptoms after infection (**3.0% after 12 weeks**)

- Taken together, these show that between 3% and 11.7% of people infected with coronavirus have symptoms 12 weeks after the initial infection; or between 6.7% and 17.7% when considering only people who were symptomatic at the acute phase of infection.

- These results are based on self-reported data provided by a sample of over 20,000 Coronavirus Infection Survey (CIS) participants. The analysis is not intended to be scaled up to the broader population to estimate the total number of long COVID cases there could be in the population and this is not discussed in the paper, although this is considered in another ONS report from early September. That report suggested that as many as 643,000 people across the UK could be experiencing activity-limiting post-COVID symptoms, with 188,000 (29%) of this reporting their activities are 'limited a lot', based on self-reported survey data.

- The ONS also helpfully contextualises this analysis in comparison with other long COVID studies, which have resulted in a wide range of estimates due to each study having its own long COVID definition, study population and design, data collection instrument and statistical methodology.

- Full statement: Technical article: Updated estimates of the prevalence of post-acute symptoms among people with coronavirus (COVID-19) in the UK - Office for National Statistics (ons.gov.uk)

- Accompanying ONS Blog: How common is long COVID? That depends on how you measure it | National Statistical (ons.gov.uk)

**ONS: Deaths involving COVID-19 by vaccination status, England: deaths occurring between 2 January and 2 July 2021**

- An ONS analysis of age-standardised deaths involving COVID-19 by vaccination status confirms that the risk of death involving COVID-19 was consistently lower for people who had received two vaccinations, as shown by the weekly age-standardised mortality rates (ASMRs) for deaths involving COVID-19.

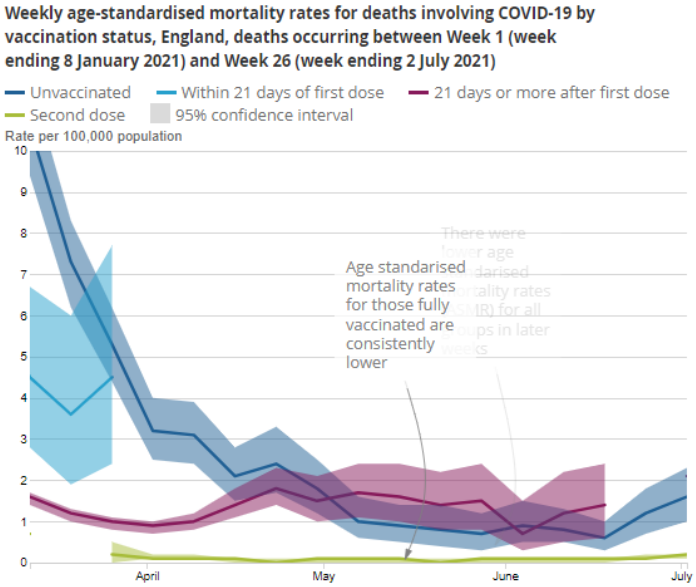
- Of 51,281 deaths involving COVID-19 between 2 January and 2 July 2021, 38,964 were unvaccinated and 640 occurred in people who were fully vaccinated, including those who had been infected prior to vaccination or received a second dose less than 21 days prior to death. The median age of breakthrough deaths was 84, compared to 82 for other COVID-19 deaths and for non-COVID-19 deaths.

- There were 256 'breakthrough deaths' between 2 January and 2 July (i.e. a death involving COVID-19 that occurred in someone who had received both vaccine doses and had a first positive PCR test at least 14 days after the second vaccination dose). 76.6% of breakthrough deaths occurred in the clinically extremely vulnerable group. Some deaths are expected in vaccinated individuals

as the number of people who are vaccinated is high and no vaccine is 100% effective.

- 61.1% of breakthrough deaths occurred in males, compared to 52.2% and 48.5% for other COVID-19 deaths and for non-COVID-19 deaths respectively; the median age of breakthrough deaths was 84, compared to 82 for other COVID-19 deaths and for non-COVID-19 deaths.

- 13.1% of breakthrough deaths occurred in people who were identified as likely to be immunocompromised from hospital episodes or causes of death, compared to 5.4% for other COVID-19 deaths.




- Full statement: [Deaths involving COVID-19 by vaccination status, England - Office for National Statistics]

## Cell: COVID-19 vaccines: Keeping pace with SARS-CoV-2 variants

- A commentary article published in the journal Cell summarises the available data on variants of concern and their impact on the effectiveness provided by current vaccines.

- While the virus will continue to produce mutations promoting immune evasion, vaccine induced immunity may be the best way to counter this. As a result monitoring variants and the global distribution of COVID-19 vaccines will be crucial in managing this stage of the pandemic.

- When considering vaccine effectiveness against new variants, there are at least three elements to consider: (1) whether antibodies triggered by current vaccines can recognize and neutralize these new variants, (2) whether there are cross-reactive cellular immune responses to these variants, and (3), most importantly, the real-world impact of variants on the clinical protection provided by vaccines.

- The emerging evidence supports the importance of neutralizing antibodies for preventing infection, demonstrating an association between neutralizing antibody levels and breakthrough infections. However, neutralizing antibodies are likely not the only mechanism of protection, and T cells and non-neutralizing antibodies are likely also playing a significant role especially in regard to protection against symptomatic infection and severe disease. For instance, T cells appear to be the major contributors to controlling SARS-CoV-2 infection.

- Vaccines can also elicit cross-protective B and T cell responses, which has been found for the Pfizer-BioNTech and Moderna mRNA. Importantly, B and T cells can recognize different SARS-CoV-2 variants and are minimally affected by S mutations. In addition, current evidence suggests that Alpha and Beta do not escape T cell responses induced by vaccines. Therefore, despite reduced antibody titers against some of these variants, vaccine-induced immunity will likely be conserved against currently circulating variants, supported by clinical data.

- The evidence so far suggests that effectiveness against hospitalizations and symptomatic illness is highly preserved against Delta based on data from England, Scotland, Canada, Qatar, Israel, and the United States.

- Although the preliminary data published by the Ministry of Health in Israel caused much concern suggesting a significant decline of effectiveness against symptomatic Delta infection, further preprint published did not report effectiveness figures against symptomatic infection as symptoms reporting was not reliable in the national database. Vaccine effectiveness against infection is much harder to measure as these estimates are affected by various biases such as testing criteria, behaviour, exposure risk, immunity status of the population, and community prevalence. Studies showed an estimated 55%–80% effectiveness against infection before Delta was dominant, and there is a modest decline seen in prevention against infection with Delta.

- Full article: COVID-19 vaccines: Keeping pace with SARS-CoV-2 variants: Cell

**BMJ: Risk of hospital admission with covid-19 among teachers compared with healthcare workers and other adults of working age in Scotland, March 2020 to July 2021: population based case-control study**

- A study examining the risk of hospital admission with covid-19 and severe covid-19 among teachers and their household members, overall and compared with healthcare workers and adults of working age in the general population has been published in the BMJ. They study consider Scottish schools between March and July 2021 during defined periods of schools closures and full reopening.

- All cases of covid-19 in adults aged 21 to 65 (n=132, 420) and a random sample of controls matched on age, sex, and general practice (n=1, 306,566). Adults were identified as actively teaching in a Scottish school by the General Teaching Council for Scotland, and their household members were identified through the unique property reference number.

- The primary outcome being measured was hospital admission with covid-19, defined as having a positive test result for SARS-CoV-2 during hospital admission, being admitted to hospital within 28 days of a positive test result, or receiving a diagnosis of covid-19 on discharge from hospital. Severe covid-19 was defined as being admitted to intensive care or dying within 28 days of a positive test result or assigned covid-19 as a cause of death.

- Most teachers were young (mean age 42), were women (80%), and had no comorbidities (84%). The risk (cumulative incidence) of hospital admission with covid-19 was <1% for all adults of working age in the general population. Over the study period, teachers showed a lower risk of hospital admission with covid-19 than the general population. In the first period when schools in Scotland reopened, in autumn 2020, the rate ratio for hospital admission in teachers was 1.20 (95% Confidence Interval: 0.89 to 1.61) and for severe covid-19 was 0.45 (0.13 to 1.55). The corresponding findings for household members of teachers were 0.91 (0.67 to 1.23) and 0.73 (0.37 to 1.44), and for patient facing healthcare workers were 2.08 (1.73 to 2.50) and 2.26 (1.43 to 3.59). Similar risks were seen for teachers in the second period, when schools reopened in summer 2021. These values were higher than those seen in spring/summer 2020, when schools were mostly closed.

- The report highlights other studies of the risk of COVID-19 among adults working with teacher; with a Norwegian study suggesting higher risk in preschool teachers, lower in primary school teachers and little difference in secondary school teachers to the general population, although confidence intervals were wide.

- In Sweden, where schools remained mostly open, lower secondary school teachers (who taught in person) were compared with upper secondary school teachers (who did not). On adjusting for age, sex, income, and region, the relative risks for hospital admission and death with covid-19, testing positive for SARS-CoV-2, and diagnosis of covid-19, were around twofold higher in the teachers in lower secondary school than those in upper secondary school. However, an increased risk was not consistently found in other analyses compared with non-teaching occupations

- In the UK, the Office for National Statistics examined deaths associated with covid-19 from 9 March 2020 to 28 December 2020 and found that teaching and educational professionals had lower age standardised mortality than all residents of England and Wales aged 20 to 64 years, both among men and among women. Mortality data covering a longer period in Scotland (1 March 2020 to 30 June 2021) shows a lower age standardised mortality for teaching and education professionals of 7.1 per 100 000 (95% confidence interval 2.7 to 11.6 per 100 000), with this grouped ranked 19 out of 20 occupational groups with a rate calculated.

  Overall, compared with adults of working age in the general population, this study suggests teachers were not at increased risk of hospital admission with COVID-19 and were at lower risk of severe COVID-19 during a period when schools were open, vaccine uptake was high among teachers, the delta variant was dominant, and a large surge in cases occurred. In contrast, the risk of hospital

admission with covid-19 was found to be higher among patient facing healthcare workers and their household members. Non-patient facing healthcare workers, as with teachers, were not observed to be at increased risk compared with adults of working age in the general population.

- Full paper: Risk of hospital admission with covid-19 among teachers compared with healthcare workers and other adults of working age in Scotland, March 2020 to July 2021: population based case-control study | The BMJ

**BMJ: Risk prediction of covid-19 related death and hospital admission in adults after covid-19 vaccination: national prospective cohort study**

- A study aimed at estimating the risk of covid-19 related mortality and hospital admission in UK adults after one or two doses of covid-19 vaccination has been published in the BMJ. The study design was a prospective, population based cohort study using the QResearch database linked to data on covid-19 vaccination, SARS-CoV-2 results, hospital admissions, systemic anticancer treatment, radiotherapy, and the national death and cancer registries. The scope of the study was adults aged 19-100 years with one or two doses of covid-19 vaccination between 8 December 2020 and 15 June 2021.

- Of 6,952,440 vaccinated patients in the derivation cohort, 5,150,310 (74.1%) were fully vaccinated (2 doses). Of 2,031 covid-19 deaths and 1,929 covid-19 hospital admissions, 81 deaths (4.0%) and 71 admissions (3.7%) occurred 14 days or more after the second vaccine dose. The risk algorithms included age, sex, ethnic origin, deprivation, body mass index, a range of comorbidities, and SARS-CoV-2 infection rate. Incidence of covid-19 mortality increased with age and deprivation, male sex, and Indian and Pakistani ethnic origin.

- Cause specific hazard ratios were highest for patients with Down's syndrome (12.7-fold increase), kidney transplantation (8.1-fold), sickle cell disease (7.7-fold), care home residency (4.1-fold), chemotherapy (4.3-fold), HIV/AIDS (3.3-fold), liver cirrhosis (3.0-fold), neurological conditions (2.6-fold), recent bone marrow transplantation or a solid organ transplantation ever (2.5-fold), dementia (2.2-fold), and Parkinson's disease (2.2-fold). Other conditions with increased risk (ranging from 1.2-fold to 2.0-fold increases) included chronic kidney disease, blood cancer, epilepsy, chronic obstructive pulmonary disease, coronary heart disease, stroke, atrial fibrillation, heart failure, thromboembolism, peripheral vascular disease, and type 2 diabetes. A similar pattern of associations was seen for covid-19 related hospital admissions.

- No evidence indicated that associations differed after the second dose, although absolute risks were reduced. The risk algorithm explained 74.1% (95% confidence interval 71.1% to 77.0%) of the variation in time to covid-19 death in the validation cohort.

- The ability of the model to discriminate outcomes between individuals was high, and a calibration model of 92.5 suggests the model accurately predicted overall observed outcomes. In the top 5% of patients with the highest predicted covid-19

mortality risk, sensitivity for identifying covid-19 deaths within 70 days was 78.7%.

- Overall this population based risk algorithm performed well showing high levels of discrimination for identifying those patients at highest risk of covid-19 related death and hospital admission after vaccination. It identified a range of important clinical risk factors for severe covid-19 outcomes in people in the UK, 14 days or more after covid-19 vaccination (first or second dose) when some immunity is expected to have developed.

- Full statement: Risk prediction of covid-19 related death and hospital admission in adults after covid-19 vaccination: national prospective cohort study | The BMJ

**CDC: Outbreak of SARS-CoV-2 B.1.617.2 (Delta) Variant Infections Among Incarcerated Persons in a Federal Prison — Texas, July–August 2021**

- Incarcerated populations have experienced higher rates of COVID-19–related illness and death, largely due to their status as a high density population in a closed setting. A report published by the Center for Disease Control in the US highlights a large COVID-19 outbreak involving the Delta variant in a highly vaccinated incarcerated population in July 2021. During this outbreak, transmission rates were high, even among vaccinated persons. Almost three fourths of incarcerated persons were infected over the course of the outbreak, despite 79% vaccination coverage.

- Before the outbreak, incarcerated persons moved freely between units A and B and were together for meals, recreation, and work; they did not have contact with incarcerated persons housed in other units. Records indicate that nearly two thirds of staff members in this prison were unvaccinated, and at least nine were infected during this outbreak. In addition, during the 2 weeks before the outbreak, community transmission was high. SARS-CoV-2 can be introduced into correctional facility populations and back into the community through daily entry and exit of staff members and inter-facility transfers of incarcerated persons, and the identification of a single viral lineage among all sequenced specimens in this outbreak suggests a single introduction of the virus into the prison.

- Although secondary rates and severe outcomes such as hospitalisation and death were reduced among the vaccinated population, duration of viral shedding in symptomatic vaccinated and unvaccinated individuals was similar and infectious virus was cultured from both.

- The attack rate was higher among unvaccinated versus fully vaccinated persons (39 of 42, 93% versus 129 of 185, 70%; $p = 0.002$)

- There were also indications that double vaccination with prior COVID-19 infection provided more robust protection against infection, although sample sizes were small. However for those without prior infection there was limited protection against infection

- Overall the study recommends that while vaccination is important to reduce serious COVID-19 related illness and death; even with high vaccination rates maintaining multicomponent prevention strategies (e.g., testing and masking for all persons and prompt medical isolation and quarantine for incarcerated persons) remains critical to limiting SARS-CoV-2 transmission in congregate settings where physical distancing is challenging.

- Full paper: Outbreak of SARS-CoV-2 B.1.617.2 (Delta) Variant Infections Among Incarcerated Persons in a Federal Prison — Texas, July–August 2021 | MMWR (cdc.gov)