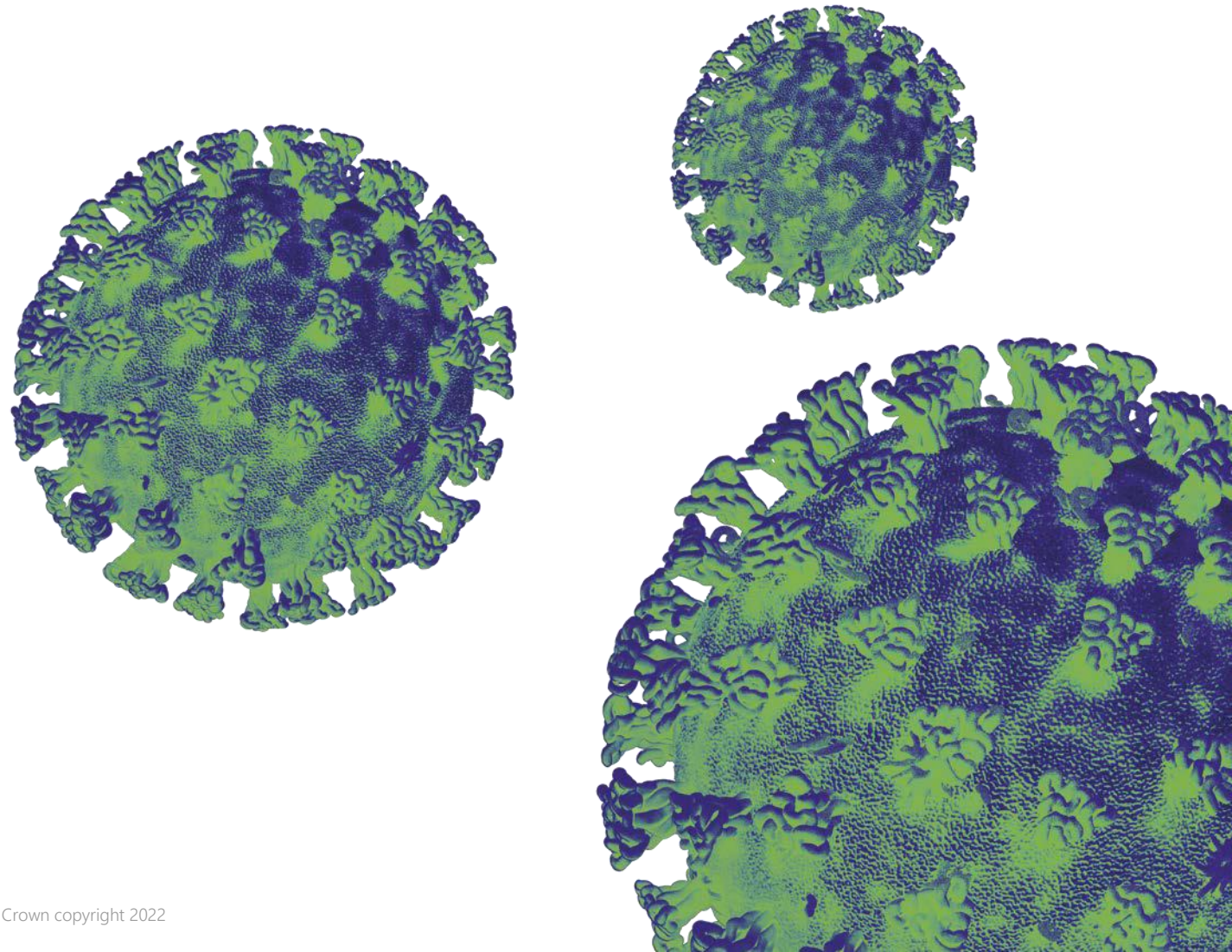
Llywodraeth Cymru
Welsh Government

Technical Advisory Cell

Summary of Advice

1 June 2022

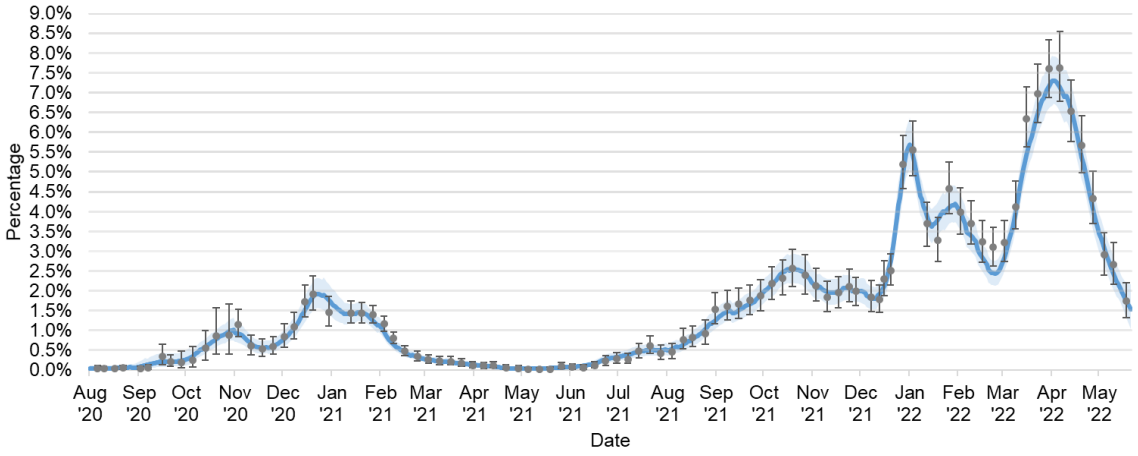


Technical Advisory Cell: COVID-19 Summary of Advice

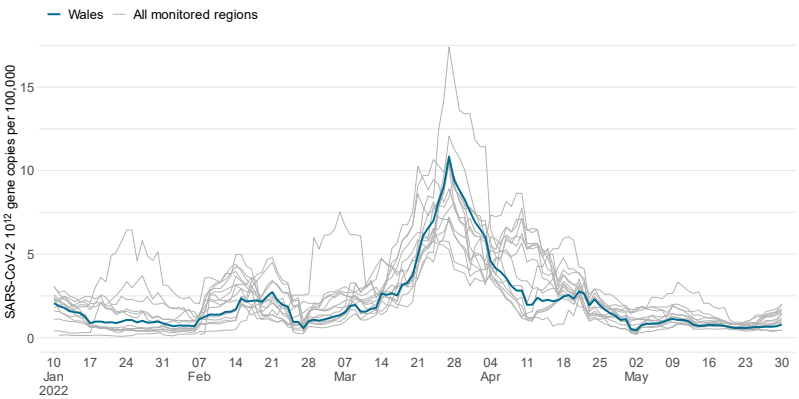
1 June 2022

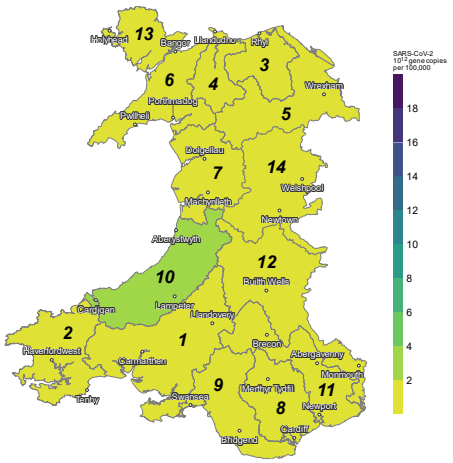
Wales Sitrep

Recent reporting from the ONS COVID Infection Survey, which provides a relatively unbiased but lagged estimate of levels of infection, estimates for the period 21 to 27 May 2022, 1.30% of the community population had COVID-19 (95% credible interval: 0.97% to 1.17%). This equates to approximately 1 person in every 75 (95% credible interval: 1 in 100 to 1 in 60), or 39,600 people during this time (95% credible interval: 29,400 to 52,000. Overall the percentage of people testing positive for COVID-19 in Wales continued to decrease in the most recent week. Caution should be taken in over-interpreting any small movements in the latest trend.



- Wastewater surveillance dated 1 June 2022 suggests that the SARS-CoV-2 viral load has increased across the country. However, the signal has remained level at the South East Valleys and Tawe to Cadoxton regions. The trends in the national mean wastewater signal are unstable.





- As at 27 May, NHS Wales remains under considerable pressure, although the COVID-19 situation continues to improve compared to the previous week. The total number of COVID related patients in hospital beds today is 582, 112 (16%) lower than the same day last week and the lowest it has been since 28 December 2021. The number confirmed COVID patients in hospital has improved with 182 patients currently

occupying a bed, 61 lower than the same day last week and the lowest since 22 August 2021.

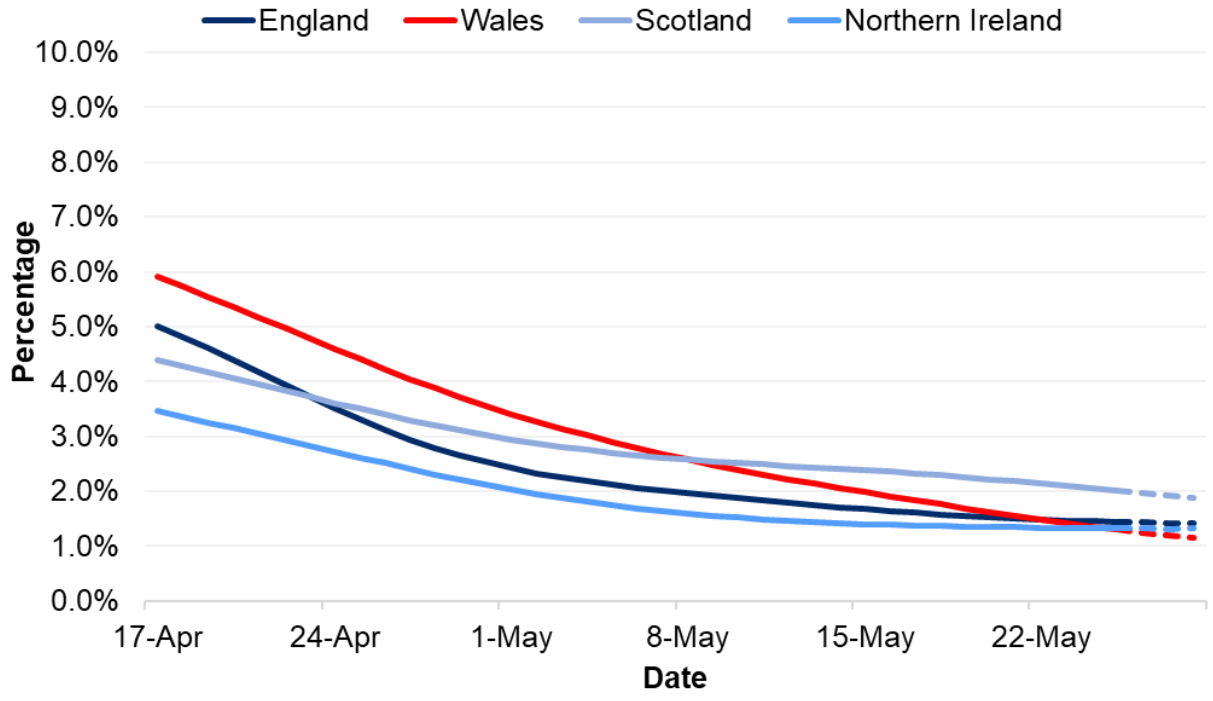
- The number of occupied surge and normal beds in a critical care environment is 166, 14 higher than the pre-COVID baseline of 152 for critical care beds and 16 lower than the same day last week.
- The number of COVID related patients in critical care today was 7, three lower than the same day last week.
- Today's data showed that of the 144 confirmed COVID patients in an acute and major acute hospital bed (excluding Velindre), 19 patients (13%) are actively being treated for COVID.
- As at 25 May 2022, deaths in confirmed COVID-19 cases in hospital, reported by clinicians through PHW mortality rapid surveillance, increased within March 2022 (although at lower levels compared to previous waves). In recent weeks reported deaths have reduced and are more stable, with 19 deaths reported in the most recent week. In deaths where information is available from PHW rapid mortality surveillance, chronic heart disease, Type 2 diabetes and chronic respiratory disease are the most commonly reported risk factors (in 34%, 27% and 22% of deaths respectively).
- Lagged ONS death registration reporting up to 20 May shows the total number of deaths registered in Wales was 720; 12 lower than the previous week and 14.1% above the five-year average (89 more deaths). 2.5% of total deaths involved COVID-19 (18 deaths).
- As at 25 May, 34 adult care homes in Wales have notified CIW of one or more confirmed cases of COVID-19, in staff or residents, in the last 7 days. 103 adult care homes in Wales have notified CIW of one or more confirmed cases of COVID-19, in staff or residents, in the last 20 days. There are 1,033 adult care homes and 17 adult and child care homes in Wales. In the last two weeks, there have been 8 reported deaths of care home residents relating to suspected or confirmed COVID-19. (Source: StatsWales).
- As at 25 May 2022, UKHSA's Epidemiology Modelling Review group estimate the Reproduction number (Rt) for Wales to be between 0.7 and 9, with a halving time of 19 to 19 days.
- PHW report that confirmed influenza case numbers have increased during April, and include a number of community cases confirmed in sentinel GPs. **This is later than usual seasonal activity, at low levels**. During Week 20 (ending 22/05/2022) there were 28 cases of influenza confirmed. COVID-19 cases continue to be detected in symptomatic patients in hospital and in the community. Rhinovirus and parainfluenza are the most commonly detected cause of non-COVID-19 Acute Respiratory Infection (ARI), with increasing confirmed cases in recent weeks. There has been a small decrease in confirmed cases of RSV activity, this unseasonal activity is currently at low levels.

UK Summary

UK Infection positivity – ONS Coronavirus Infection Survey, 22 to 28 May 2022

- During the most recent period, it is estimated that an average of 39,600 people in Wales had COVID-19 (29,400 to 52,000) equating to 1 in 75 people (1 in 100 to 1 in 60). This compares to 1 in 70 people in England (1 in 75 to 1 in 65), around 1 in 75 people (1 in 110 to 1 in 55) in Northern Ireland and 1 in 50 people (1 in 60 to 1 in 40) in Scotland..
- The percentage of people testing positive for COVID-19 has decreased in the latest week in Wales, England and Scotland, the trend is uncertain in Northern Ireland.
- Note that there is uncertainty around the estimates and credible intervals are provided in the figures above to indicate the range within which we may be confident the true figure lies. Since the estimates are based on a relatively low number of positive tests, there is some uncertainty and the results should be interpreted with caution.

Positivity rates (%) across UK countries since 17 April 2022

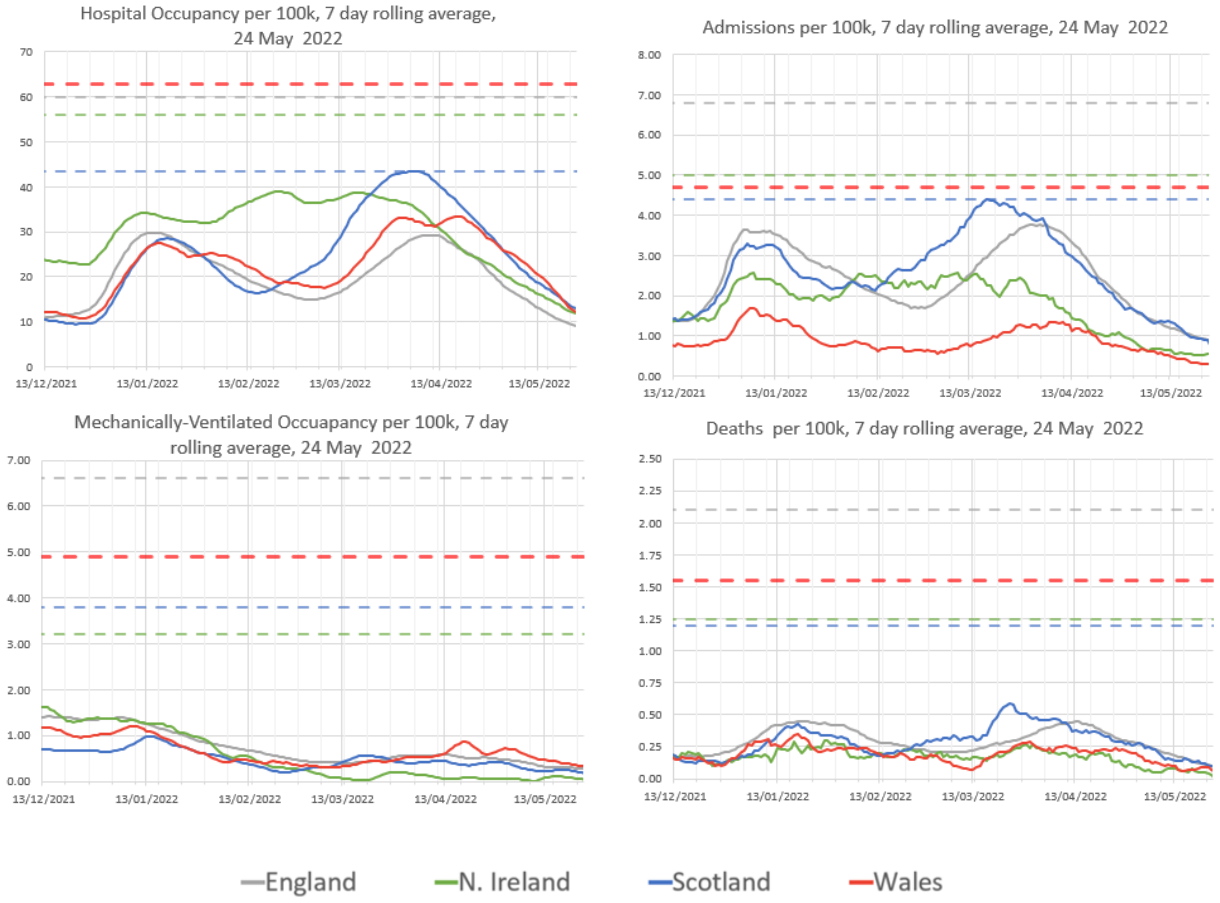


UK Hospitalisation and deaths- UK Coronavirus Dashboard data up to 24 May 2022

- **Note that this data is classified as management information rather than official statistics and there may be differences in methodology between the nations**. As a result caution should be taken when interpreting this data, especially comparing between nations. Full documentation is available at Metrics documentation | Coronavirus in the UK (data.gov.uk). The dotted lines indicate peak levels.
- **Northern Ireland's DoH has recently announced that from 20 May NI data on cases, deaths and testing will no longer be updated.**
- COVID-19 admissions and hospital occupancy continue to decreasing across all four UK nations, although unlike other nations Wales COVID-19 admissions include suspected cases and do not include patients who tested positive while in hospital, **so**

comparisons of admissions with the other UK nations should be interpreted with caution.

- COVID-19 ICU/ Mechanically ventilated bed occupancy is decreasing slightly in Wales and generally stable at a low level relative to previous waves in the other UK nations, but remains far lower than previous waves.
- Following an increase in February/March the number of COVID-19 deaths is decreasing in England and Scotland and stable/ increasing slightly in Northern Ireland and Wales, although numbers remain lower than previous waves.

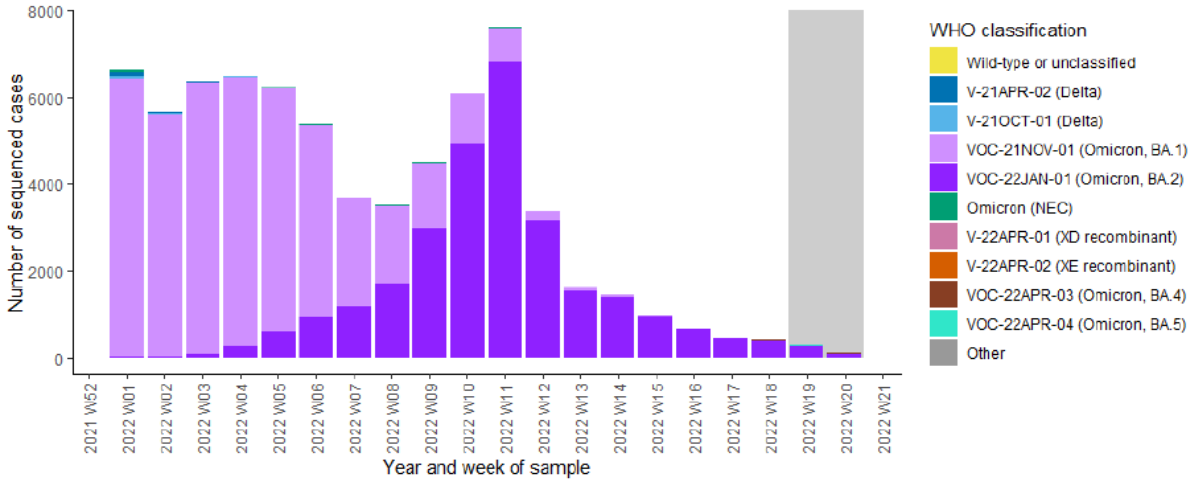


Public Health Wales variant surveillance, 31 May (Source link)

- In the latest reporting week (2022 W21) there were no variants sequenced, however, this should be interpreted with caution as this is indicative of a lag in the sequencing data. In the previous week (2022 W20), 88% of sequenced cases were VOC-22JAN-01 (Omicron, BA.2).
- The current dominant variant in Wales is VOC-22JAN-01 (Omicron, BA.2) which accounted for 86.3% of sequenced cases in the last 14 days.
- As of 31/05/2022 there have been:
    - 57,113 cases of VOC-21NOV-01 (Omicron, BA.1)
    - 28,523 cases of VOC-22JAN-01 (Omicron, BA.2)
    - 0 cases of V-22APR-01 (Omicron, XD)

- 47 cases of V-22APR-02 (Omicron, XE)
- 12 cases of VOC-22APR-03 (Omicron, BA.4)
- 11 cases of VOC-22APR-04 (Omicron, BA.5)In the reporting week 2022 W18 there were 7 Critical Care Admission (CCA) cases, 71% of these had a sequencing result for Omicron. Please note, not all CCA cases are sequenced.

Figure: Epicurve of all sequenced variant cases in Wales, data as at 24/05/2022, Public Health Wales Variant Surveillance Update



Please note data in the grey shaded region is indicative of a lag in sequencing data and should be interpreted with caution.

International – WHO weekly update 25 May

- The WHO Weekly Epidemiological Update dated 25 May reports that globally, the number of new weekly cases has continued the declining trend observed since a peak in January 2022. During the week of 16 through 22 May 2022, over 3.7 million cases were reported, a 3% decrease as compared to the previous week. The number of new weekly deaths also continues to decline, with over 9000 fatalities reported, representing an 11% decrease as compared to the previous week. As of 22 May 2022, over 522 million confirmed cases and over six million deaths have been reported globally.
- The total number of SARS-CoV-2 sequences submitted to GISAID continues to show a declining trend. Among Omicron lineages, BA.2 and its descendent lineages (pooled lineages named BA.2.X) are the dominant variants. As of the epidemiological week 18 in 2022 (1-7 May), the relative proportions of BA.2.X, BA.4, and BA.5 were 94%, 0.8%, and 1%, respectively. Among BA.2 descendent lineages, BA.2.12.1 accounted for 17%. Delta and other VOCs (Alpha, Beta and Gamma) have declined significantly over time but may still be circulating below detection levels.
- Studies are ongoing to further elucidate the characteristics of Omicron lineages that appear to show a growth advantage as compared to BA.1 and BA.2. With currently available data, BA.4, BA.5 and BA.2.12.1 appear to be spreading faster in countries with substantial prior waves of cases due to BA.1; while countries that experienced

more substantial BA.2 waves appear to have fewer cases due to BA.4, BA.5 and BA.2.12.1 at this stage. The extent of vaccination in each country, also likely influences the impact of these emerging Omicron descendent lineages.

- Globally, the WHO report influenza activity has continued to decrease as at 15 May 2022, following a peak in March 2022. Countries are recommended to prepare for the co-circulation of influenza and SARS-CoV-2 viruses. In the temperate zones of the northern hemisphere, influenza activity decreased or remained stable. In the countries of North America, influenza activity was stable compared to the previous period and influenza positivity was higher than usual for this time of year. In the temperate zones of the southern hemisphere, influenza activity was low overall, except in Argentina and Chile. Influenza detections increased in South Africa and Australia.

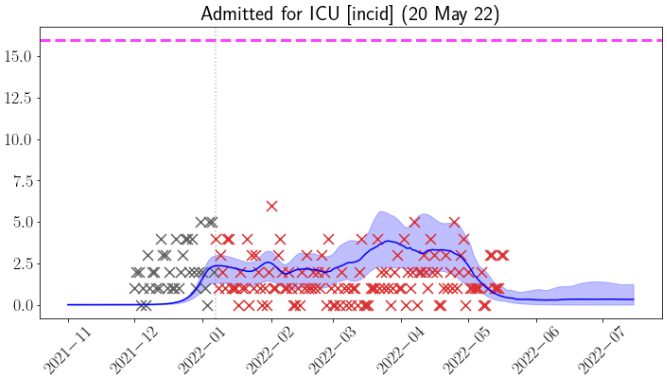
Medium Term Projections, TAC modelling sub-cell

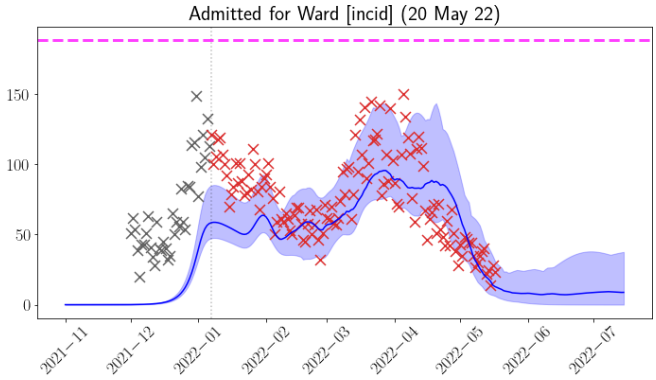
- These medium-term projections (MTPs) are produced regularly by Swansea University. The Swansea University (SU) projections are also combined with other models to go into a consensus MTP for admissions and deaths which is agreed every two weeks by the UKHSA Epidemiological Modelling Review Group (EMRG), which has recently taken over from SPI-M-O in agreeing these MTPs.
- The SU projections are typically more up-to-date and include more outcomes (e.g. ICU), but may be less robust because they are based on one model only. Both MTPs are based on projecting forward from current data and do not explicitly factor in policy changes, changes in testing, changes in behaviour, or rapid changes in vaccinations.

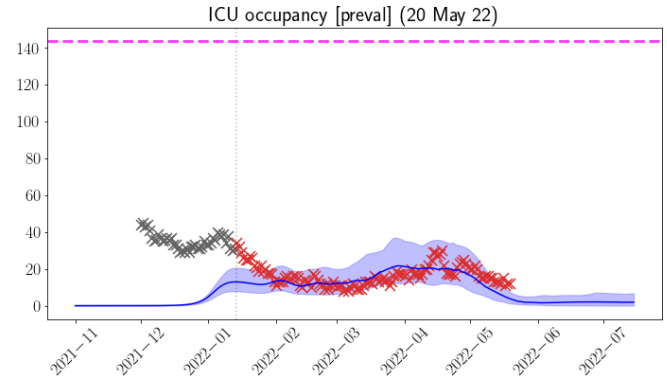
Swansea University MTPs, 20 May

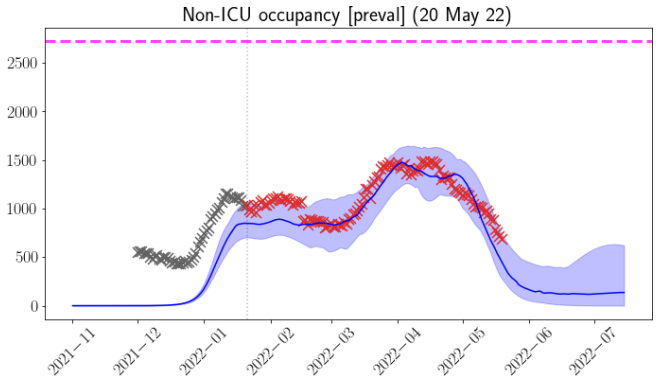
In the below charts crosses represent actual data, while the blue line represents the central modelling estimate and blue highlight indicates confidence intervals. The pink dotted line in the charts below represent pre-Omicron peaks, while the crosses show Actuals data. Red actuals represent Omicron cases, which the model is fitted to, while the black actuals are from the Delta period.

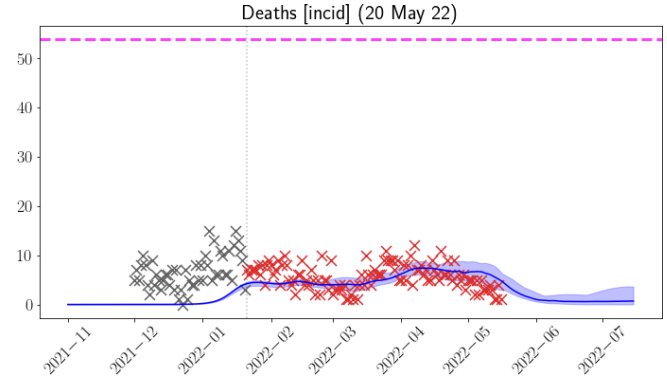
- This week's projections are similar to last week's MTPs. They project that NHS pressure and deaths will stabilise at a low level in the coming months.
- Admissions and deaths have decreased to levels similar to that indicated by the MTP projections.
- ICU admissions remain steady at low levels.
- Bed occupancy and ICU bed occupancy are continuing to decrease, but at a slower rate than that indicated by the MTP projections.
- These projections suggest that we have passed the peak and anticipate a stable low level of NHS pressures in the coming months; especially if current variants continue to dominate.
- Models may be affected by length of stay and changes in hospital testing policy.









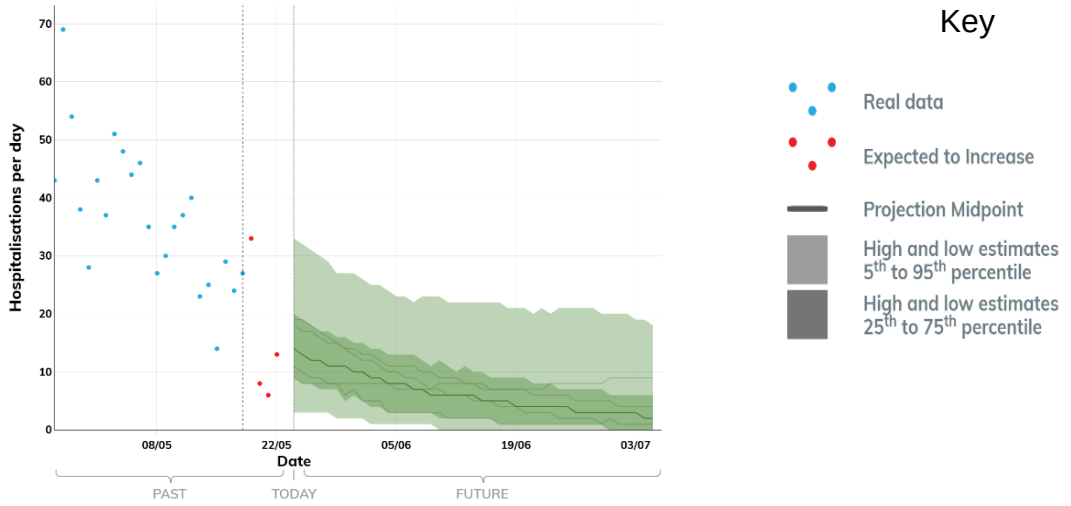


UKHSA EMRG Consensus MTPs, 25 May 2022

- These Medium-Term Projections (MTPs) for COVID-19 hospitalisations and deaths are not forecasts or predictions. They represent a scenario in which the trajectory of the epidemic continues to follow the trends that were seen in data available to 23 May 2022.
- The most recent medium term projections suggest admissions in Wales will continue to decline before stabilising at a low level.
- The number of deaths has fallen to very low levels in Wales making forward projection difficult, therefore projections for deaths are not provided for Wales this week. However, the consensus view is that the number of deaths will remain low over the next six weeks.
- The delay between infection, developing symptoms, the need for hospital care, and death means the MTPs cannot fully reflect the impact of policy and behavioural

changes made in the two to three weeks prior to 23 May 2022. An assumed effect of school holidays has been included.

Modelled projections of new hospital admissions per day in Wales based on data available on 23 May 2022



COVID-19 evidence roundup- summary:

This section aims to summarise a selection of the recent COVID-19 papers, reports and articles that are relevant to a Welsh context or contain new data, insights or emerging evidence relating to COVID-19. It may contain pre-print papers, which should be interpreted with caution as they are often not yet peer-reviewed and may be subject to change when published. The exclusion of any publication in this section should not be viewed as a rejection by the Technical Advisory Cell.

Immunity and vaccine effectiveness

JCVI provides interim advice on an autumn COVID-19 booster programme - GOV.UK (www.gov.uk) (Study link)

- The Joint Committee on Vaccination and Immunisation (JCVI) has provided interim advice to the government regarding COVID-19 booster doses this Autumn for the purposes of operational planning for the health and care sector. JCVI recommends that a COVID-19 vaccine should be offered to those groups most at risk of hospitalisation or death, as well as to health and care staff. These groups are:
    - residents in a care home for older adults and staff;
    - frontline health and social care workers;
    - all those 65 years of age and over;
    - adults aged 16 to 64 years who are in a clinical risk group.
- According to PHW there are around 681,000 people aged 65 and over in Wales, around 180,000 health care and care home workers and at least 45,000 social care

workers. Around 76,000 people aged 16-69 are classed as clinically extremely vulnerable and 350,825 aged 5-64 in a clinical risk group (including those aged 5-15 who would be ineligible under current advice). Source: COVID-19 vaccination - PHW.

- The JCVI will continue its on-going review of the vaccination programme and the scientific data, particularly in relation to the timing and value of doses for less vulnerable older adults and those in clinical risk groups ahead of autumn 2022.The committee will announce its final plans for the autumn programme, including further detail on the definitions of clinical risk groups, in due course.

UKHSA: COVID-19 vaccine effectiveness against the omicron (BA.2) variant in England - The Lancet Infectious Diseases (Study link)

- This study estimates vaccine effectiveness against symptomatic disease and hospitalisation with BA.1 and BA.2 after vaccination, providing evidence of the continuing effectiveness of vaccines against mild and severe disease with BA.2. Although vaccine effectiveness continues to wane over time, no reduction in vaccine effectiveness against symptomatic disease was observed with BA.2 compared with BA.1 and there was no difference in the rate of waning.

- 25 weeks or more after two doses, vaccine effectiveness was 14.8% (95% CI 12.9–16.7) against BA.1 and 27.8% (25.9–29.7) against BA.2. Booster immunisation increased protection after a week to 70.6% (68.9–72.2) against BA.1 and 74.0% (70.8–76.9) against BA.2, waning to 37.4% (35.8–39.0) against BA.1 and 43.7% (42.3–45.1) against BA.2 at 15 or more weeks after receiving the booster dose. Due to the small number of individuals involved, there was greater uncertainty around the vaccine effectiveness estimates against hospitalisation than around those against symptomatic disease.

- The findings continues to suggest vaccine effectiveness against severe disease is higher and retained for longer than effectiveness against mild disease. Since the omicron variant became dominant, people are increasingly likely to have COVID-19 as an incidental finding rather than the primary reason for hospital admission. Using a strict definition of hospitalisation to identify admissions with severe respiratory disease, this analysis finds vaccine effectiveness against hospitalisation was similar for BA.1 and BA.2 after booster vaccination, although vaccine effectiveness against hospitalisation may wane faster for BA.2 than for BA.1. However, this finding may be due to misclassification bias, because of cases incidentally hospitalised with COVID-19 due to the higher infection rates during the periods after the booster when BA.2 predominated.

PREPRINT: Distinct antigenic properties of the SARS-CoV-2 Omicron lineages BA.4 and BA.5 | bioRxiv (Study link)

- This preprint paper outlines an in-depth characterisation of the antigenicity of the BA.4/BA.5 Spike protein, responsible for beginning the immune response process, by comparing blood sera collected post-vaccination, post-BA.1 or BA.2 infection, or post breakthrough infection of vaccinated individuals with the Omicron variant. In addition, the authors assess sensitivity to neutralisation by commonly used therapeutic monoclonal antibodies.

- Results find that sera collected post-vaccination have a similar ability to neutralise BA.1, BA.2 and BA.4/BA.5. In contrast, in the absence of vaccination, prior infection with BA.2 or, in particular, BA.1 results in an antibody response that neutralises BA.4/BA.5 poorly. Breakthrough infection with Omicron in vaccinees leads to a broad neutralising response against the new variants. The sensitivity of BA.4/BA.5 to neutralisation by therapeutic monoclonal antibodies was similar to that of BA.2, being recognised less well by sotrovimab than BA.1 or WT Spike, with marginally better recognition by imbedvimab than BA.1.
- These data suggest BA.4/BA.5 are antigenically distinct from BA.1 and, to a lesser extent, BA.2. The enhanced breadth of neutralisation observed following breakthrough infection with Omicron suggest that boosting vaccination with Omicron-derived antigens could be an effective approach to inducing cross-protective immunity.

COVID-19 Hospitalization Metrics that Do Not Account for Disease Severity Underestimate Protection Provided by SARS-CoV-2 Vaccination and Boosting: A Retrospective Cohort Study | Infection Control & Hospital Epidemiology | Cambridge Core (Study link)

- Following on from a previous study that found vaccinated admissions to hospital with COVID-19 were less likely to have severe disease than unvaccinated patients, this report expands the analysis to include patients during periods of Delta and Omicron predominance who received a third (booster) vaccine. The findings suggest that boosted patients were even less likely to have severe disease than vaccinated patients. These two analyses also strongly suggest that studies that do not take into account disease severity are likely to underestimate vaccine effectiveness against severe disease over time.
- This study has several limitations. Data about prior infection, which could reduce risk of severe disease in any group, were not included due to the likelihood of missing data and complexity of analysis. Data on booster doses are also more likely to be missing than data on initial vaccination. However, both of these factors should underestimate the benefit of boosters. Additionally, the VA population included in the study is mostly male and with high proportions of patients who are older and have chronic medical problems, affecting generalizability. Variant severity is also an important confounding factor that may impact results, although this was included as a variable in the models used.

The magnitude and timing of recalled immunity after breakthrough infection is shaped by SARS-CoV-2 variants: Immunity (cell.com) (Study link)

- A study on the recall of immune responses following vaccination or Delta/Omicron breakthrough infection has been published in Cell Immunity. It considers what happens to antibody responses when vaccinated individuals catch COVID-19, the pace of antibody response, severity of infection and differences between catching Delta vs Omicron BA.1.
- Findings suggest recall of spike-specific memory B cells was more prominent for Delta vs Omicron BA.1 breakthrough infection. While similar viral load kinetics for Delta and Omicron were observed, antibody recall during Delta breakthrough infection coincided with viral clearance.

- Overall, the recall of cross-reactive antibody responses against the vaccine strain is faster for vaccination of previously recovered subjects, followed by Delta breakthrough and Omicron BA.1 breakthrough. Omicron breakthrough infection resulted in lower boosting of cross-reactive antibody responses against the vaccine strain, possibly due to the extensive antigenic changes from wild-type. As a result breakthrough infections will likely play a role in augmenting population level immunity against SARS-CoV-2, potentially reducing healthcare burdens while SARS-CoV-2 heads towards endemicity.
- A caveat of this data is that 50% of Omicron subjects (vs 0% Delta) were recently boosted and had higher levels of baseline Ab responses against the vaccine strain, potentially reducing the observed fold increase in Ab levels following breakthrough.

Variants

Epidemiological analysis of the first 1,000 cases of SARS-CoV-2 lineage BA.1 (B.1.1.529, Omicron) compared to co-circulating Delta, in Wales, United Kingdom (authorea.com) (Study link)

- This study describes the first 1000 cases of the Omicron variant in Wales by demographic, vaccination status, travel and severe outcome status and compare this to contemporaneous cases of the Delta variant. Testing, typing and contact tracing data were collected by Public Health Wales (PHW) and analysis undertaken by the PHW Communicable Disease Surveillance Centre (CDSC). Prevalence ratios for demographic factors and symptoms were calculated comparing Omicron cases to Delta cases identified over the same time period.
- Between 3 and 14 December 2021, 1000 cases of the Omicron variant were identified in Wales. During this time just 3% of cases had a prior history of travel, revealing rapid community transmission. Most cases (82%) were double vaccinated (65.9%) or boosted (16.1%) and overall, 0.5% were hospitalised. Further analysis suggests a lower prevalence of anosmia and a reduced risk of hospitalisation in the first 1000 Omicron cases compared to co-circulating Delta cases. The authors also identify that existing measures for travel restrictions to control importations of new variants identified outside the UK did not prevent the rapid ingress of Omicron within Wales. As a result, the authors recommend that both the methods for identifying countries at risk and the mechanisms by which importation is controlled are reviewed.

Correspondence: Where is the next SARS-CoV-2 variant of concern? - The Lancet (Study link)

- In this correspondence, several scientists stress the importance of curing long-term SARS-CoV-2 infections, such as those observed in immunocompromised patients, as preliminary evidence suggests it is likely these are the source of at least some of the pandemic's ‘variants of concern'. It is therefore possible that an existing or future patient may harbour the next variant of concern, that could be highly transmissible, more severe and/or challenge existing immunity and therapeutics.
- Immunocompromised patients, such as those infected with HIV or recipients of organ transplants, can have difficulty eliminating SARS-CoV-2 infections. Because the virus population size within persistent infections is not limited by bottlenecks at transmission,

the rate of mutation is accelerated in comparison with the population at large, so these infections typically generate considerable genetic novelty. Although the evolutionary pressures on a virus within an individual host might be different from the adaptation to transmit between hosts, it is reasonable to assume that the next variant of concern could arise from a virus population with a high degree of genetic diversity and contain mutations allowing infection of resistant individuals. The possibility of SARS-CoV-2 evolving resistance to existing therapies during such infections is also real.

- As a result, the authors argue it is of the utmost urgency that those with long-term SARS-CoV-2infections should be able to access quality health care and be prioritised for curative therapy, because a failure to properly manage these infections poses a risk to the individual and to public health.

Clinical

How coronavirus (COVID-19) compares with flu and pneumonia as a cause of death - Office for National Statistics (ons.gov.uk) (Study link)

- The Office for National Statistics (ONS) has published an article exploring how COVID-19 has compared to flu and pneumonia as a cause of death in England and Wales between 13 March 2020 and 1 April 2022. Overall, the number of deaths with coronavirus (COVID-19) as the underlying cause is more than four times higher than the number caused by flu and pneumonia since March 2020 and higher than any previous flu year since 1929, although it has fallen recently from previous peaks.

- Although mortality from COVID-19 has reduced since the start of the coronavirus pandemic, this article is not able to give a definitive answer whether the disease is now behaving similarly to flu and pneumonia. Fewer than two-thirds (62%) of deaths involving COVID-19 in the week ending 1 April 2022 were caused by the disease, with similar proportions throughout March. This is down from 90% in spring 2020 and the early part of 2021, possibly driven by booster vaccinations and high antibody levels across the population. By comparison in the week ending 1 April 2022, a fifth of deaths involving flu and pneumonia (20%) were due to these conditions, similar to most weeks since March 2021. Deaths due to COVID-19 are also less concentrated in the oldest age groups compared with deaths due to flu and pneumonia.

- Between March 2020 and March 2022, almost three-quarters (73.7%) of deaths due to flu and pneumonia in England and Wales occurred among those aged 80 years and over, compared with 58.3% of deaths due to COVID-19. Around one in three (33.8%) deaths due to COVID-19 occurred among people aged 60 to 79 years, compared with just over one in five (21.3%) deaths due to flu and pneumonia. Meanwhile, roughly 1 in 12 (7.9%) deaths due to COVID-19 were among those aged below 60 years, compared with 1 in 20 (5.0%) deaths due to flu and pneumonia.

- The number of deaths due to flu and pneumonia fell below 20,000 in 2020 for the first time since 1948, before reaching a record low of 16,237 in 2021. This decrease during the coronavirus pandemic could be linked to restrictions that limited social contact.

- Directly comparing COVID-19 deaths with those from flu and pneumonia has limitations. For example, death certificates likely underestimate flu deaths because not all patients are tested for it, and circulating flu causes increases in deaths due to other

conditions such as cardiovascular diseases. However, these figures do allow comparison of the trends and approximate mortality associated with each.

Coronavirus (COVID-19) Infection Survey, characteristics of people testing positive for COVID-19, UK - Office for National Statistics (Study link)

- The ONS has published an updated report assessing characteristics of people testing positive for COVID-19. Findings suggest that those who reported being vaccinated recently or who were previously infected with COVID-19 also continued to be less likely to test positive than those who had not experienced a prior infection, in the fortnight ending 7 May 2022. People who reported that they had travelled abroad in the last 28 days also continued to be more likely to test positive for COVID-19 than those who had not.
- The risk of COVID-19 re-infection was approximately eight times higher in the period when the Omicron variants were most common (20 December 2021 to 13 May 2022), compared with when the Delta variant was most common (17 May to 19 December 2021). People who were unvaccinated continued to be more likely to be re-infected with COVID-19 than people who had been vaccinated, from 2 July 2020 to 13 May 2022. People who reported symptoms with their original infection continued to be less likely to be re-infected than those who did not, and people continued to be more likely to be re-infected if they had a lower viral load (higher Ct value) in their first infection; both of these findings may be because of a weaker immune response in “milder” primary infections. Older people continued to be less likely to be re-infected.
- People who had contact with hospitals continued to be less likely to test positive compared with those living in households where no one had contact with hospitals. Adults living with a child aged 16 years or under continued to be less likely to test positive than those who did not live with a child. People living in a household with two or three people were more likely to test positive than those living alone
- Of interest is that people who reported regularly using lateral flow tests continued to be more likely to test positive compared with those who did not; it is suggested this is likely related to those at a higher risk of infection such as particular occupations being encouraged to take regular lateral flow tests.

  An additional model examines the effect of behavioural characteristics on the likelihood of testing positive, while controlling for core demographic variables and the above characteristics. Overall, these findings suggest that in the fortnight ending 7 May 2022 people who reported spending more time socialising outside their home continued to be more likely to test positive.

Social Care

The association between the discharge of patients from hospitals and COVID in care homes - GOV.UK (www.gov.uk) (Study link)

- A consensus statement on the impact of hospital discharge of COVID-19 patients to care homes from SAGE’s Social Care Working Group, written in December 2021, has recently been published. It includes studies from the UK devolved administration’s public health authorities, including a previously published report from PHW (link).

- The findings suggest that hospital discharge to care homes connects two high contact environments and at least some care home outbreaks were caused or partly caused or intensified by discharges from hospital. However, based on the very much larger associations between care home size (a proxy for all footfall) and outbreaks, hospital discharge is highly unlikely to have been the dominant driver of all care home outbreaks in wave 1.
- Further, in any future epidemic with high consequence in older and vulnerable people, the report recommends greater consideration should be given to minimising potential exposure in care homes. This includes consideration of how to safely transfer existing or new residents to care homes from hospitals or from the community, but also active consideration of ways to minimise all possible routes of infection entry to the care home, and to minimise spread within the care home if infection is introduced (including support for infection prevention and control and rapid access to personal protective equipment (PPE) and other control measures).
- It is noted a key limitation of many of the analyses presented is a lack of good quality routine data in social care, by comparison with the NHS. This reflects longstanding weaknesses in social care data collection. The report therefore argues there is an urgent need to collect Social care Episode Statistics (similar to hospitals) to support understanding and improving care in normal times. This is vital to ensure that data sources are in place to monitor and mitigate the introduction and transmission of infection in future pandemics.

Long COVID

The protective effect of covid-19 vaccination on post-acute sequelae of covid-19 | Oxford Academic (oup.com) (Study link)

- A new study published in *Open Forum Infectious Diseases* considers the impact of vaccines on reduced severity of infection and post-acute sequelae of covid-19 (PASC), commonly known as long covid. The study used multicentre data from between September 2020 and December 2021 and excluded post-follow-up results after December 14, 2021 to avoid the Omicron variant, which has a high rate of breakthrough infection.
- As well as an around 80% reduction in mortality risk over 28 and 90 day periods, there was also a marked reduction in ongoing and new conditions such as hypertension, diabetes and heart disease reported, with the relative risk widening over the longer period. At 90 days following COVID diagnosis, for the vaccine cohort the relative risk of hypertension was 0.33 (95% CI: 0.26, 0.42), diabetes was 0.28 (95% CI: 0.20, 0.38), heart disease was 0.35 (95% CI: 0.29, 0.44), and death was 0.21 (95% CI: 0.16, 0.27). Differences in both 28 and 90-day risk between the vaccine and no-vaccine cohorts were observed for each outcome and there was enough evidence ($p < .05$) to suggest that these differences were attributed to the vaccine.
- The authors conclude that prior vaccination against COVID-19 is associated with significantly lower risk of post-acute COVID-19 symptoms or new onset of 10 health conditions which are commonly included in symptoms of Long COVID.

PREPRINT: Understanding Post-Acute Sequelae of SARS-CoV-2 Infection through Data-Driven Analysis with Longitudinal Electronic Health Records: Findings from the RECOVER Initiative | medRxiv (Study link)

- This study aims to characterize PASC, commonly known as long covid, using the large patient populations contained in the electronic health from two large national patient-centred clinical research networks in the US. The authors identify a broad list of diagnoses and medications with significantly higher incidence 30-180 days after the laboratory-confirmed SARS-CoV-2 infection compared to non-infected patients. They also found more PASC diagnoses and a higher risk of PASC in NYC than in Florida, which highlights the heterogeneity of PASC in different populations.
- The apparent incidence of some of the most commonly reported sequalae (fatigue, joint pain, headache) appear to have low absolute incidence due to covid at 2%, 1.2% and 0.55% respectively. All sequalae have overall low incidence, with the highest single sequalae (shortness of breath) reported at 5.5%. Almost every sequalae reported is much more common in those with pre-existing conditions. However some sequalae are clearly highly elevated, particularly severe pulmonary embolism, diabetes, and abnormal heartbeat, although overall incidence is still low at 0.5%,0.6% and 1.2% respectively.
- Limitations of the study are that it is based on healthcare records, so is limited to those who accessed a healthcare setting. The study also covers a relatively short period of around a month prior to the dominance of the Omicron variant and vaccine status for patients was not available.

Long COVID after breakthrough SARS-CoV-2 infection | Nature Medicine (Study link)

- This study used the US Department of Veterans Affairs national healthcare databases to build a cohort of 33,940 individuals with breakthrough SARS-CoV-2 infection (BTI) and several controls of people without a recorded history of SARS-CoV-2 infection. At 6 months after infection beyond the first 30 days of illness, compared to contemporary controls, people with BTI exhibited a higher risk of death (hazard ratio (HR) = 1.75, 95% confidence interval (CI): 1.59, 1.93) and incident post-acute sequelae (HR = 1.50, 95% CI: 1.46, 1.54), including cardiovascular, coagulation and hematologic, gastrointestinal, kidney, mental health, metabolic, musculoskeletal and neurologic disorders.
- The results were consistent in comparisons versus the historical and vaccinated controls. Compared to people with SARS-CoV-2 infection who were not previously vaccinated, people with BTI exhibited lower risks of death (HR = 0.66, 95% CI: 0.58, 0.74) and incident post-acute sequelae (HR = 0.85, 95% CI: 0.82, 0.89).
- Overall, the findings suggest that vaccination before infection confers only partial protection in the post-acute phase of the disease; hence, reliance on it as a sole mitigation strategy may not optimally reduce long-term health consequences of SARS-CoV-2 infection. The findings emphasize the need for continued optimization of strategies for primary prevention of BTI and will guide development of post-acute care pathways for people with BTI.
- Compared to people who were hospitalized with seasonal influenza, people with BTI who were hospitalized during the acute phase of the disease and survived the first 30 days exhibited an increased risk of death (HR = 2.43 (2.02, 2.93); burden of 43.58

(31.21, 58.26)) and increased risk of having at least one post-acute sequela (HR = 1.27 (1.19, 1.36); burden of 87.59 (63.83, 111.40)). People with BTI exhibited increased risk of sequelae in all the examined organ systems compared to those with seasonal influenza.

- As noted in another study in this briefing, the VA population included in the study is mostly male and with high proportions of patients who are older and have chronic medical problems, affecting generalizability.

Environmental Science

Wales COVID-19 Evidence Centre: What impact have COVID-19 induced changes in working practice had on greenhouse gas emissions? A rapid review | Research Square (Study link)

- The changes in working practice over the pandemic went through several distinct phases: the initial 'lockdown' period, a period of relaxation in some restrictions, and a longer-term period where working from home (WFH) was preferred if possible but many other aspects of life returned to near-normal. This Rapid Review was accompanied by high level life cycle assessment (LCA), to describe trends in environmental effects, specifically regarding greenhouse gas emissions relating to energy usage and commuting behaviour, during the pandemic.
- Overall, there was a net reduction in consumption and greenhouse gas emissions with greater working from home. Domestic energy consumption remained elevated after easing restrictions with a displacement of energy normally consumed in business premises. There has been a shift away from public transport with a negative effect on greenhouse gas emissions. Travel distance and mode of transport are significant factors in determining the magnitude of benefits seen when working from home. Air quality is reported to have been affected by the lockdown period, but no studies have directly evaluated the working from home component of this.
- For the Life cycle assessment, analysis was based on 10 workers at home or in an office in typical UK housing and a typical office with two transport options for commuting (car and train), over 7 days. A clear benefit was seen in reducing greenhouse gas emissions for working from home compared to office work with travel by car, and a smaller benefit for working from home compared to office work by train. The working from home scenario had significantly lower impact than both the car and train commute scenarios on marine ecotoxicity and freshwater ecotoxicity indicators.

Therapeutics

Paxlovid not effective for post-exposure prophylactic use (Study link)

- The oral anti-viral treatments Paxlovid has been shown[1] to have a significant effect on reducing hospitalisation in mild and moderate COVID-19 and unlike other antibody treatments can be taken at home, potentially reducing the burden on hospitals. At the

[1] COVID-19: Pfizer's paxlovid is 89% effective in patients at risk of serious illness, company reports | The BMJ

same time, this also opened the possibility of using these treatments as a preventative treatment for those in close contact with infected people.

- However, Pfizer have recently shared their results from their Phase 2/3 EPIC-PEP trial, which found that compared to a placebo, observed risk reductions of vaccination in the risk of infection were not statistically significant. Available safety data for PAXLOVID has remained generally consistent in more than 3,500 PAXLOVID-treated participants across the studies, as well as in reported post-market safety experience. Analyses of all secondary endpoints and sub-groups are ongoing, and results will be included in the publication or presentation of the final study results.
- Recent anecdotal and media reporting[2] suggests that some individuals have reported only a temporary effect of the drug; experiencing a second round of symptoms, and going back to testing positive, when the pills were done. This phenomenon has become known as "Paxlovid rebound" in reporting. However, to date no comprehensive study has taken place and Pfizer's official clinical trials found rebound in only 1% to 2% of patients, occurring in both placebo and treatment groups, although it continues to monitor the data.

Lessons learned

What Counts? A scoping inquiry into how well the government's evidence for COVID-19 decisions served society – Sense about Science (Study link)

- A report from the 'What Counts?' scoping inquiry, set up to explore what society needed to know during the pandemic and how well the UK government was able to respond, suggests several significant questions that arise from the pandemic about the basis for government's decisions and whether people across society could understand and apply it.
- The inquiry focused on the interface with policy evidence of the UK government. There were no appreciable differences from people surveyed in the devolved administrations. There were small differences in how the governments presented policy aims and evidence, and a larger inquiry could look at whether the effects of these are worth exploring.
- As well as a number of key findings, the report's concludes with the following recommendations:
    - Investigation of whether an authoritarian approach with simple messaging has a limited place, such as in emergencies of shorter duration or simpler implications.
    - The government should consider setting up a socially responsive trials unit, which could be scaled up to major policy actions in the future, building on the What Works initiatives.
    - Politicians and policy advisors should consider whether, in emphasising simple messaging, it is leaving others to provide the analysis on which people act; it should seek to understand the role played by intermediaries of government

[2] Rebound COVID Is Just the Start of Paxlovid's Mysteries - The Atlantic
Reports of 'Paxlovid rebound' have COVID experts looking for theories (statnews.com)
Paxlovid Rebound: What Scientists Know So Far | Time

data, such as the actuaries on Twitter, and to learn from individuals within government who took on the role of guiding people through evidence in social media discussions.

- Government should review whether modelling has been under-deployed with respect to exploring how to meet competing goals, and how future pan-departmental policy issues and crisis responses might use modelling to optimise interventions to do the most good for the least harm.
- The Cabinet Office and the Treasury should implement a plan to ensure full publication of models used in policy making, including their assumptions, code and scenarios.
- Government should reflect on the large burden of communication put on its emergency committee. Because inputs to the scientific advice were transparent, whereas economic advice and policy advice were not, there was too much focus on scientific advice to provide the rationale for policy.
- Government should also consider the associated risk of its emergency advice body being concerned with what the public and media think.
- In addition, attention is needed to the question of whether commandeering the strongest independent modelling centres for long periods creates risks, and whether crisis management requires some modellers independent of the constraints given by policy makers.
- Government should investigate whether rapid sharing of useful evidence with stakeholder groups may have been hampered by reducing the leadership of policies by dedicated departments.
- Government should consider how it might set a transparency of evidence standard.
- Government should use the experience of the mass engagement of the crisis to restructure gov.uk in a way that is responsive and accessible to people looking for policy evidence and rationale.
- Both government and the public need to be better equipped to discuss difficult trade-offs and uncertainty.
- If government sees its role as enabling society, both in the implementation of policy and in making well-reasoned judgements in the many and varied settings, then it should explore what this approach means in practice.

Non-COVID: Monkey Pox

Monkeypox: What do we know about the outbreaks in Europe and North America? | The BMJ (Study Link)

- Monkeypox, a virus first discovered in monkeys in 1958 and that spread to humans in 1970, is now being seen in small but rising numbers in Western Europe and North America. Case numbers seem to be rising daily though are still low.
- Although there are no specific treatments for monkeypox, the smallpox vaccine—which has been shown to be up to 85% effective in preventing monkeypox—and the

antivirals cidofovir and tecovirimat can be used to control outbreaks. The UK government has reportedly bought thousands of vaccine doses and already begun deploying them among close contacts of infected people.

- Symptoms can include fever, headache, muscle aches, backache, swollen lymph nodes, chills, and exhaustion. Typically a rash will develop, which often starts on the face but can then spread to other areas such as the genitals. The rash will go through different stages before forming a scab that finally falls off. Generally, monkeypox cases are mild and people tend to recover within weeks. But the death rate varies, depending on the type. The ECDC has said that the west African clade, the type so far seen in Europe, has a case fatality rate of around 3.6% (estimated from studies conducted in African countries). Mortality is higher in children, young adults, and immunocompromised individuals.
- Transmission between people mostly occurs through large respiratory droplets, normally meaning prolonged contact face to face. But the virus can also spread through bodily fluids. The latest cases have mainly been among men who have sex with men and UKHSA has said that, although monkeypox has not previously been described as a sexually transmitted infection, it can be passed on by direct contact during sex or other close contact, including clothing or linens used by a person who has monkeypox. The likelihood of transmission between individuals without close contact is considered to be low. As a result members of these communities and clinicians are recommended to be alert to symptoms, recognising it is critical to avoid stigmatising infected people so that they are supported to come forward confidentially for testing and contact tracing.
- As of 25 May, the latest cases bring the total number confirmed since 7 May to 85 in England, 3 confirmed cases in Scotland, 1 in Wales and 1 in Northern Ireland[3]. Meanwhile as of 20 May, Spain has reported 23 potential but unconfirmed cases and Portugal has confirmed five of its 20 suspected cases and 1 case in the US has been confirmed.
- The UKHSA and ECDC risk assessments are available at Monkeypox: background information - GOV.UK (www.gov.uk) and Risk assessment: Monkeypox multi-country outbreak (europa.eu).

Principles for monkeypox control in the UK: 4 nations consensus statement - GOV.UK (www.gov.uk) (Link)

- A statement outlining the principles of monkeypox infection prevention and control has been agreed by the UK public health agencies. It outlines the following strategic aims:
    - to suppress the transmission of monkeypox in the community and aim for eradication (decreasing Rt below 1) by targeting public health measures to the highest risks for transmission
    - to protect against spread of infection in hospitals and healthcare settings and to healthcare workers assessing and managing patients

[3] Monkeypox cases confirmed in England – latest updates - GOV.UK (www.gov.uk)

  - to enable safe functioning of NHS services, including those services which can diagnose and manage cases, in the context of community transmission of monkeypox

- The consensus statement also considers implications for a community/domestic settings, secondary care and ambulatory care.