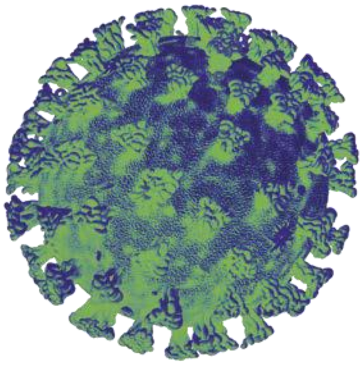
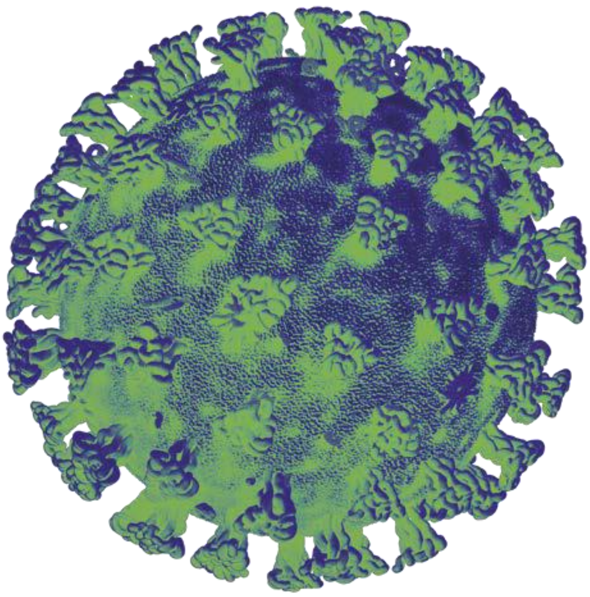
Llywodraeth Cymru
Welsh Government

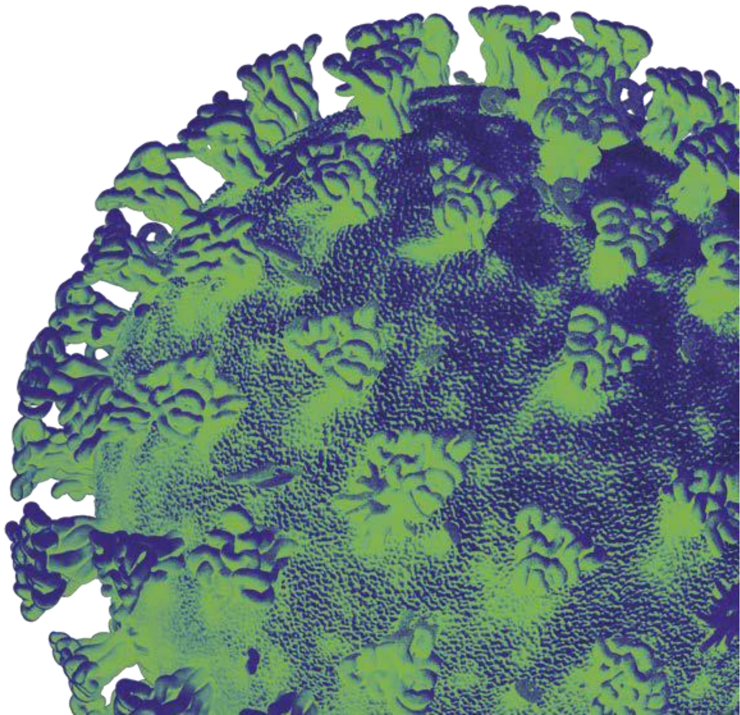
Technical Advisory Cell

Summary of Advice

10 February 2022







Technical Advisory Cell: Summary of Advice

10 February 2022

Contents

Top Line Summary

- As at 4 February case numbers in Wales appear to be decreasing. This is supported by the most recent estimates from the ONS COVID Infection Survey, although the Zoe COVID symptom study estimates increasing cases and wastewater monitoring appears generally stable. Test positivity as reported by PHW has also decreased to 32.1%.

- As at 8 February the total number of COVID patients occupying a hospital bed (confirmed, suspected and recovering) have increased slightly, with the total at 1101. The number of confirmed COVID patients in hospital has decreased to 545. COVID related patients occupying a critical care bed have continued to reduce to 18, 8 lower than last week and the lowest number since the 17th July 2021. The total occupied core and surge beds in a critical care environment was 168, this is 16 higher than the pre-COVID baseline of 152 for critical care beds and 3 higher than the same day last week.

- As at 4 February the number of weekly COVID-19 deaths reported by PHW has remained stable in the most recent weeks at 47 deaths, while lagged ONS reporting up to 28 January shows reduction in COVID deaths to 60 and the total number of deaths was 12.4% below the five-year average (103 fewer deaths). Compared with the 2015 to 2019 (pre-pandemic) five-year average, deaths in Wales were 9.1% below average (73 fewer deaths).

- UKHSA estimate the Reproduction number (R) for Wales to be between 0.8 and 1.0 with a growth rate of halving every 20 days to flat, while PHW's estimate of R for Wales, which is less lagged, is 0.85 with a halving time of 31 days.

- As at 8 February 2022, an additional **23,642** doses of COVID-19 vaccine have been given in Wales and recorded in the COVID-19 Welsh Immunisation System compared to the previous week. **3,389** were first doses, **4,600** were second doses, **15,307**) were booster doses and **346**) were third dose primary courses for immunosuppressed individuals.

- Gaps in vaccination coverage continue to reduce but at a slower rate than recent months, with the lowest coverage in the 'unknown,' African, Black Caribbean and Mixed ethnic groups. Vaccination coverage at the time of delivery in pregnant women delivering in the latest month has improved considerably but remains lower than in the general population. However, coverage continues to increase after delivery. No other variants of concern were confirmed by genomic sequencing in Wales.

- As at 2 February 2021, Wales has had 59,461 confirmed cases of the **Omicron** BA.1 variant (+**10,441** from the previous week), 94 cases of Omicron BA.2 **(+0)**, 91,049 cases of **Delta** (+**41**) 14,996 cases of **AY.4.2** (**+29**) and 12,444 cases of **Alpha (+1)**.

- PHW's public engagement survey data reports that 47% of people said they had been following the restrictions 'completely' and a further 38% reported mostly complying. 49% of people said they had taken a lateral flow test in the past 7 days. 67% of people thought the restrictions in place to manage coronavirus were 'about right'. However, 34% thought they were 'too much', an increase from 12% in December 2021. The remaining 8% thought the restrictions were 'too little'. 85% of people said they supported the continued requirement for face coverings in shops and other indoor public places in Wales. However 13% said they did not, an increase from 5% in December 2021.

- Google mobility data as at 9 February suggests in the most recent week public transport mobility increased marginally to -32.4% below the baseline. Residential (i.e. people spending time at home) remains stable at 5.8% below the baseline. Retail & recreation mobility increased marginally to -9.2% below the baseline. Supermarkets & pharmacy remain stable at 4.4% below the baseline. Workplaces increased marginally to -19.2% below the baseline.

SAGE 104, 11 February 2022

- A paper from SPI-M considering the extent to which measures and pandemic behaviours **[in England]** are currently reducing transmission estimates that together these may be reducing transmission by approximately 20-45%. This is equivalent to a potential transmission increase of between 25-80% if the population were to rapidly return to pre-pandemic behaviours and no mitigations. The BA.2 variant may have a growth advantage over other omicron sub-lineages. If this were the case, it is possible that SPI-M-O's medium-term projections may underestimate the short-term trajectory of hospitalisations.

- A paper from SPI-B on the social and behavioural impacts of lifting restrictions, including testing and self-isolation, recommends that in the event of remaining restrictions being lifted, policy makers and communicators should seek to mitigate potential economic and social harms to those identifying as clinically vulnerable and those from deprived socio-economic and minority groups. Removal of free access to testing will make it more difficult for people experiencing Covid-19 symptoms to confirm infectiousness and take actions (including self-isolation) to reduce transmission to others, potentially increasing anxiety and reducing social participation (medium confidence).

    - If the legal requirement to self-isolate upon testing positive is lifted, it is likely to lead to further ambiguity among the public about the need for strict adherence. This will disproportionately impact vulnerable sections of the population.

    - Lifting remaining restrictions provides an opportunity to forge a new narrative about maintaining safe behaviours. The legitimacy of narratives may well be increased if the loss and trauma of the pandemic is acknowledged alongside messages about a return to normality. As perceptions of personal risk decline, messaging on safe behaviours should stress recognition of the different risks, needs and risk appetites of others to help prevent abusive incidents, social tensions, and stigma towards minority groups.

    - Any communications should use a range of channels to increase reach and accessibility of communications. There is an important role for community champions in communicating public health advice. People have higher confidence in health advice from health professionals and scientists compared to politicians, and a shift in responsibility for messaging from central government to public health and NHS agencies may be timely. However, it is important that cross-Government departments remain consistent in their Covid-related communications, to avoid undermining health-led messaging.

- Adherence can be promoted by ensuring institutions and environments are supportive. Organisations should be encouraged and enabled to decide and enact proportionate measures in consultation with local public health staff.

COVID-19 evidence roundup - top line summary:

Variants and vaccine effectiveness

- UKHSA's updated vaccine surveillance report shows the almost total waning of protection against symptomatic disease with 2 doses at 25 weeks is reversed by booster vaccination, which is 60-75% 2-4 weeks after vaccination but drops to 25-40% from 15 weeks after the booster. Vaccine effectiveness against hospitalisation following a boost remains high at 90% at 4 weeks, falling to around 80% for Pfizer at 10-14 weeks and 90% for Moderna at 5-9 weeks. (link)

- Early data from Israel, which in January began administering a fourth dose to people aged 60+ and at-risk populations, suggests compared to three doses given at least four months previously a fourth dose reduces the rate of confirmed infection by a factor of two and the rate of severe disease by a factor of four, with wide confidence intervals for the latter. (link)

- A study of infectivity and transmission for different Omicron subvariants in Danish households found BA.2 to be associated with a more than doubled risk of infection, regardless of vaccination status. There was also evidence of increased transmission from unvaccinated BA.2 cases compared to BA.1 cases. This suggests that BA.2 is inherently more transmissible than the currently dominant BA.1 strain and possesses immune-evasive properties that reduce the protective effect of vaccination against infection, but not against transmissibility. (link)

- A pre-print study on the results of a human challenge trial outlines detailed characteristics of early infection and their public health implications. All subjects had mild symptoms and positive lateral flow tests correlated well with viable virus. No serious safety signals were detected and as a result more human challenge studies are planned to allow rapid evaluation of vaccines antivirals and diagnostics. (link)

Immunity

- Another study published in *Cell* suggest that that although neutralising immunity is reduced against the Omicron variant, T-cell responses (which target infected cells post infection) are largely preserved, although a small subset of individuals see a 50% reduction in T-cell reactivity to Omicron. (link)

- A study of neutralising antibodies in elderly individuals suggests that although antibody levels wane significantly after 2 doses, these return with booster vaccination and are maintained for longer and at a higher base level. (link)

- The latest insights from ONS on antibodies suggests that adult antibodies at the standard or higher threshold of protection are around 98% across all 4 nations, following previous evidence of antibody waning in those aged 50+ in Summer 2021. This is likely a result of the vaccination booster programme. (link)
- Another analysis from ONS looking at characteristics of individuals testing positive shows there have been an around 69% increase in COVID-19 reinfections since the rise of the Omicron variant, although there has not been a change in risk of symptoms compared to first infections. (link)

Ethnicity

- An English preprint study highlights that dismay, frustration and altruism were reported across all ethnic groups during the first six to nine months of the pandemic. The authors suggest to maintain public trust it is imperative that governmental bodies consider vulnerable groups, producing clear COVID-19 control guidance with contingency, fiscal, service provision and communication policies for the next rise in COVID-19 cases. This includes easy access to hand-washing facilities in homes, work, all food providers and shopping centres; toilet facilities and adequate living accommodation and work environment facilitating IPC for all. (link)
- A study of linked data source in England analysing the combined impact of obesity and ethnicity on COVID-19 outcomes in the first Wave has shown that BMI was more strongly associated with COVID-19 mortality in ethnic minority groups than among those of white ethnicity, with South Asian ethnicities at greatest risk. For all ethnic minority groups, mortality rates are higher and the gap relative to mortality for those of white ethnicity widens with increasing BMI. The study also found similar associations when looking at risk of hospitalisation. (link)
- An ONS analysis shows that since the vaccination programme began, the risk of death from COVID-19 has continued to be higher in most ethnic minority groups than in the White British ethnic group. These differences in mortality are largely explained by socio-demographic and economic factors and health inequalities. Lower vaccination coverage in some ethnic groups also contributes to the elevated risk of COVID-19 death, particularly in the Black African and Black Caribbean groups. (link)
- An analysis of pulse oximeter measurements across ethnic groups extends previous concerns around pulse oximeters giving a falsely high reading in patients with Black ethnicity to those with Asian ethnicity as well. Although these data cannot quantify the impact of these measurement errors of pulse oximetry on clinical care, the authors suggest that any delay in appreciating the severity of COVID-19 pneumonitis is likely to be detrimental to patient care, especially now that new therapeutic options are becoming available (link). A UK-led review of potential bias in medical devices is currently ongoing and the findings will be published in the next 18 months.

Testing

- A pre-print study of use lateral flow devices among US healthcare workers looking to exit self-isolation to return to work shows that a substantial proportion of individuals with COVID-19 are likely still contagious after day 5 of illness, regardless of symptom status. Early liberation from isolation without a supporting negative LFT should be undertaken only with the understanding that inclusion of individuals on day 6-10 of illness in community or work settings may increase the risk of COVID-19 spread to others (link). Current Welsh Government guidance is that an individual should self-isolate for at least 5 days, after which they should exit self-isolation following 2 negative tests on 2 consecutive days.

Transmission and environmental science

- A pre-print study of viral stability and disinfection efficacy for different SARS-CoV-2 variant suggest that on skin surfaces the Omicron variant may last as long as 21 hours, compared to 8 for the original Wuhan strain, emphasising the importance of hand hygiene. In natural condition on human skin, all variants were completely inactivated by 35% (w/w) ethanol for 15 seconds (link).

Modelling

A modelling study exploring the consequences of global vaccine (in)equity in the face of evolving COVID-19 strains suggests that vaccine inequity provides only limited and short-term benefits to high-income countries (HICs). Equitable global vaccine allocation strategies, in contrast, substantially curb the spread of new strains. For HICs, making immediate and generous vaccine donations to low and middle income countries is a practical pathway to protect everyone and curb the spread of new variants globally (link).

Socio-economic harms

- A preprint study from PHW asking working adults about their work priorities and employment changes during the pandemic suggests that those prone to facing insecurity within their working lives were more likely to consider changing their employment conditions – these groups may require additional support in accessing secure and flexible work. The COVID-19 pandemic has exacerbated societal inequalities, however the recovery phase offers the opportunity to reduce these longstanding inequalities that have become more visible during the pandemic itself. (link)

Behavioural insights and mental health

- Another PHW study suggests that overall self-isolation is particularly challenging for younger people, women and those with precarious incomes. Identifying those with precarious incomes and at greatest risk of experiencing mental health harms of self-isolation during initial conversations with contact tracers is a key priority to ensure comprehensive assessment of needs and access to targeted support to help maximize potential adherence to self-isolation during this and future pandemics. (link)

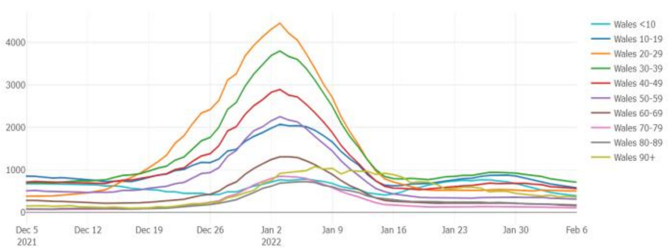
End of summary

<u>Wales Sit-Rep</u>

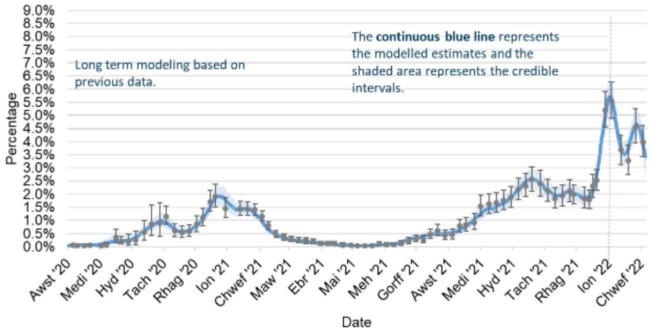
- The latest fortnightly COVID-19 Situational Report dated 4 February, containing periodic data on epidemiological surveillance, NHS status, wastewater monitoring, education and children, international travel, mobility, vaccination and population immunity and forward projections for Wales is available here.
- **PHW case data may be affected by behavioural changes and the recent policy change across the UK on 6 January that those who receive a positive lateral flow test will no longer be required to take a follow-up PCR test.**
- Overall case incidence has **decreased to 428 per 100,000 population** in the 7-day period ending 4 February (compared to 547 for the previous week). Test positivity has also **decreased to 32.1%** during this period (compared to 35.2% for the previous week). A weekly regional summary is published by PHW on their dashboard.
- In the week ending 4 February the highest case incidence by age group remains the 30-39 age group at 711 per 100,000 population, while the lowest is in 70-79 at 109 per 100,000 population. Case rates have decreased in all age groups, with the largest reductions in <10, 10-19 and 30-39.
- Estimates from the COVID-19 Coronavirus Infection Survey on the percentage of people testing positive in Wales decreased in the week ending 5 February 2022. It is estimated that 121,200 people in Wales had COVID-19. This equates to 3.99% of the population who had COVID-19, or around **1 in 25 people**. This compares to 1 in 19 people in England, 1 in 25 in Scotland and 1 in 13 in Northern Ireland.
- As at 10 February trends in the national mean wastewater surveillance signal appear to be level and consistently low compared with the peak observed at the end of last year, with indications of some rises in West Wales. Analysis of mutations associated with variants of concern indicate that Omicron is dominant across Wales, while Delta is still being detected at many sites.
- As at 6 February estimates by the Zoe COVID Study suggest that the number of daily new cases has increased to 206-257, with a reproduction number of 1.1 (95% CI 1.0-1.2). Zoe prevalence rates for Wales are estimated to be 2816 per 100,000 people, or 1 in 36.

PHW: Cases per 100k, Sept 2020 – 5 Feb 22

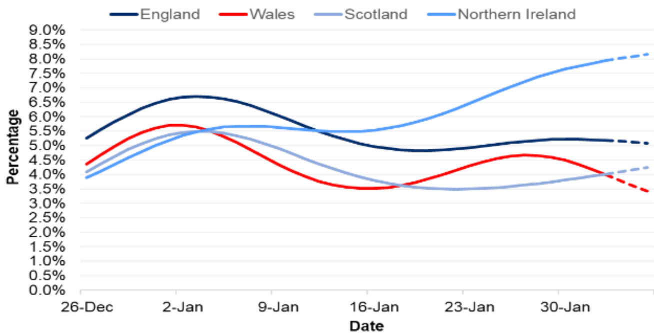
PHW: Cases by age per 100k, 5 Dec – 6 Feb



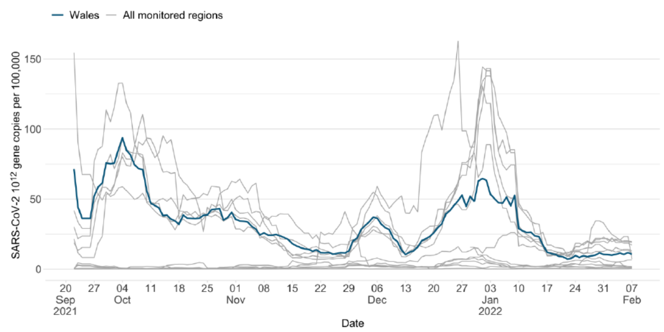
ONS: Wales, estimated % testing positive, 31 Jul 2020 – 5 Feb 2022



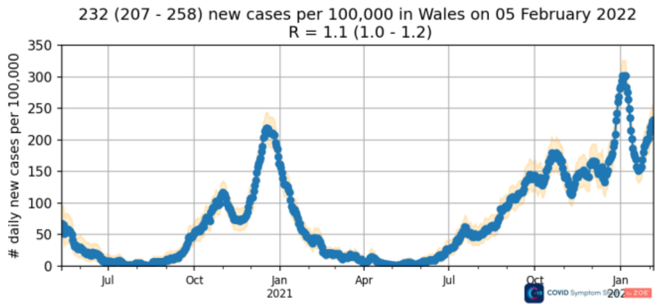
ONS: Positivity rates (%) across UK countries, 26 Dec 2021 to 5 Feb 2022



WG: Wales wastewater monitoring, 20 Sept 2021 - 10 Feb 2022



Zoe COVID Study: Daily incidence rates, Wales, Jun 2021 – 5 Feb 2022



- Lateral flow test (LFT) surveillance by PHW shows the number of LFTs reported decreased from 383,940 in the previous week to 343,958 in the latest reporting week. The number of positive testing episodes decreased from 23,066 in the previous week to 18,690 in the latest reporting week (9 February). The episode positivity rate decreased from 11.87% in the previous week to 10.24% in the latest reporting week. Hywel Dda recorded the highest incidence rate of 680.2 positive testing episodes per 100,000 population. Swansea Bay recorded the highest episode positivity of 11.59%.The Under 20 age group recorded the highest episode positivity rate of 18.05%, a notable decrease from the 23.53% positivity rate reported for the previous week. This is an experimental report, therefore figures and trends should be interpreted with caution. Source: [LFT Public Weekly Report .pdf (wales.nhs.uk)]

- As at 8 February the total number of COVID patients occupying a hospital bed have increased, with the total at 1101- this is 33 (3%) higher than last week. The number of confirmed COVID patients in hospital has decreased to 545- 67 (12%) lower than the same day last week. There were 883 patients at our acute hospital sites today with COVID of which 320 (36%) were actively being treated for COVID.

- COVID related patients occupying a critical care bed have continued to reduce to 18- 8 lower than last week and the lowest number since the 17th July 2021. The total occupied core and surge beds in a critical care environment was 168, this is 16 higher than the pre-COVID baseline of 152 for critical care beds and 3 higher than the same day last week.

- PHW reports the 7 day rolling sum of COVID-19 deaths has remained stable at 46 during the most recent 7-day period ending 4 February, compared to 47 for the same day last week. Note that PHW death data is limited to deaths in Welsh hospital or care home residents where COVID-19 has been confirmed with a positive test and a clinician suspects this was a causative factor in death.

- ONS reports that in the week ending 28 January the number of deaths involving COVID-19 registered in Wales decreased to 60, compared to 102 the previous week. Of the deaths involving COVID-19 for England and Wales in this period, 71.2% had this recorded as the underlying cause of death. The total number of deaths registered in Wales for this period was 729; this was 14 fewer deaths than the previous week and 12.4% below the five-year average (103 fewer deaths). Compared with the 2015 to 2019 (pre-pandemic) five-year average, deaths in Wales were 9.1% below average (73 fewer deaths).

- The UKHSA consensus estimate of the reproduction number (R) for Wales is between **0.8 and 1.0** and a growth rate time of **halving every 20 days to flat** (more than 40 days doubling) as at 10 January 2022. UKHSA estimate R in England as between 0.8 to 1.0, Scotland 0.8 to 1.0 and Northern Ireland 0.9 to 1.1.

- As at 9 January PHW's estimate of R for Wales is **0.85** (0.83 to 0.86) with a **halving time of 31 days** (-56 to 12). UKHSA's estimate of the reproduction number is typically lagged by 2-3 weeks while PHW, which uses a different methodology, is lagged by around 1 week.

- As at 22:00 8 February 2022, a total of 6,800,038 (**+23,642** compared to previous week) doses of COVID-19 vaccine were given in Wales and recorded in the COVID-19 Welsh Immunisation System. 2,515,083 **(+3,389**) were first doses. 2,374,132 **(+4,600**) were second doses, 1,856,566 (**+15,307**) were booster doses and 54,257 (**+346**) were third dose primary courses for immunosuppressed individuals. Source: PHW.

- PHW's monthly COVID-19 vaccination equality report for January 2022 is available here. Overall reduction of gaps in coverage of two doses of vaccine has slowed in recent months and there remain considerable inequality gaps by sex and deprivation quintile in coverage of booster doses. Coverage varies between individual ethnic groups, with lowest coverage currently in the 'Unknown', Black African, Black Caribbean and Mixed groups. Inequality gaps in vaccine coved between the most and least economically deprived populations in Wales remain stable or slightly decreasing in most age groups, but have increased in younger age groups.

- Vaccination coverage at the time of delivery in pregnant women delivering in the latest month has improved considerably but remains lower than in the general population. However, coverage continues to increase after delivery. Of the women delivering in December 2021, 57.7% were vaccinated with at least one dose at the time of delivery and 47.8% had two doses. Ten percent had received a booster.

- As at 2 February 2021, Wales has had 59,461 confirmed cases of the **Omicron** BA.1 variant (+**10,441** from the previous week), 94 cases of Omicron BA.2 **(+0)**, 91,049 cases of **Delta** (+**41**) 14,996 cases of **AY.4.2** (**+29**) and 12,444 cases of **Alpha (+1)**. No other variants of concern were confirmed by genomic sequencing in Wales.

- The most recent PHW weekly Influenza and Acute Respiratory Infection report dated 9 February reports that although influenza is not yet circulating widely according to surveillance indicators, confirmed case numbers have continued to increase. Confirmed cases of Respiratory Syncytial Virus (RSV) in children remain at baseline levels. Rhinovirus and adenovirus cases have increased and are the most commonly detected cause of non-COVID-19 Acute Respiratory Infection (ARI).

- PHW's public engagement survey data reports that 38% of people said they understood the current restrictions in place in Wales to reduce the spread of coronavirus 'very well' and 44% 'quite well'. 15% responded 'not very well' and 4% 'not at all'. 47% of people said they had been following the restrictions 'completely' and a further 38% reported mostly complying. 49% of people said they had taken a lateral flow test in the past 7 days. 67% of people thought the restrictions in place to manage coronavirus were 'about right'. However, 34% thought they were 'too much', an increase from 12% in December 2021. The remaining 8% thought the restrictions were 'too little'. 85% of people said they supported the continued requirement for face coverings in shops and other indoor public places in Wales. However 13% said they did not, an increase from 5% in December 2021. The remainder were unsure.
- Google mobility data as at 9 February suggests in the most recent week public transport mobility increased marginally to -32.4% below the baseline. Residential (i.e. people spending time at home) remains stable at 5.8% below the baseline. Retail & recreation mobility increased marginally to -9.2% below the baseline. Supermarkets & pharmacy remain stable at 4.4% below the baseline. Workplaces increased marginally to -19.2% below the baseline.

SAGE 104, 10 February 2022

Academics: Viral Evolution Scenarios, 10 February 2022

- A note from SPI-M members to SAGE sets out four scenarios (not predictions), ranging from reasonable best case to reasonable worst case, to illustrate possible courses of the SARS-CoV-2 pandemic over the next 12-18 months. All assume that SARS-CoV-2 will continue to circulate for the foreseeable future and that variants will emerge.
- The scenarios differ principally in the impact of individual waves (reflecting the transmissibility and severity of the associated variants) as well as their frequency and timing. The interaction of SARS-CoV-2 with other respiratory viruses such as influenza and RSV may play a significant role in determining outcomes and impacts.
- The availability and effectiveness of vaccines and therapeutics will also have a large impact on outcomes. It is likely that any significant new variant will spread and reach a peak of infections more quickly than a new vaccine can be produced, tested, and distributed at scale.
- Protective behaviours are expected to continue to play an important role in reducing transmission, but cannot be reliably predicted for future waves. Similarly, access to testing has also been key for reducing transmission in previous waves and future access is likely to impact the shape and duration of any future waves.
- Under a central optimistic scenario, the UK sees a seasonal wave of infections in Autumn/Winter with comparable size and realised severity to the current Omicron wave. The general pattern is of annual seasonal infection with good and bad years, the latter with high transmissibility and intrinsic severity similar to Delta. Voluntary protective behaviours are high during waves. Some countries impose NPIs (e.g., face coverings) in bad years. Anti-viral resistance begins to appear and limits use until combination therapies become available.

- Under a central pessimistic scenario, emergence of a new variant of concern results in a large wave of infections, potentially at short notice and out of Autumn/Winter. However, severe disease and mortality remains concentrated in certain groups (and lower than pre-vaccination), e.g. unvaccinated, vulnerable, and elderly. Existing immunity and updated vaccines continue to provide good protection against the most severe outcomes. Although no more severe, repeated waves of infection cause widespread disruption with disproportionate impacts in some groups, e.g., children in education.

- Further details on the scenarios outlined are below:

Scenario 1: Reasonable Best-Case			
Transmissibility	Immune escape	Intrinsic severity	Realised severity
Narrative: Further variants emerge but there is no major antigenic evolution, gains in transmissibility, or a return to Delta-level intrinsic severity. Minimal further escape from current vaccines and infection-induced immunity. Minor seasonal/regional outbreaks from waning immunity and minor antigenic change. Existing vaccines used annually to boost vulnerable only. Antivirals have a significant impact on mortality and morbidity and remain effective. Years with higher SARS-CoV-2 waves tend to have fewer influenza cases.			
In the next 12-18 months: Comparatively small resurgence in Autumn/Winter 2022/23 with low levels of severe disease.			
Scenario 2: Central Optimistic			
Transmissibility	Immune escape	Intrinsic severity	Realised severity
Narrative: Increasing global immunity leads to generally lower realised severity. Waves of infection are driven by cycles of significant waning immunity and/or the emergence of new variants either from Omicron or other lineages. The general pattern is of annual seasonal infection with good and bad years, the latter with high transmissibility and intrinsic severity similar to Delta. Severe illness and mortality largely limited to vulnerable, elderly, and those without prior immunity. Annually updated vaccines given to vulnerable all years and to others in bad years. Voluntary protective behaviours are high during waves. Some countries impose NPIs (e.g., face coverings) in bad years. Anti-viral resistance begins to appear and limits use until combination therapies available.			
In the next 12-18 months: Seasonal wave of infections in Autumn/Winter with comparable size and realised severity to the current Omicron wave.			
Scenario 3: Central Pessimistic			
Transmissibility	Immune escape	Intrinsic severity	Realised severity
Narrative: High global incidence along with increasing population immunity drives unpredictable emergence of variants for many years with a combination of enhanced immune evasion and greater transmissibility relative to Omicron, sometimes more than once per year and/or intrinsic severity similar to Delta in bad years. Existing immunity and updated vaccines continue to provide good protection against the most severe outcomes. Although no more severe, repeated waves of infection cause widespread disruption with disproportionate impacts in some groups, e.g., children in education. Widespread annual vaccination with updated vaccines. Antiviral resistance widespread. SARS-CoV-2 waves do not reduce influenza; SARS-CoV-2 waves overlap leading to further burdens on healthcare. Limited voluntary protective behaviours during waves. Some countries impose more significant NPIs in bad years.			
In the next 12-18 months: Emergence of a new variant of concern results in a large wave of infections, potentially at short notice and out of Autumn/Winter. However, severe disease and mortality remains concentrated in certain groups (and lower than pre-vaccination), e.g. unvaccinated, vulnerable, and elderly.			

Scenario 4: Reasonable Worst-Case			
Transmissibility	Immune escape	Intrinsic severity	Realised severity
Narrative: High global incidence, incomplete global vaccination, and circulation in animal reservoirs leads to repeated emergence of variants, including through recombination (exchange of genetic material between different variants infecting the same cell). Not all variants are equally challenging, but some show significant immune escape with respect to immunity from vaccines and prior infection. Unpredictable changes in how the virus causes disease alters the rate and age profile of severe disease and mortality, with increased long-term impacts following infection. Widespread annual vaccination with updated vaccines is required. Antiviral resistance widespread. Voluntary protective behaviours are largely absent and/or source of societal conflict. Significant use of NPIs is needed, especially when new variants outpace vaccine updates (and/or testing technologies fail).			
In the next 12-18 months: This leads to a very large wave of infections with increased levels of severe disease seen across a broad range of the population, although the most severe health outcomes continue to be felt primarily among those with no prior immunity.			

- Full paper: Academics: Viral Evolution Scenarios, 10 February 2022 - GOV.UK (www.gov.uk)

SPI-B note on social and behavioural impacts of lifting restrictions, including testing and self-isolation, February 2022

- In the event of remaining restrictions being lifted, policy makers and communicators should seek to mitigate potential economic and social harms to those identifying as clinically vulnerable and those from deprived socio-economic and minority groups. They should consider unintended consequences of any changes to current provision of testing.
- Removal of free access to testing will make it more difficult for people experiencing Covid-19 symptoms to confirm infectiousness and take actions (including self-isolation) to reduce transmission to others. Especially in the short term, these changes may increase anxiety among some people and limit their social participation outside the home, particularly those who are, or who live with, someone who is clinically vulnerable [Medium confidence].
- If the legal requirement to self-isolate upon testing positive is lifted and becomes an item of public health guidance, it is likely to lead to further ambiguity among the public about the need for strict adherence. This will disproportionately impact vulnerable sections of the population, for example those who face greater pressure to work outside the home when ill because of financial hardship, precarious employment, or caring responsibilities.
- Other countries' efforts to reduce rates of infectious illness through improved sick pay have proved effective. There is scope to trial this in the UK and other ways to help people to stay at home when infectious.
- Protective behaviours developed during the pandemic can easily reduce or cease if not promoted longer term. As perceptions of personal risk decline, messaging should continue to set out the importance of continued adherence to specific protective measures as well as the rationale for lifting restrictions. Messaging should emphasise voluntary adherence as a contribution to collective wellbeing, as well as the continuing risks for some groups.
- Messaging on safe behaviours should stress recognition of the different risks, needs and risk appetites of others to help prevent abusive incidents, social tensions, and

stigma towards minority groups. Far-right and anti-vax groups have successfully tapped into existing social tensions and will continue to do so [High confidence]

- Lifting remaining restrictions provides an opportunity to forge a new narrative about maintaining safe behaviours. The legitimacy of narratives may well be increased if the loss and trauma of the pandemic is acknowledged alongside messages about a return to normality.
- Any communications should use a range of channels to increase reach and accessibility of communications. There is an important role for community champions in communicating public health advice.
- Cross-national studies have shown that people have higher confidence in health advice from health professionals and scientists compared to politicians. Now may be an optimal time to shift responsibility for messaging from central government to public health and NHS agencies [High confidence]. However, it is important that cross-Government departments remain consistent in their Covid-related communications, to avoid undermining health-led messaging.
- Policy makers need to recognise that adherence will be harder for some individuals as the legislative and normative environment changes.
- Adherence can be promoted by ensuring institutions and environments are supportive. Organisations (e.g. workplaces) should be encouraged and enabled to decide and enact proportionate measures in consultation with local public health staff.
- Full paper: SPI-B: Social and behavioural impacts for lifting remaining restrictions, 10 February 2022 - GOV.UK (www.gov.uk)

COVID-19 evidence - round-up

This section aims to highlight 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.

SARS-CoV-2 Variants and vaccine effectiveness

UKHSA vaccine surveillance report

- In an updated COVID-19 vaccine surveillance report, UKHSA report on vaccine effectiveness (VE) against symptomatic disease, hospitalisation and mortality for up to 15 weeks after a booster.
- For VE against symptomatic disease, after two doses of the AstraZeneca vaccine, VE against Omicron drops to almost no effect from 20 weeks after the second dose.
- Two to four weeks after a booster dose, VE against symptomatic disease is restored to 60-75% but drops to 25-40% from 15+ weeks after the booster. VE is similar for

both booster vaccines, irrespective of primary course, however it is slightly higher in younger people.

- For VE against hospitalisation, after two doses of the AstraZeneca vaccine, vaccine effectiveness against hospitalisation with the Omicron variant drops to 30% at 25 weeks, albeit with wide confidence intervals. Two to 4 weeks after a booster dose, effectiveness is restored to 90% for both mRNA booster vaccines – but by 10 weeks the effectiveness falls to 80% for a Pfizer booster. The follow-up for Moderna booster is shorter but shows good effectiveness at around 90% at 5-9 weeks.

Figure 1. Vaccine effectiveness against symptomatic disease by period after the second and booster doses for Delta (black squares) and Omicron (grey circles) for a) recipients of 2 doses of Astrazeneca (ChAdOx1-S) vaccine as the primary course and Pfizer (BNT162b2) or Moderna (mRNA-1273) as a booster; b) recipients of 2 doses of Pfizer vaccine as the primary course and Pfizer or Moderna as a booster, and c) 2 doses of Moderna as a primary course and Pfizer or Moderna as a booster

a)

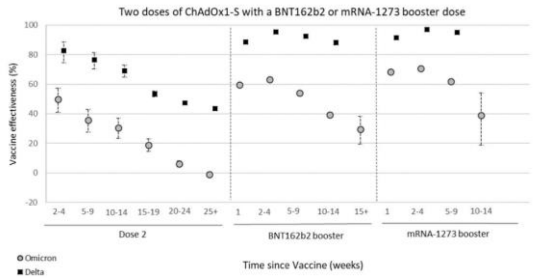
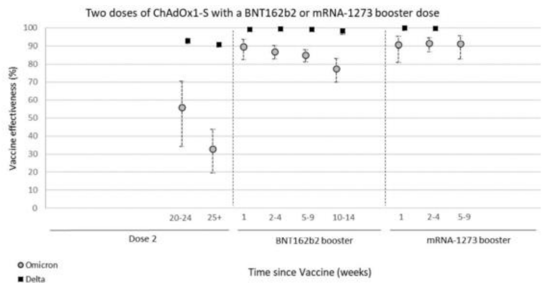


Figure 2. Vaccine effectiveness against hospitalisation by period after the second and booster doses for Delta (black squares) and Omicron (grey circles) for a) recipients of 2 doses of Astrazeneca (ChAdOx1-S) vaccine as the primary course and Pfizer (BNT162b2) or Moderna (mRNA-1273) as a booster; b) recipients of 2 doses of Pfizer vaccine as the primary course and Pfizer or Moderna as a booster

a)



- Full paper: [COVID-19 vaccine surveillance report - week 5 (publishing.service.gov.uk)]

Protection of 4th dose for infection and severe illness against Omicron in Israel

- On January 2, 2022, Israel began administering a fourth dose of the Pfizer-BioNTech vaccine to people aged over 60 years and at-risk populations, who had received a third dose of vaccine at least 4 months earlier. This study uses Israeli healthcare data for 1.1million people aged 60+ and eligible for a fourth dose to compare the rate of confirmed Covid-19 and severe illness between those who received a fourth dose at least 12 days earlier, those who had received only three doses, and those 3 to 7 days after receiving the fourth dose.

Overall rates of confirmed Covid-19 and severe illness were lower following a fourth dose compared to only three doses. The rate of confirmed infection was lower in people 12 or more days after their fourth dose than among those who received only three doses and those 3 to 7 days after vaccination by factors of 2.0 and 1.9 respectively. The rate of severe illness was lower by factors of 4.3 (95% CI, 2.4 to 7.6) and 4.0 (95% CI, 2.2 to 7.5).

- Full paper: [Protection by 4th dose of BNT162b2 against Omicron in Israel | medRxiv]

PREPRINT: Transmission of SARS-CoV-2 Omicron VOC subvariants BA.1 and BA.2: Evidence from Danish Households

- A study of infectivity and transmission of Omicron subvariants in Danish households found BA.2 to be associated with a more than doubled risk of infection for unvaccinated individuals (Odds Ratio (OR) 2.19; 95%-CI 1.58-3.04), fully vaccinated individuals (OR 2.45; 95%-CI 1.77-3.40) and booster-vaccinated individuals (OR 2.99; 95%-CI 2.11-4.24), compared to BA.1.

- There was also evidence of increased transmission from unvaccinated primary cases in BA.2 households when compared to BA.1 households, with an OR of 2.62. The pattern of increased transmissibility in BA.2 households was not observed for fully vaccinated and booster-vaccinated primary cases, where the OR of transmission was below 1 for BA.2 compared to BA.1.

- The authors conclude that Omicron BA.2 is inherently substantially more transmissible than BA.1, and that it also possesses immune-evasive properties that further reduce the protective effect of vaccination against infection, but do not increase its transmissibility from vaccinated individuals with breakthrough infections.

- Full paper: [Transmission of SARS-CoV-2 Omicron VOC subvariants BA.1 and BA.2: Evidence from Danish Households | medRxiv]

PREPRINT: Safety, tolerability and viral kinetics during SARS-CoV-2 human challenge

- A pre-print study reports on the results of a human challenge trial where 36 volunteers aged 18-29 years without evidence of previous infection or vaccination were inoculated with wild-type SARS-CoV-2 via the nose. Participants were admitted to an in-patient unit with 24-hour monitoring and access to clinical support if needed. Twice-daily nose and throat samples were taken and tested using PCR and lateral flow tests. Focus Forming Assays (FFA) were used to assess viable virus.

- Eighteen participants (~53%) became infected, with viral load (VL) rising steeply and peaking at ~5 days post-inoculation. Virus was first detected in the throat but rose to significantly higher levels in the nose, peaking at ~8.87 log10 copies/ml (median, 95% CI [8.41,9.53). Viable virus was recoverable from the nose up to ~10 days post-inoculation, on average. There were no serious adverse events. Mild-to-moderate symptoms were reported by 16 (89%) infected individuals, beginning 2-4 days post-inoculation. Anosmia/dysosmia developed more gradually in 12 (67%) participants. No quantitative correlation was noted between VL and symptoms, with high VLs even in asymptomatic infection, followed by the development of serum spike-specific and neutralising antibodies. However, lateral flow results were strongly associated with viable virus and modelling showed that twice-weekly rapid tests could diagnose infection before 70-80% of viable virus had been generated.

- Thus, in this first SARS-CoV-2 human challenge study, no serious safety signals were detected and the detailed characteristics of early infection and their public health implications were shown. As a result, further challenge studies are now underway that will allow rapid evaluation of vaccines, antivirals and diagnostics by generating efficacy data early during clinical development and avoiding the uncertainties of studies that require ongoing community transmission.

- Full paper: [Safety, tolerability and viral kinetics during SARS-CoV-2 human challenge | Research Square]

Immunity

T-cell reactivity to the SARS-CoV-2 Omicron variant is preserved in most but not all individuals

- While antibodies block infection, T cells come in and kill infected cells, preventing the virus from growing & spreading more & causing worse disease. T cells do not prevent infection, because they kick into action only after a virus has infiltrated the body. But they are important for clearing an infection that has already started.
- The SARS-CoV-2 Omicron variant contains mutations that mediate escape from antibody responses, although the extent to which these substitutions in spike and non-spike proteins affect T-cell recognition is unknown. This study shows that T-cell responses in individuals with prior infection, vaccination, both prior infection and vaccination, and boosted vaccination are largely preserved to Omicron spike and non-spike proteins.
- In contrast to neutralizing immunity, these findings suggest preservation of T-cell responses to the Omicron variant; however reduced reactivity was observed in a subset (~21%) of individuals with a >50% reduction in T-cell reactivity to the Omicron spike and this will require future follow up. T-cell responses were also enhanced by booster vaccination, although a smaller subset (~9%) of participants still demonstrated >50% reduced reactivity to Omicron spike relative to wild-type.
- Full paper: T-cell reactivity to the SARS-CoV-2 Omicron variant is preserved in most but not all individuals: Cell

PREPRINT: Durability of Omicron-neutralizing serum activity following mRNA booster immunization in elderly individuals

- This study examines SARS-CoV-2-neutralizing serum activity against different variants in a cohort of 37 individuals with a median age of 82 years. Participants were followed for 10 months after an initial two-dose Pfizer vaccination and up to 4.5 months after a Pfizer booster. Detectable Omicron-neutralizing activity was nearly absent after two vaccinations but elicited in 89% of individuals by the booster immunization. Neutralising titres against the Wu01, Delta, and Omicron variants showed similar post-boost declines and 81% of individuals maintained detectable activity against Omicron.
- The results demonstrate that although antibody levels wane significantly after 2 doses, these return with a booster vaccination and, importantly, are maintained for longer and at a higher base level in a highly vulnerable elderly population.
- Full paper: Durability of Omicron-neutralizing serum activity following mRNA booster immunization in elderly individuals | medRxiv

Coronavirus (COVID-19) latest insights for Wales: Antibodies

- The latest insights from ONS' antibody study as at the week beginning 3 January 2022 shows that adult antibodies at the ONS' standard threshold for protection[1] or

[1] See here for details about unit measurement

higher are around 98% across all 4 UK nations. Following previous evidence of antibody waning in those aged 50+ from May to September 2021, there has been a rapid increase in antibody levels that suggest higher protection across the UK among those aged 50+ since early October 2021, likely as a result of the vaccination booster programme.

- The survey also includes the percentage of adults (16+) positive for antibodies at or above the higher threshold by age groups in Wales, showing that levels are similar across all ages at between 92 and 99%.
- Similar data for ages 8 to 11 shows that in Wales 53.3% are estimated to test positive at the standard threshold, compared to 88% for ages 12 to 15 years. For the higher antibody concentration threshold, 28.5% of 8 to 11 year olds are estimated to test positive, compared with 80.4% of 12 to 15 year olds. 68.5% of children aged 12 to 15 have received at one or more vaccinations and 13.7% have received two doses, while under 12s remain largely unvaccinated.
- Full paper: [Coronavirus (COVID-19) latest insights - Office for National Statistics (ons.gov.uk)]

Coronavirus (COVID-19) Infection Survey, characteristics of people testing positive for COVID-19, UK: 2 February 2022

- Another analysis from COVID Infection Survey data shows an increase in COVID-19 reinfections since Omicron became the dominant variant. The viral load in an individual's second infection, when the second infection was in the Delta or Omicron period, was also higher (using a lower PCR CT value as a proxy) compared to their first infection.
- There were similar percentages of people reporting symptoms when their second infection was either in the Delta or Omicron dominant periods.
- The risk of symptoms in an individual's second infection, when the second infection was in the Delta period, was 1.69 times higher (95% confidence interval: 1.22 times to 2.34 times) compared to their first infection.
- There was no difference in the risk of symptoms in an individual's second infection, when the second infection was in the Omicron period compared to their first infection.
- Full paper: [Coronavirus (COVID-19) Infection Survey, characteristics of people testing positive for COVID-19, UK - Office for National Statistics]

<u>Ethnicity</u>

PREPRINT: The public views of and reactions to the COVID-19 pandemic in England- a qualitative study with diverse ethnicities

- In this preprint interview study carried out in England, surveying 100 participants from 19 self-identified ethnic groups, dismay, frustration and altruism were reported across all ethnic groups during the first six to nine months of the COVID-19 pandemic. Dismay was caused by participants' reported individual, family and community risks, and loss of support networks. Frustration was caused by reported lack of recognition of the efforts of minority ethnic groups (MEGs), inaction by government to address COVID-19 and inequalities, rule breaking by government advisors, changing government rules around: border controls, personal protective equipment, social distancing, eating out, and perceived poor communication around COVID-19 and the Public Health England (PHE) COVID-19 disparities report (leading to reported increased racism and social isolation). Altruism was felt by all, in the resilience of NHS staff and their communities and families pulling together. Data, participants suggested actions, and the Behaviour Change Wheel informed suggested interventions and policies to help control COVID-19.

- To maintain public trust, the authors state it is imperative that governmental bodies consider vulnerable groups, producing clear COVID-19 control guidance with contingency, fiscal, service provision and communication policies for the next rise in COVID-19 cases. This needs to be combined with public interventions including information, education, modelling and enablement of infection prevention through local community involvement and persuasion techniques or incentivisation. Government policy needs to review and include town and social planning leading to environmental restructuring that facilitates infection prevention control. This includes easy access to hand-washing facilities in homes, work, all food providers and shopping centres; toilet facilities as our Travellers mentioned, and adequate living accommodation and work environment facilitating IPC for all.
- Full paper: [The public views of and reactions to the COVID-19 pandemic in England- a qualitative study with diverse ethnicities | medRxiv]

A population-based cohort study of obesity, ethnicity and COVID-19 mortality in 12.6 million adults in England

- A study of linked data sources in England analysing the combined impact of obesity and ethnicity on COVID-19 outcomes from January 2020 to December 2020 has shown that Body Mass Index (BMI) was more strongly associated with COVID-19 mortality in ethnic minority groups than among those of white ethnicity, with South Asian ethnicities at greatest risk. For all ethnic minority groups, mortality rates are higher and the gap relative to mortality for those of white ethnicity widens with increasing BMI. The study also found similar associations when looking at risk of hospitalisation.
- The study made use of linked 2011 Census data, electronic health records and mortality datasets. 12.6 million adults aged 40 and older at 31 December 2019 whose health records included a BMI measure were included in the study. 33,951 COVID-19 deaths and 100,003 hospitalisations were recorded among these individuals. The study adjusted for socio-demographic data and comorbidities.

  The authors report that reasons underpinning the observed interactions between ethnicity and obesity are unclear. A possible explanation is that ethnic minority groups may have a stronger innate inflammatory response to viral infection or chronic disease and the presence of greater levels of morbid obesity interacts with and accelerates this inflammatory response. The authors state these results emphasise the importance of public health messages to reduce levels of obesity within the population, particularly within ethnic minority groups and that future work is needed to investigate how these risk factors interact with post COVID-19 vaccination infection and mortality risk.

- Full paper: A population-based cohort study of obesity, ethnicity and COVID-19 mortality in 12.6 million adults in England | Nature Communications

Updating ethnic contrasts in deaths involving the coronavirus (COVID-19), England: 8 December 2020 to 1 December 2021

- An ONS analysis shows that since the vaccination programme began, the risk of death from COVID-19 has continued to be higher in most ethnic minority groups than in the White British ethnic group. These differences in mortality are largely explained by socio-demographic and economic factors and health inequalities. Lower vaccination coverage in some ethnic groups also contributes to the elevated risk of COVID-19 death, particularly in the Black African and Black Caribbean groups.
- Between 8 December 2020 (the start of the vaccination programme) and 12 June 2021 (the approximate end of the second wave of the coronavirus (COVID-19) pandemic), the rate of death involving COVID-19 was highest for the Bangladeshi ethnic group (5.0 times greater than the White British group for males, and 4.5 times greater for females), followed by the Pakistani (3.1 for males, 2.6 for females) and Black African (2.4 for males, 1.7 for females) ethnic groups.
- Since the start of the third wave of the coronavirus pandemic (from 13 June 2021 onwards) the rate of death involving COVID-19 was higher for all ethnic minority groups (except Chinese people, men from the Mixed ethnic group and women from the White other ethnic group); the risk remained highest for the Bangladeshi ethnic group (4.4 and 5.2 times greater than for the White British ethnic group for males and females, respectively).
- Location, measures of disadvantage, occupation, living arrangements, pre-existing health conditions and vaccination status accounted for a large proportion of the excess rate of death involving COVID-19 in most ethnic minority groups; however, the Bangladeshi ethnic group and men from the Pakistani ethnic group remained at higher risk than White British people in the third wave, even after adjusting for vaccination status.
- Updating ethnic contrasts in deaths involving the coronavirus (COVID-19), England - Office for National Statistics (ons.gov.uk)

Pulse oximeters' measurements vary across ethnic groups: An observational study in patients with Covid-19 infection

- Pulse oximetry is a non-invasive test used to estimate the oxygen saturation of the blood without using needles or taking a blood sample. This analysis extends previous concerns around pulse oximeters giving a falsely high reading in patients with Black ethnicity to patients with Asian ethnicity as well. This is important, as high levels of skin pigmentation are associated with the ethnic groups who have a poorer outcome from Covid-19 infection, and hence would require the most accurate oxygen measurements available to titrate supplemental oxygen and deliver timely treatment. Although these data cannot quantify the impact of these measurement errors of pulse oximetry on clinical care, the authors' experience is that any delay in appreciating the severity of Covid-19 pneumonitis is likely to be detrimental to patient care, especially now that new therapeutic options are becoming available.

- A UK-led review of the health impact of potential bias in medical devices, including pulse oximeters, is currently underway. Publication of initial findings, originally scheduled for January 22, has since been delayed (link).
- Full paper: Pulse oximeters' measurements vary across ethnic groups: An observational study in patients with Covid-19 infection | European Respiratory Society (ersjournals.com)

Testing

PREPRINT: High Rates of Rapid Antigen Test Positivity after 5 days of Isolation for COVID-19

- A US pre-print study analysed Rapid Antigen Test results (more commonly known in the UK as lateral flow tests, or LFTs) conducted among healthcare workers in the US who tested positive, isolated for COVID-19 and then sought to return to work in early January 2022. US guidance at the time provided clearance to exit isolation after 5 days from symptom onset, without the need for a negative rapid antigen test to exit, as long as symptoms are beginning to resolve. For the study those with positive tests on first attempt could return 24-48 hours later to test again for as many days as needed to achieve a negative result or until they completed 10 days of restriction from work.
- Between 2 and 12 January 2022, 43% of all LFT results were positive between days 5-10. 58% of tests on day 6 were positive. These results indicate that a substantial proportion of individuals with COVID-19 are likely still infectious after day 5 of illness, regardless of symptom status.
- Overall more than 40% (134 of 309) of vaccinated HCW who felt well enough to work still had positive LFT tests when presenting for a first test between days 5 and 10. Healthcare workers returning for a first test on day 8 and 9 were less likely to have a positive test (26%, 19/74). HCWs who test positive on their first test most often remained positive on their second test, with 56% of second tests, aggregated across all days 6-10, remaining positive.
- These results indicate that a substantial proportion of individuals with COVID-19 are likely still contagious after day 5 of illness, regardless of symptom status. Early liberation from isolation without a supporting negative LFT should be undertaken only with the understanding that inclusion of individuals on day 6-10 of illness in community or work settings may increase the risk of COVID-19 spread to others which, in turn, may undermine the intended benefits to staffing by resulting in more sick workers. Current Welsh Government guidance is that an individual should self-isolate for 5 days, after which they should exit self-isolation following 2 negative tests on 2 consecutive days.
- Full paper: High Rates of Rapid Antigen Test Positivity After 5 days of Isolation for COVID-19 | medRxiv

Transmission and Environmental science

PREPRINT: Differences in environmental stability among SARS-CoV-2 variants of concern: Omicron has higher stability

- This preprint study analysed differences in viral stability and disinfection efficacy between the Wuhan strain and all VOCs. On plastic and skin surfaces, Alpha, Beta, Delta, and Omicron variants exhibited more than two-fold longer survival than the Wuhan strain, and the Omicron variant had the longest survival time. Specifically, survival times of the Wuhan strain, Alpha variant, Beta variant, Gamma variant, Delta variant, and Omicron variant on skin surfaces were 8.6 hours (h) (95% CI, 6.5–10.9 h), 19.6 h (95% CI, 14.8–25.3 h), 19.1 h (95% CI, 13.9– 25.3 h), 11.0 h (95% CI, 8.1–14.7 h), 16.8 h (95% CI, 13.1–21.1 h), and 21.1 h (95% CI, 15.8– 27.6 h), respectively.
- In natural conditions on human skin, all viruses were completely inactivated by exposure to 35 w/w % ethanol for 15s. The high environmental stability of these VOCs could increase transmission risk and contribute to spread. Additionally, the Omicron variant might have been replaced by the Delta variant due to its increased environmental stability and rapid spread. To prevent VOC spread, it is highly recommended that current infection control practices use disinfectants or hand washes with appropriate ethanol concentrations.
- Full paper: Differences in environmental stability among SARS-CoV-2 variants of concern: Omicron has higher stability | bioRxiv

Modelling

Equitable access to COVID-19 vaccines makes a life-saving difference to all countries

- To explore the consequences of vaccine (in)equity in the face of evolving COVID-19 strains, this study examines vaccine allocation strategies using a multistrain metapopulation model. The results show that vaccine inequity provides only limited and short-term benefits to high-income countries (HICs). Sharper disparities in vaccine allocation between HICs and lower and middle income countries (LMICs) lead to earlier and larger outbreaks of new waves. Equitable vaccine allocation strategies, in contrast, substantially curb the spread of new strains. For HICs, making immediate and generous vaccine donations to LMICs is a practical pathway to protect everyone.
- If HICs donate a certain portion of vaccine supplies to LMICs instead of vaccinating their entire population as the top priority, the modelling suggests enormous public health benefits can be seen for both HICs and LMICs. For HICs, donating a small portion of vaccines to LMICs could better lower the risk of future waves than waiting for the epidemic to be controlled in their own countries. Additionally, donating vaccines to more LMICs rather than only directly neighbouring LMICs is more efficient in curbing the spread of the virus.
- The results also suggest that equitable global vaccine allocation strategies substantially curb the spread of new SARS-CoV-2 strains globally. Assuming that fully vaccinated individuals can be vaccinated again after losing vaccine-induced immunity, prioritizing vaccination for countries with higher prevalence, higher

incidence or higher mortality rates results in similar pandemic outcomes less severe than those under the population-based proportional allocation strategies. This is probably because the model suggests smaller outbreaks lead to fewer immune-escape variants. Many developing countries, which are currently facing high prevalence or incidence, still lack vaccines. Having the third dose certainly improves the effectiveness of the vaccine, but the improvement is less than that of the first vaccination, especially for those countries that need vaccines to lower their high prevalence, incidence or mortality rates.

- Full paper: Equitable access to COVID-19 vaccines makes a life-saving difference to all countries | Nature Human Behaviour
- *Note: a House of Commons research briefing on UK progress to UK and G7 commitments to vaccine donation has recently been published, available here. At the G7 summit in June 2021, the UK Government said it would share 100 million doses over the year to June 2022 and that 80% will be shared via Covax., with the remainder shared bilaterally.*

Socio-economic

PREPRINT: Good work in the COVID-19 recovery: priorities and changes for the future

- This preprint study from Public Health Wales asked working adults in Wales to identify the workforce's priorities for future work, and the employment changes that they have considered making since the start of the COVID-19 pandemic. Data was collected at two time-points (May-June 2020; December 2020-January 2021) in a nationally-representative longitudinal household survey across Wales.
- Work priorities remained largely stable throughout the pandemic, however the desire to work close to home increased as the pandemic progressed. More than a fifth had considered retraining since the onset of the pandemic, and many vulnerable population groups (e.g. those that were furloughed, those with atypical employment, and those with high wage precariousness) were more likely than others to consider changing their employment conditions.
- Those in poorer health prioritised flexibility, and were more likely to consider retiring than their healthier counterparts. Becoming self-employed was more likely to be considered by those with limiting pre-existing conditions or low mental well-being. Over 20% of the total sample had considered retraining, with those with low mental well-being, younger individuals and those experiencing financial insecurity being more likely to consider doing so. Furloughed individuals were more likely to consider retraining, becoming self-employed, securing permanent employment and compressing their working hours.
- Those prone to facing insecurity within their working lives (those that were furloughed, those experiencing financial insecurity, and those in ill-health) were all more likely to consider changing their employment conditions – these groups may require additional support in accessing secure and flexible work. The COVID-19 pandemic has exacerbated societal inequalities, however the recovery phase offers the opportunity to reduce these longstanding inequalities that have become more

visible during the pandemic itself. Action is needed to ensure that good work, that is good for health, is equally accessible for all.

- Full paper: Good work in the COVID-19 recovery: priorities and changes for the future | medRxiv

Behavioural insights and mental health

Challenges to self-isolation among contacts of cases of COVID-19: a national telephone survey in Wales

- Another PHW report suggests that younger people (aged 18–29 years) were three times more likely to report mental health concerns (adjusted odds ratio [aOR]: 3.16, 95% confidence interval [CI]: 2.05–4.86) and two times more likely to report loneliness (aOR: 1.96, CI: 1.37–2.81) compared to people aged over 60 years. Women were 1.5 times more likely to experience mental health concerns (aOR: 1.51, 95% CI: 1.20–1.92) compared to men. People with high levels of income precarity were eight times more likely to report financial challenges (aOR: 7.73, CI: 5.10–11.74) and three times more likely to report mental health concerns than their more financially secure counterparts (aOR: 3.08, CI: 2.22–4.28).

- Overall self-isolation is particularly challenging for younger people, women and those with precarious incomes. Identifying those with precarious incomes and at greatest risk of experiencing mental health harms of self-isolation during initial conversations with contact tracers is a key priority to ensure comprehensive assessment of needs and access to targeted support to help maximize potential adherence to self-isolation during this and future pandemics.

- Challenges to self-isolation among contacts of cases of COVID-19: a national telephone survey in Wales | Journal of Public Health | Oxford Academic (oup.com)