

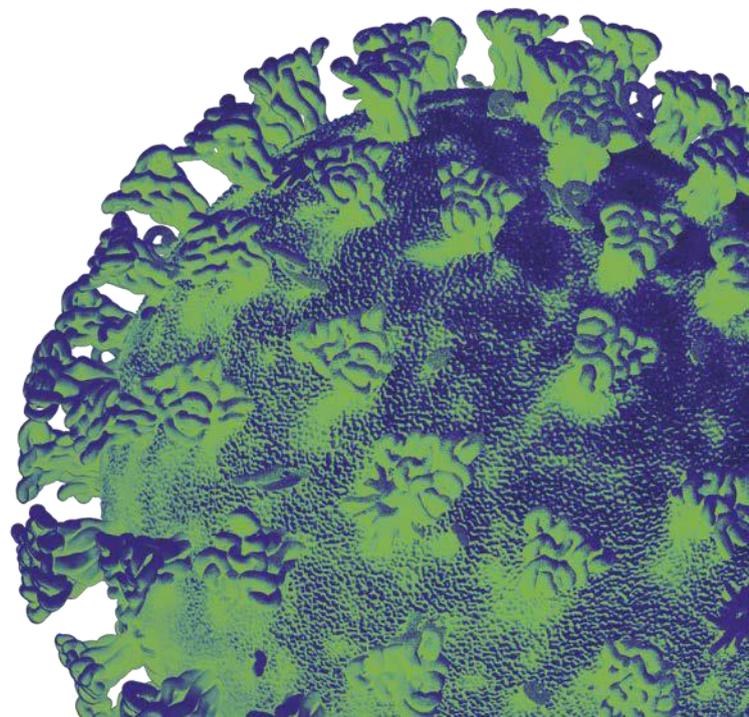
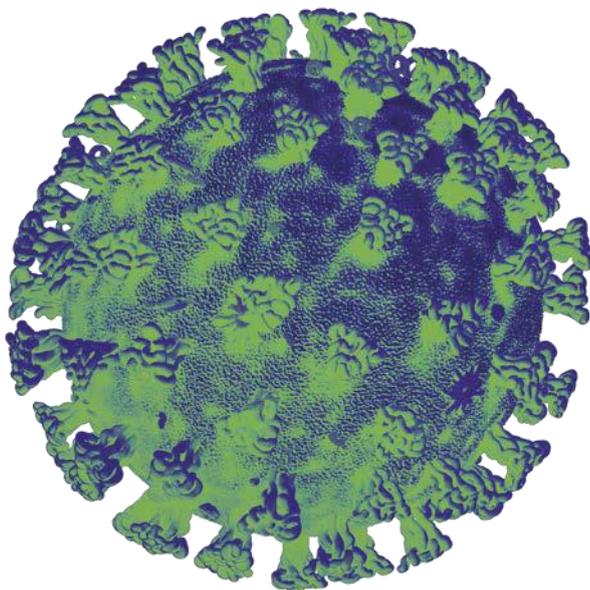
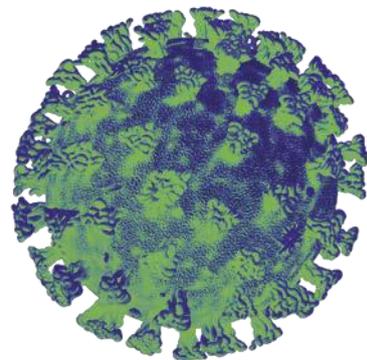


Llywodraeth Cymru
Welsh Government

Technical Advisory Group

Considerations for changing the operation of schools to allow more face-to-face learning

05 February 2021



**Technical Advisory Group: Considerations for changing the operation of
schools to allow more face-to-face learning**

5th February 2021

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Key messages

This note considers three key topics relevant to changing the operation of schools to allow more face-to-face learning.

1. The note considers when might there be any headroom for easements and what criteria might be used. It concludes that:

- The UK is at UK COVID-19 Alert Level 5 since 4th Jan 2021, indicating an ongoing material risk of healthcare services being overwhelmed. Any easements would be likely to increase that risk while the UK remains at that level.
- The circumstances to enable easement of restrictions will require a combination of the following: lower community prevalence and case rates; lower test positivity rates; manageable hospital and ICU occupancy; Rt below 1; evidence of sustainability of a lower level for these indicators, or that rises in these indicators can be responded to swiftly by re-imposing restrictions.

2. The note considers how much headroom will be needed to further reopen schools. It concludes:

- VOC202012/01 is now the dominant variant in Wales, and there is still uncertainty around how much more transmissible this variant is but our understanding is improving.
- This uncertainty means there is not yet the evidence to identify whether further opening schools for face-to-face learning for all students would lead to healthcare in Wales being overwhelmed at this time.
- Decreasing pressure on NHS services before more face-to-face teaching begins would give a greater margin of error if schools operations create societal conditions for the new variant to grow exponentially.
- The health impacts of the vaccination programme should be monitored carefully, lessening of NHS pressures should create more headroom if deaths and hospital admissions are key determinants of relaxation.
- The potential longer-term health impact associated with COVID-19, including 'long-COVID', should be taken into account when relaxing measures.
- The public health management, behaviour and spread of new variants should be carefully considered prior to opening schools for face-to-face education

3. The note considers what models of schools operating would strike a balance between the risks and benefits and what additional NPIs or mitigations would be helpful. It concludes:

- Confirmed case rates among children in Wales aged 11 or younger have consistently been relatively lower than those among older children.
- Confirmed case rates of COVID-19 among most groups of school staff in Wales have been lower than for equivalent groups in the general working age population, and overall teachers in England and Wales have been less at risk of death with COVID-19 than the general working age population.
- A partial and phased return to face-to-face learning in schools should be considered as this is likely to increase rates of transmission less swiftly than a full return. The transition should be monitored carefully before further changes are made.
- Current infection prevention and control measures should be reviewed to consider how these could be strengthened in light of the increased prevalence of a more transmissible variant.
- The impact of these changes on transmission will need to be carefully monitored so that, if necessary, restrictions can be re-imposed swiftly.
- The educational and well-being benefits of a partial, phased or staggered return for different groups of pupils need to be considered carefully.
- It will be important to consider a longer planning horizon for changes to the operation of schools, especially relating to equality and consistency of educational experience and outcomes.

Background

Wales moved to alert level 4 on 20 December 2020. This followed the closure of secondary schools after 11 December. On 4 January 2021, following advice from the Joint Biosecurity Centre and the four UK Chief Medical Officers, the UK moved to UK COVID-19 Alert Level 5 as without further action there was a material risk of the NHS in several areas being overwhelmed within 21 days¹. On the same day, it was confirmed that all schools would be providing remote learning for all children except for vulnerable children and children of critical workers, until at least 18 January. On 8 January, the First Minister said that unless there is a significant reduction in cases of coronavirus before the review ahead of 29 January, schools in Wales will continue with this model of provision until the February half term.² According to the most

¹ [UK COVID-19 Alert Level methodology: an overview](#)

² [Written Statement: Secondary schools and colleges in Wales will move to online learning from Monday 14 December 2020 as part of the national effort to reduce coronavirus transmission](#)

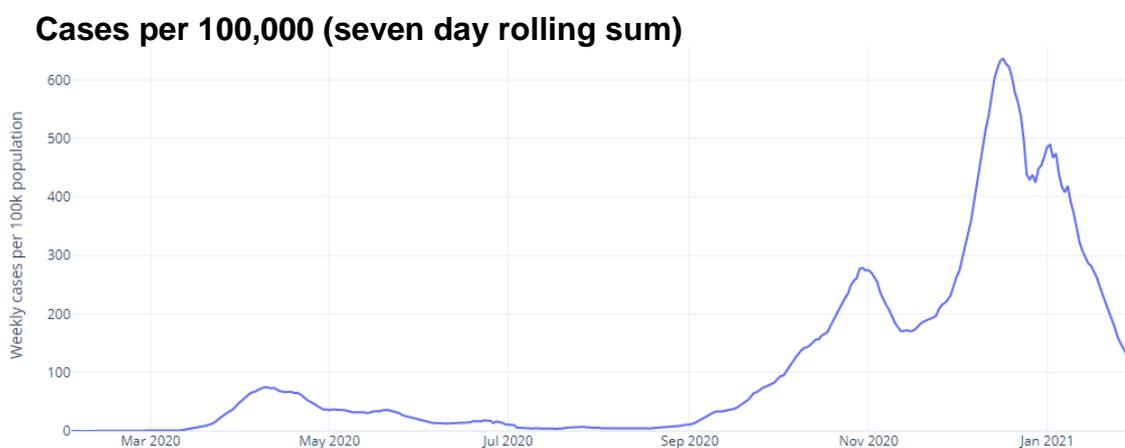
recent provisional figures, an average of 8.2% of pupils were physically present in schools over the week of 25 January to 29 January, up from an average of 7.3% for the previous week.³

1. When might there be headroom for any easements and what criteria might be used?

Indicators

Welsh Government uses four alert levels for public response to threat levels, that require measures designed to control the spread of the virus and protect people's health. The current alert level is aligned to key indicators relating to the state of coronavirus across Wales.⁴ While schools moving to operating remotely for most learners was not part of the planned approach for the alert levels, the indicator measures for the alert levels were designed to assess the level of risk posed by the spread of coronavirus at a particular point in time. Some measures indicate that the existing restrictions have had an impact since they were introduced:

- Since 8 January 2021 the rate of confirmed cases per 100,000 people rolling seven-day average has been falling. Since 14 January this has been below 300 per 100,000 which is an indicator for alert level 3 and it has been declining in the weeks since (see the chart below).



Source data: Public Health Wales (PHW), as at 1 February 2021

[Written Statement: Alert level four restrictions](#)

[A joint statement from the UK CMOs recommending that the UK COVID-19 Alert Level move from Level 4 to Level 5](#)

[Written Statement: Return to school and college arrangements](#)

[Written Statement: Review of the Health Protection \(Coronavirus Restriction\) \(No.5\) \(Wales\) Regulations 2020](#)

³ [Pupils present in maintained schools](#), 7 September 2020 to 29 January 2021. This information is provisional and will be revised on 10 February.

⁴ [Coronavirus Control Plan: Alert levels in Wales](#) (14 December 2020).

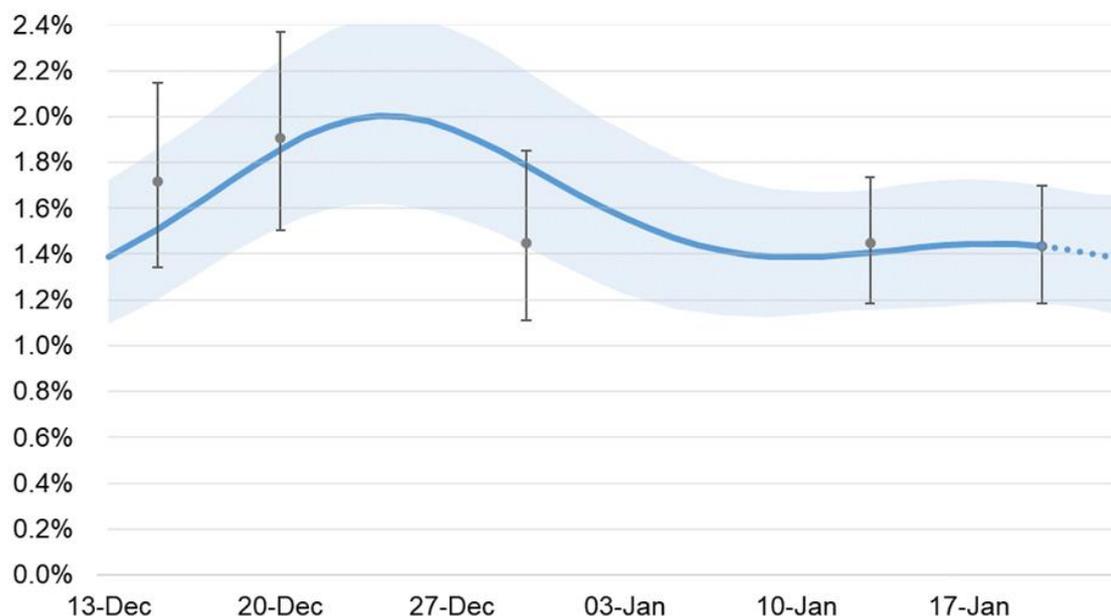
- The most recent estimate of the Reproduction number (Rt) for Wales from SAGE (approved by SAGE on 28 January) is between 0.7 and 0.9. This is the official estimate of the Rt number for Wales based on data available up until 25 January. SAGE estimates that the epidemic is shrinking by between -6% and -1% per day.

However, other measures would still point to the need to maintain alert level 4 restrictions. Measures that would still indicate the need for alert level 4 include:

The test positivity rate is above 10% over seven days. For the 7 day period ending 30 January, test positivity (rolling 7 days) was 10.9%, which has decreased since last week, but remains high. For the 7 day period ending 28 January test positivity was above the red circuit breaker (5%) in all areas of Wales, apart from Ceredigion. Positivity remained highest in the North Wales areas of Wrexham (21.8%) and Flintshire (16.5%).⁵

- *The forecast of the Welsh population estimated to have COVID-19 is more than 1%.* Data from the ONS COVID-19 infection survey⁶ (the surveillance study that also identifies asymptomatic infections) indicates that infection rates have levelled off (stopped falling) in the in the most recent week to 1.43%, after falling from the peak seen just before Christmas (see chart below).

Wales, estimated % testing positive or Covid-19 since 13 December



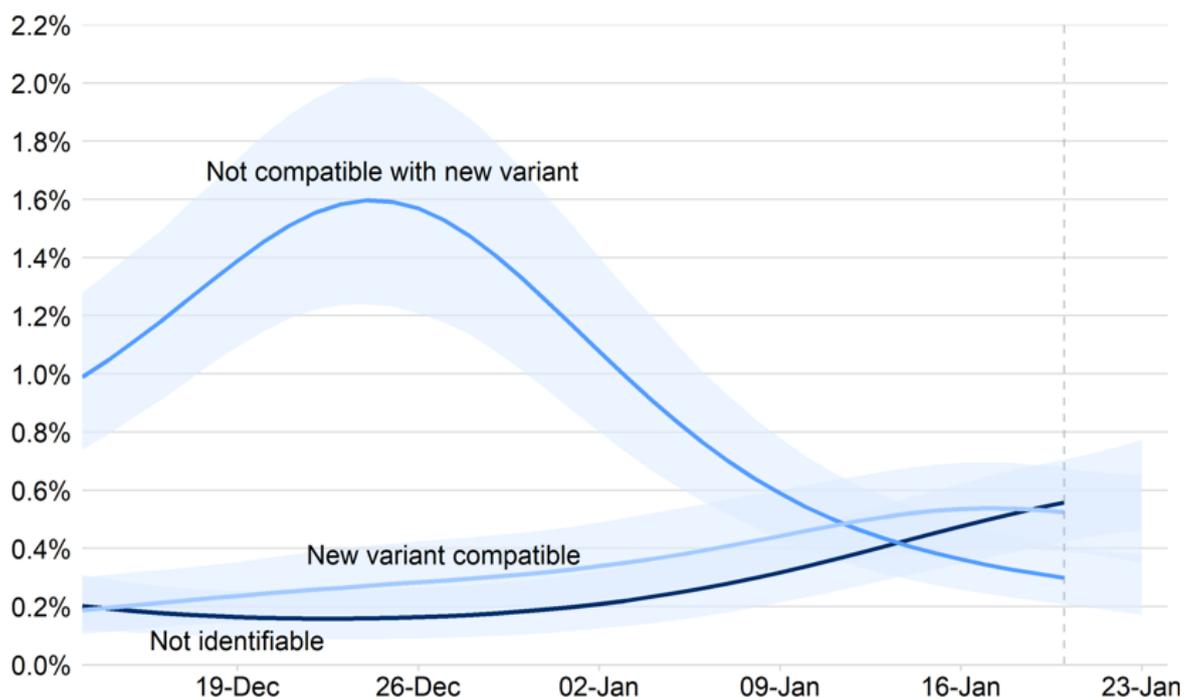
Source data: ONS Coronavirus Infection Survey, ONS, 29/01/21

⁵ [PHW Tableau](#) ; [PHW Local Authority report for week ending 28 January 2021](#) .

⁶ [ONS Coronavirus Infection Survey for Wales](#), 17 – 23 January 2021.

- Following a recent increase, positive cases that are compatible with the new variant VOC202012/01 have levelled off in the most recent week. Cases that are clearly not compatible with the new variant have decreased. The rate of cases where the virus was too low for the variant to be identifiable has increased in recent weeks. These are usually cases where individuals have had the virus for a longer period of time. See chart below.

Estimates of the percentages of positive cases compatible with the new UK variant and other positive cases since 13 December 2020



Source: Coronavirus (COVID-19) Infection Survey, ONS

The lines and shading represent the modelled trend and 95% credible intervals based on the latest data for cases compatible with the new variant, not compatible with the new variant and those where the virus is too low for the variant to be identifiable. Estimates for the last few days of the series, where no central estimate is shown, have more uncertainty.

- It is important to stress the uncertainty around these figures. Since the survey picks up relatively few positive tests overall, the results can be sensitive to small changes in the number of these positive tests. Further work is required to understand the difference between PHW case rates and ONS prevalence.
- *Hospital capacity* – The number of people with confirmed COVID-19 in hospital has decreased over recent weeks, but remains high and above the April peak. As at 2 February 2021, 1,138 beds were occupied with confirmed COVID-19 patients, a decrease from 1,370 on the same day in the previous week.

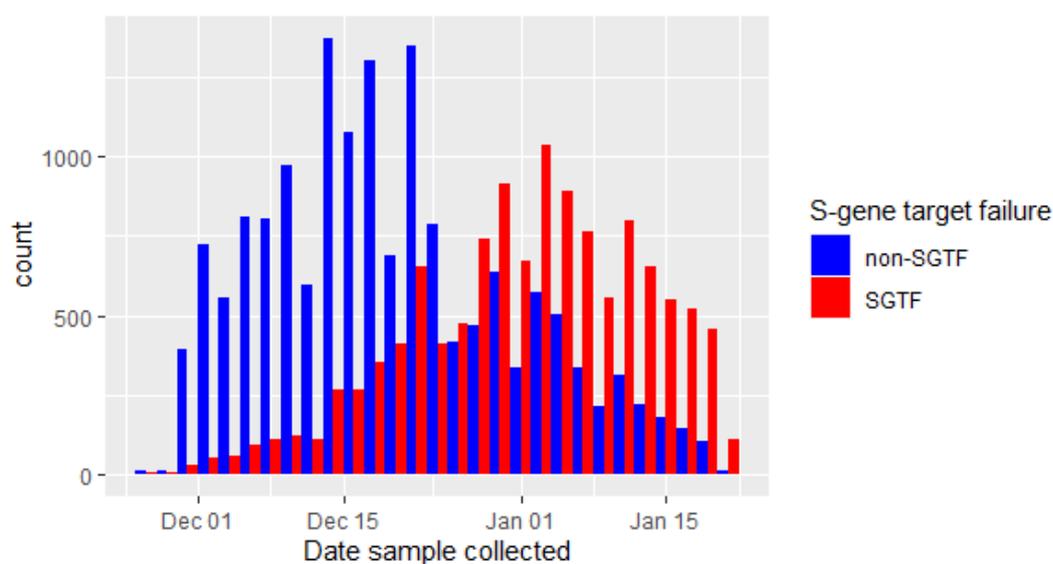
- *ICU capacity* – Overall ICU occupancy (COVID-19 and non-COVID-19 patients) has started to show a steady decline over the last 2-3 weeks but remains high. As at 2 February 2021, 113 invasive ventilated beds were occupied with COVID-19 related patients (confirmed, suspected and recovering). This compares to 130 on the same day in the previous week, and to 164 at the peak in April 2020.⁷

These indicators make clear that reductions in the incidence and prevalence of COVID-19 cases will need to be sustained to reduce the risk of exceeding NHS capacity in the coming months. In addition the UK remains at UK COVID-19 Alert Level 5 which indicates an ongoing material risk of healthcare services being overwhelmed, and any easements would be likely to increase that risk while the UK remains at that level.

Impact of the new variant VOC202012/01

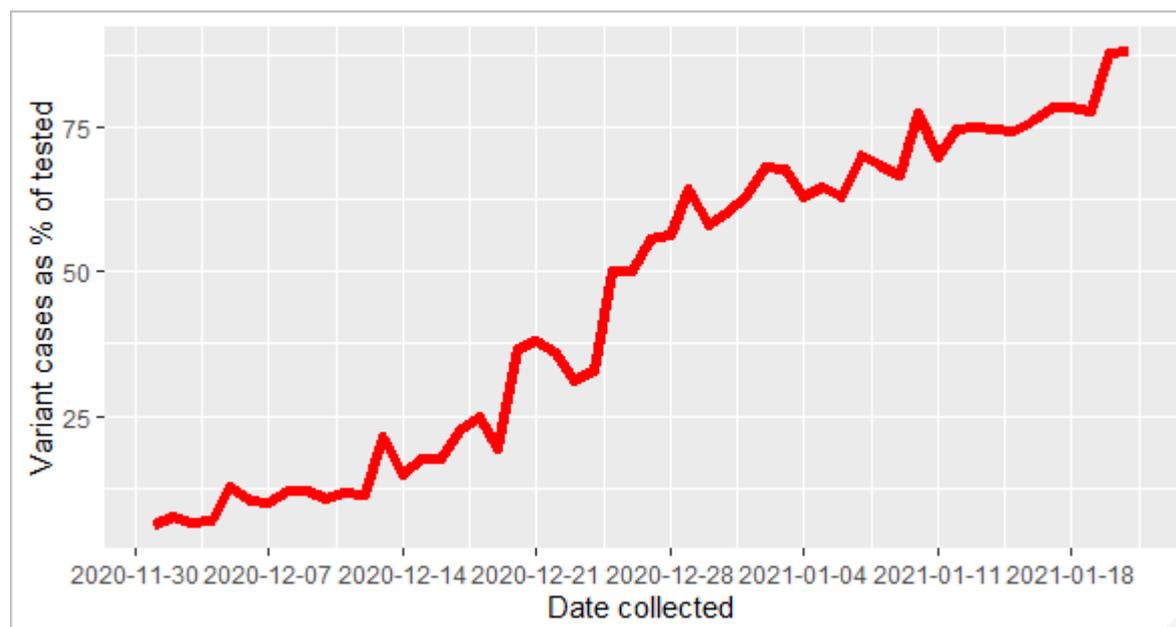
The risks are compounded by uncertainties around VOC202012/01.

VOC202012/01 has become more prevalent in Wales and is now the dominant variant. As explained in previous advice, S-gene target failure (SGTF) in some PCR test results can be used as a proxy for evidence of VOC202012/01. Up to 23/01/2021, 28,102 cases were tested using the assay that can detect SGTF, of which 12,131 had SGTF (43%). The numbers and proportion of SGTF cases has been increasing over time. Note that these will be biased away from hospitalised/pillar 1 tests, as they only come from Lighthouse Laboratory pillar 2 testing which is used for community and home testing samples.



Source data: Public Health Wales

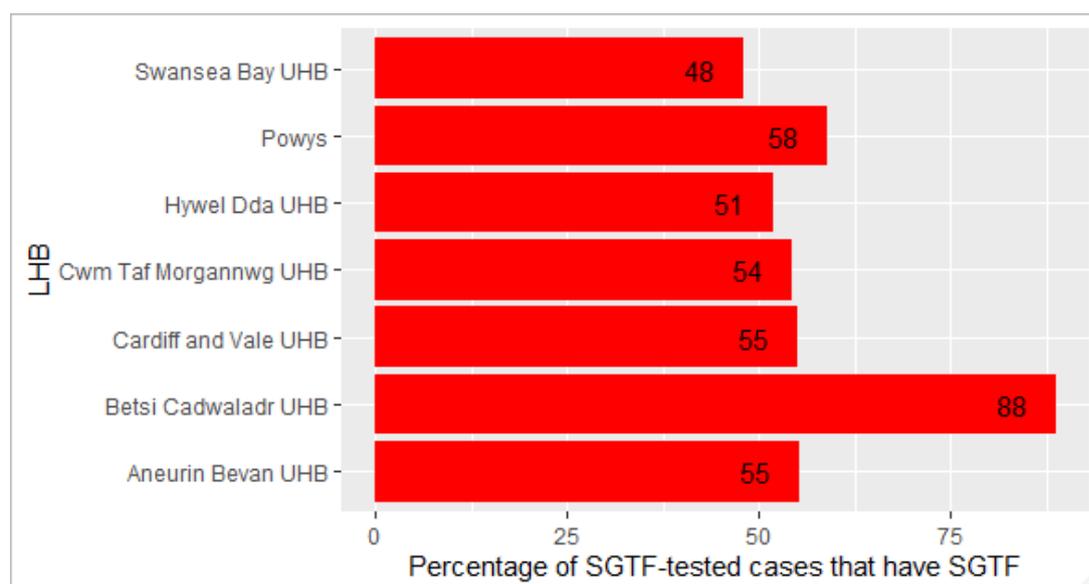
⁷ [NHS activity and capacity during the coronavirus \(COVID-19\) pandemic](#) , 4 February 2021.



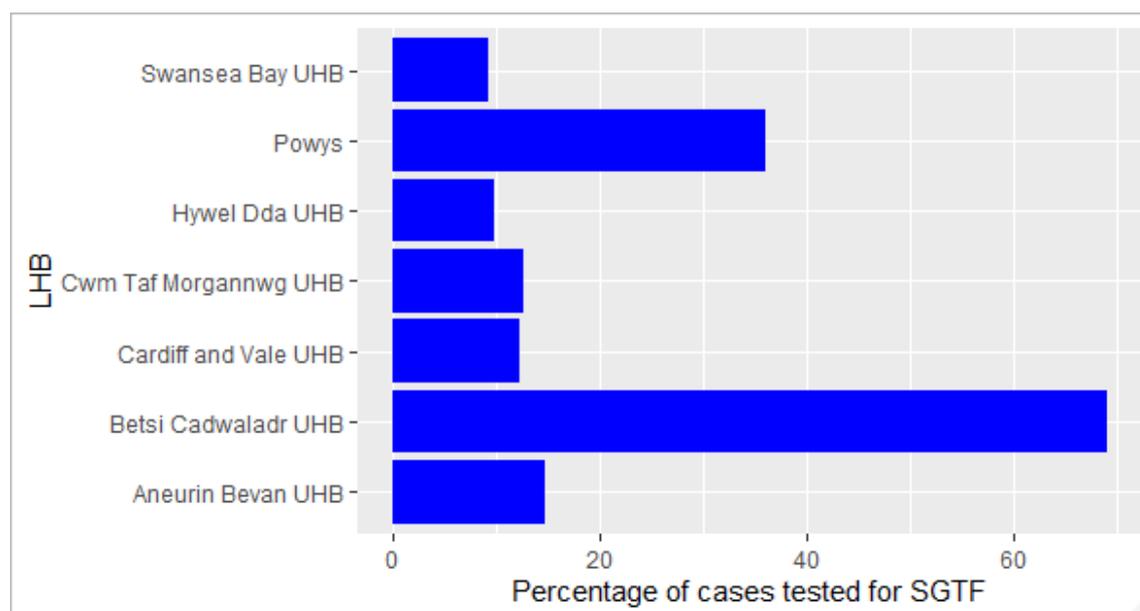
Source data: Public Health Wales

75% of those tested in the last 14 days were SGTF. The percentage with SGTF varied between health boards, from 48% (Swansea Bay UHB) to 88% (Betsi Cadwaladr UHB); it was at over 50% (51-58%) in all of the other health boards (Cardiff and Vale UHB, Aneurin Bevan UHB, Hywel Dda UHB, Cwm Taf Morgannwg UHB, Powys THB). Note that the representativeness of this testing varies by health board, from around 10% of cases being tested for SGTF in most health boards, to nearly 40% in Powys THB and nearly 70% in Betsi Cadwaladr UHB.

Percentage of LHL tested cases that are SGTF (proxy for variant VOC1) in last 14 days, by Health Board, of those tested for SGTF



Source data: Public Health Wales



Source data: Public Health Wales

There is evidence that VOC202012/01 is more transmissible than the “wild type” virus previously circulating. Early estimates of transmissibility included modelling by PHE that indicated the new variant might increase R_t by adding at least 0.5,⁸ as well as another estimate that this variant may be “56% more transmissible (95% credible interval across three regions 50-74%) than pre-existing variants of SARS-CoV-2”.⁹ However, the level of increase in transmissibility is not yet certain and so a variety of estimates have been considered by SAGE and SPI-M in modelling discussed below.

This is also reflected in the increased secondary attack rates for VOC202012/01 when compared with the “wild type” virus, as estimated by Public Health England (PHE):

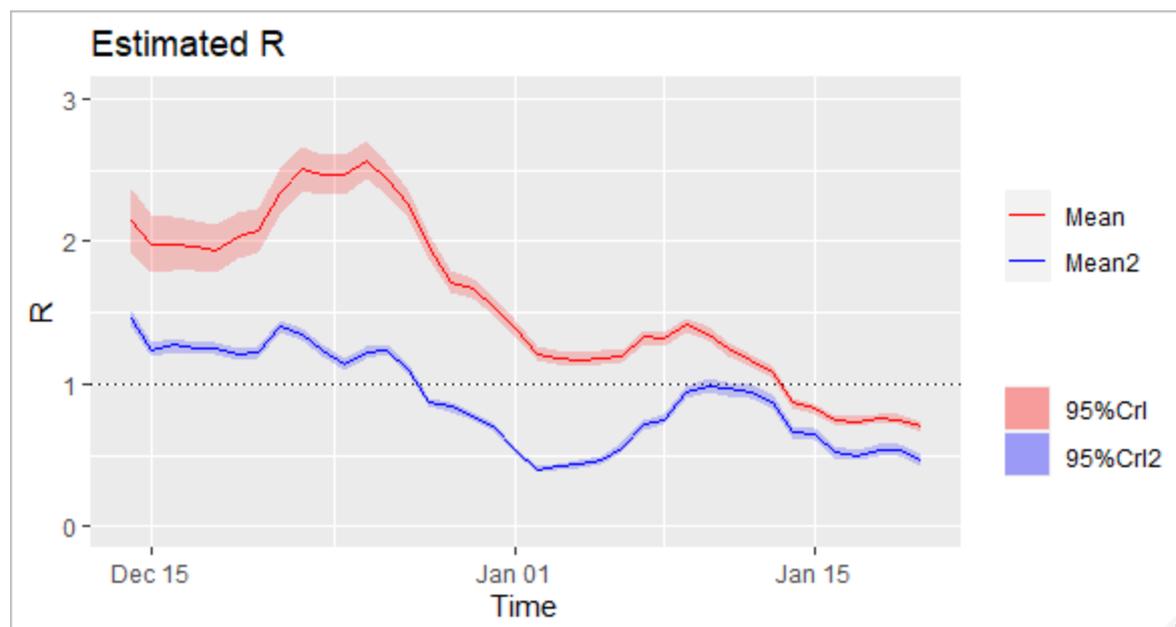
“Both when using genomic sequence data directly and SGTF as a proxy, the secondary attack rates estimated from contact tracing data are observed to be higher if the index case has the variant strain, from around 11% to 15% of named contacts. This increase is around 10% to 70% across most age groups and regions where sufficient sequencing data is available. Using the SGTF proxy to give a more comprehensive overview the increase is consistently around 30% to 50%.”¹⁰

⁸ Public Health England, [Investigation of novel SARS-COV-2 variant: Variant of Concern 202012/01, Technical Briefing 1](#), 21 December 2020, pages 3-4.

⁹ N. G. Davies, R. C. Barnard, C. I. Jarvis, A. J. Kucharski, J. Munday, C. A. Pearson, T. W. Russell, D. C. Tully and S. Abbott, “[Estimated transmissibility and severity of novel SARS-CoV-2 Variant of Concern 202012/01 in England](#),” *medRxiv [preprint]*, 26 December 2020.

¹⁰ Public Health England, [Investigation of novel SARS-COV-2 variant: Variant of Concern 202012/01, Technical Briefing 1](#), 21 December 2020, pages 3-4.

PHW have estimated R_t for VOC202012/01 and the “wild type” virus. The time-varying R has been estimated using the EpiEstim package, with a non-parametric serial distribution mean of 6.5 days and standard deviation 2 days, in line with the weekly PHW estimates methods. The figure below shows the outcome of that work for the period over recent weeks. The red line shows the R value for SGTF/variant cases, compared to the blue line for non-variant/non-SGTF cases. It shows that R is consistently higher for VOC202012/01 during this period, and only fell below 1 after around 10 January. The reductions in R over time are also more marked for the wild type virus than for the variant.



Source data: Public Health Wales

The greater difference in R_t between wild type and variant, when fewer restrictions were in place earlier in this time period may suggest that any loosening might produce an accelerated increase in cases of VOC202012/01, compared with the “wild type” variant.

NERVTAG and SAGE have also considered analysis of SGTF and non-SGTF cases identified through Pillar 2 testing, which have considered the levels of fatality which are associated with the new variant. There is a realistic possibility that infection with VOC202012/01 is associated with an increased risk of death compared to infection with non-VOC variants. The absolute risk of death per infection remains low.¹¹

¹¹ [NERVTAG paper on COVID-19 variant of concern B.1.1.7](#) .

Additional uncertainty due to other Variants of Concern

Other Variants of Concern have been identified in recent weeks which may bring additional uncertainty and risk – in particular the risk that these or other variants may reduce the effectiveness of a vaccination programme if there is a level of immune escape from any variants. In particular in relation to the variant of concern VOC202012/02, first identified in South Africa, there is evidence to suggest that this variant is associated with increased transmission. There is also evidence that this variant has increased resistance to convalescent plasma and to some monoclonal antibodies.¹² The clinical implications of this increased resistance remain unclear.

PHW have so far identified 13 cases of variant B.1.351 (10 confirmed and three probable) in Wales, out of the 90 so far identified in the UK.

2. How much headroom will be needed to further open schools?

The numbers of confirmed cases and small outbreaks associated with schools during the autumn rose as case rates rose in the wider community. Schools being open for face-to-face learning for most learners will have contributed to higher rates of transmission to an extent during this period. It remains difficult to quantify the level of transmission taking place specifically within schools as when schools are fully open for face-to-face learning more adults are attending work, there is more travel and commuting, and there are more ‘wrap around’ community and sport activities. However, schools do not appear to have disproportionately driven community transmission.¹³

Recent analysis by PHW of cases associated with schools across three local authorities also illustrates how levels of cases in schools did not vary significantly between most schools during the autumn, with a small number of exceptions. The variability of cumulative incidence in schools will increase in smaller schools. By plotting this school cumulative incidence against school size, schools with abnormally high or low incidences (in effect cases seen in relation to the size of the school) for the area can be identified. Over longer periods of time this reflects overall risk rather than individual incidents or clusters.

The figure below shows these “funnel plots” for 3 local authorities, chosen alphabetically. Outlying schools with high incidences can be seen in Bridgend (one school) and in Caerphilly, where 5 schools lie above the upper bound for incidence.

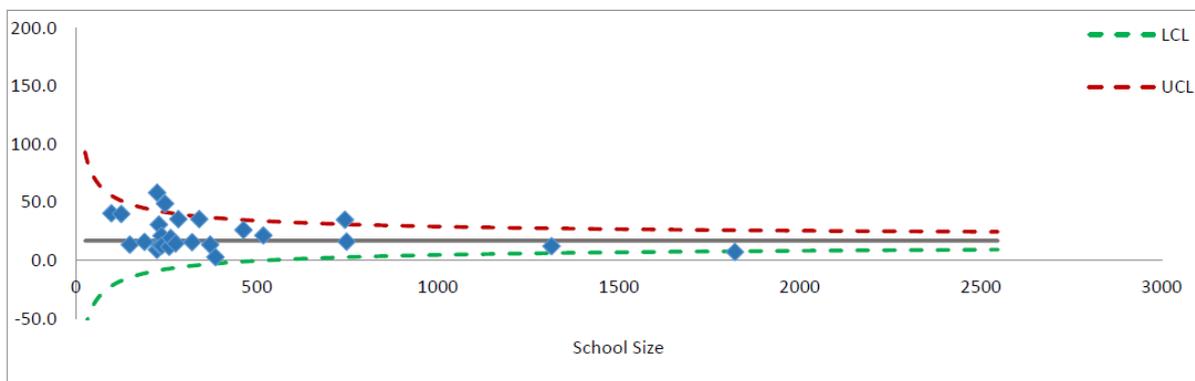
¹² NERVTAG, [SARS-CoV-2 immunity-escape variants](#), 7 January 2021 ; ECDC, [Risk Assessment: Risk related to spread of new SARS-CoV-2 variants of concern in the EU/EEA](#) ; ECDC, [Risk related to the spread of new SARS-CoV-2 variants of concern in the EU/EEA – first update](#)

¹³ [TFC: Children and transmission - update paper \(17 December 2020\)](#); [Technical Advisory Group: variant of concern and education in Wales, 7 January 2021](#)

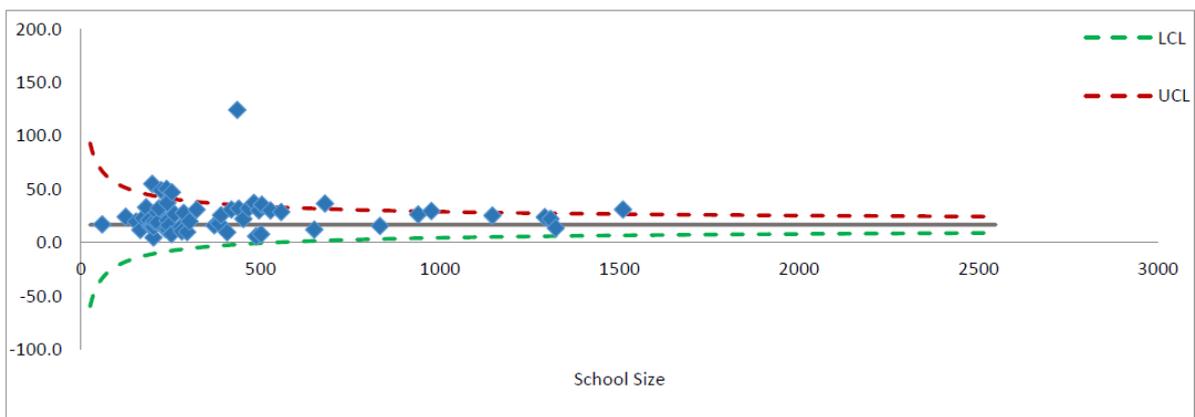
Repeating these plots over time when schools are open may help to identify local authorities where school transmission is higher than expected, and also individual schools which are outliers, to enable interventions.

Funnel plots of all school based case rates, including all staff linked to a school and pupils (cases/school size*1000) within schools by school size for each local authority (including ONLY those schools with cases), 1 September 2020 to 3 January 2021. Note: cases may be from multiple incidents. Currently school rate is relative and not absolute as calculated on known staff denominator thus missing 'other key school staff roles'. The lower confidence limit (LCL) is indicative as cases cannot go below zero.

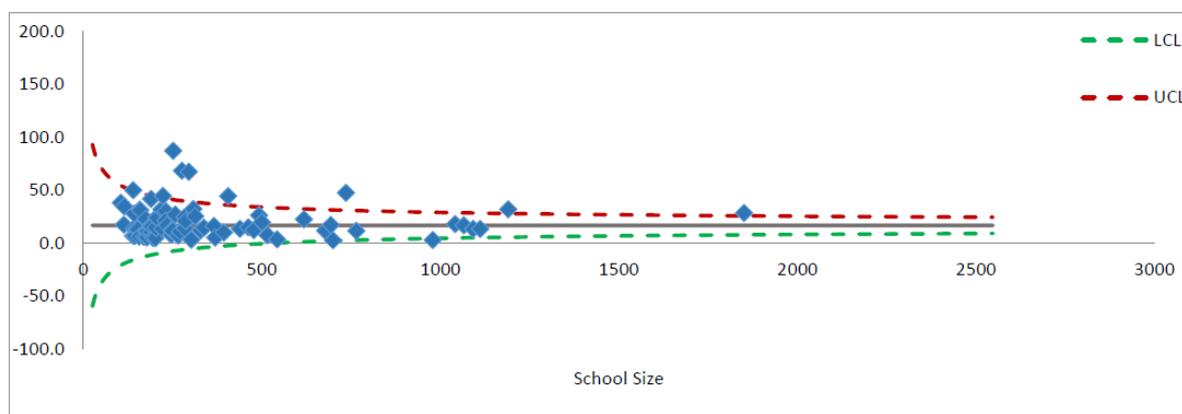
Blaenau Gwent



Bridgend



Caerphilly



Source data: Public Health Wales

VOC202012/01 becoming the dominant strain across Wales means that further measures beyond those applied during the autumn term may be required.

VOC202012/01 was capable of expanding in the South East of England and London despite lockdown measures sufficient to suppress other SARS-CoV-2 lineages,¹⁴ when school premises remained open for most learners during November. A higher ratio of the early cases of the variant in November and December 2020 were among 0-19 year olds than other age groups.¹⁵

Decreasing pressure on NHS services before more face-to-face teaching begins would give a greater margin of error if opening schools does create conditions for the new variant to grow exponentially.

Given the range of possible impacts for the vaccination programme, the health impacts of the vaccination programme should be monitored carefully. Lessening of NHS pressures should create more headroom if deaths and hospital admissions are key determinants of relaxation.

When considering the impacts of COVID-19 from releasing restrictions, it will also be important to consider the potential longer-term impacts of post-hospitalisation complications associated with COVID-19 as well as 'Long-Covid'. 'Long-COVID' is commonly used to describe signs and symptoms that continue or develop after acute COVID-19. It includes both 'ongoing symptomatic COVID-19' (from 4 to 12 weeks) and 'post-COVID-19 syndrome' (12 weeks or more). A study currently in preprint reported that "*Individuals discharged from hospital following COVID-19 face elevated*

¹⁴ [Virological, Lineage-specific growth of SARS-CoV-2 B.1.1.7 during the English national lockdown \(30 December 2020\)](#) ; Public Health England, [Investigation of novel SARS-COV-2 variant: Variant of Concern 202012/01, Technical Briefing 3](#), figure 4.

¹⁵ [Imperial, Transmission of SARS-CoV-2 Lineage B.1.1.7 in England: Insights from linking epidemiological and genetic data \(31 December 2020\)](#), page 7.

rates of multi-organ dysfunction compared with background levels, and the increase in risk is neither confined to the elderly nor uniform across ethnicities. The diagnosis, treatment and prevention of PCS [post-COVID syndrome] require integrated rather than organ- or disease-specific approaches. Urgent research is required to establish risk factors for PCS." Further TAG advice on 'long-COVID' has recently been published which explores the current evidence base in more detail.¹⁶

Key measures such as low levels of prevalence, an Rt number below 1, a lower test positivity rate, and lower levels of hospital occupancy and ICU occupancy would allow a return to more face-to-face learning in schools and potentially other easements. However the current level of uncertainty, particularly over the transmissibility of the new variant, means that a precise level for these measures which would allow such relaxations cannot be reliably identified at present.

More modelling has been commissioned from Swansea University to look at similar scenarios in Wales. This would look at broad options in the first instance.

3. What models of schools operating would strike a balance between the risks and benefits and what additional NPIs or mitigations would be helpful?

Previous school re-openings of premises in Wales to most learners have been on a phased or staggered basis, with check-ins following the first lockdown, and primary schools and years 7 and 8 returning during the second week of the firebreak. There could also be some benefits in mitigating the impact on transmission if schools open further on a partial basis only, if for example additional physical distancing arrangements or smaller contact groups could be maintained where possible.

School-age children

Confirmed case rates among children in Wales aged 11 or younger have consistently been relatively lower than those among older children, suggesting that in terms of transmission the return of primary school children to school premises might have less of an impact than the return of secondary school children.¹⁷

¹⁶ Daniel Ayoubkhani, Kamlesh Khunti, Vahé Nafilyan, Thomas Maddox, Ben Humberstone, Sir Ian Diamond, Amitava Banerjee, "[Epidemiology of post-COVID syndrome following hospitalisation with coronavirus: a retrospective cohort study](#)", *medRxiv [preprint]*, 15 January 2021 ; [Technical Advisory Group: Long-COVID, 3 February 2021](#) .

¹⁷ A recent rapid report from *Eurosurveillance* looking at cases in primary schools in areas of Norway between August and November 2020 found minimal evidence of in-school transmission from children of COVID-19 during this period. It should be noted that this was in the context initially of low community prevalence (with the rate of confirmed cases among children rising as overall rates rose), and that infection prevention and control measures in place in schools included physical distancing. See Lin T. Brandal et al., '[Minimal transmission of SARS-CoV-2 from paediatric COVID-19 cases in primary schools, Norway, August to November 2020](#)', *Eurosurveillance*, 7 January 2021.

Forthcoming research¹⁸ from Swansea University / SAIL which looked at confirmed COVID-19 cases among both staff and pupils attending schools in Wales in September to December 2020 found that, after adjusting for age, sex, rurality, school type, household case exposure, and numbers of staff/pupils in school/household, the numbers of cases in the preceding 14 days in the school were associated with a lower risk of testing positive. By contrast, a case in the household of a member of staff or pupil significantly raised their risk of testing positive. This was seen by the researchers as an indication of the effectiveness of mitigations in place in schools at this time, including policies on self-isolation where cases are identified.

In contrast, the number of cases in pupils within the same year group was statistically significantly associated with an increased likelihood of testing positive (which could be seen as a proxy for cases within contact groups in schools), suggesting that some pupil-to-pupil transmission did take place.

A recent review of intelligence on cases associated with schools in Cwm Taf Morgannwg¹⁹ highlighted a number of points including that:

- *Approximately half of cases can be accounted for by community acquisition, mostly from a household member index case.*
 - *Where cases are identified in a school setting they are usually associated with a smaller social/friendship groupings both inside and outside school*
 - *Remaining cases could not identify a clear source of transmission. There is no clear evidence of wider in-school transmission, outside of these smaller social/friendship groups social groups*
 - *Higher case rates in schools are associated with higher community transmission*
- [...]
- *Overall, cases and contact remained low, as a proportion of all pupils and staff, indicating effective control measures in place.*

Schools workforce

Transmission involving the schools workforce should also be considered. 43% of confirmed cases in Wales associated with a school between 1 September and 23 December were in staff.²⁰ PHW have undertaken an analysis of the cumulative incidence of cases in staff, stratified by school type,²¹ compared to the cumulative incidence in the whole population, stratified by age group, over the period from 1 September to 31 December 2020 (although 713 of 3,440 staff cases were excluded

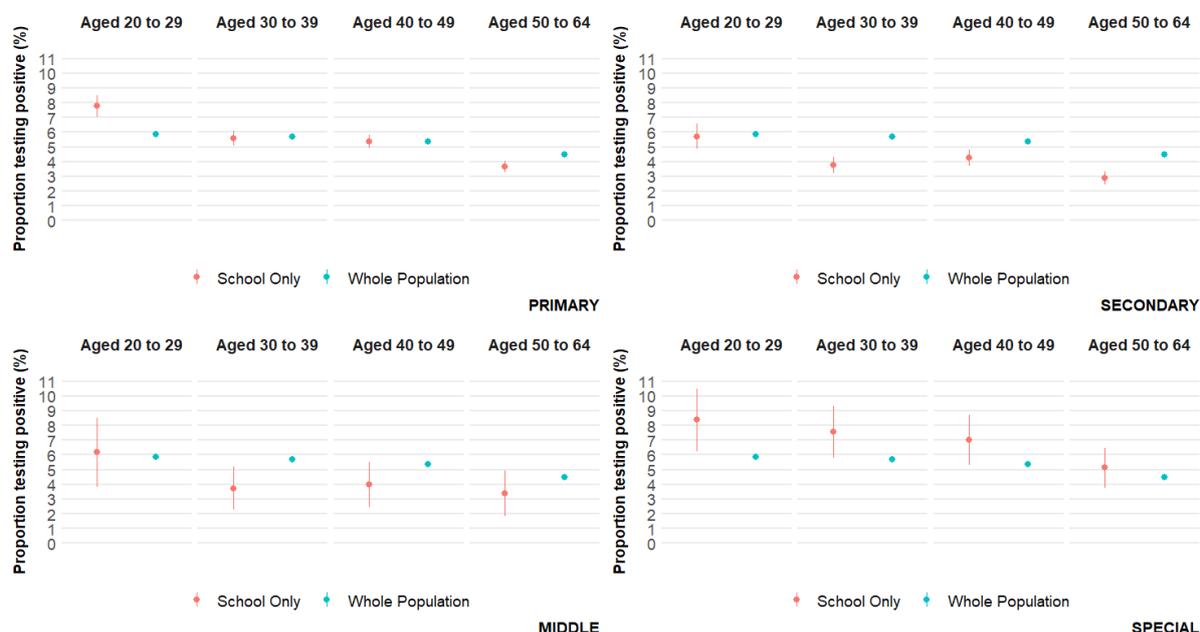
¹⁸ Staff-Pupil SARS-CoV-2 Infection Pathways in Schools: A Population Level Linked Data Approach, forthcoming as a preprint, February 2021.

¹⁹ [Review of transmission of Covid-19 associated with schools in Cwm Taf Morgannwg](#), 8 January 2021.

²⁰ [Technical Advisory Group: variant of concern and education in Wales, 7 January 2021](#)

²¹ Definitions of school types follow those in the Welsh Government's [Address list of schools in Wales](#).

from this analysis as the job role was considered not to be included in the denominator data – see further below):



Source data: Public Health Wales

For primary school educational staff aged 20 to 29, there is a slight increase in cumulative incidence with nearly 8% of these staff testing positive over the period, compared with around 6% in the same age group in the Welsh population. Apart from this, for primary, secondary and middle schools, the cumulative incidence in educational staff is the same or lower than that for the comparable Welsh population.

The cumulative incidence is higher in staff in the 20-49 age groups in special schools, than in the Welsh population.

Table 1 below shows a summary cumulative incidence for staff and pupils, compared to the Welsh population. The cumulative incidence is lower for staff in middle and secondary schools compared to the 20-65 age groups in the Welsh population, and higher for primary and special schools, and these differences are statistically significant. The overall attack rates within school pupils was lower than that in school staff. The attack rate in special schools was higher than in primary and secondary schools.

Table 1. Attack rate in educational school staff, pupils and Welsh population aged 20 to 65. Case numbers and denominators shown. Time period 01/09/20 to 31/12/20

	Middle School		Primary School		Secondary School		Special School		Wales
	STAFF	PUPIL	STAFF	PUPIL	STAFF	PUPIL	STAFF	PUPIL	Adults 20-65
Cases	91	226	1685	1967	709	1978	233	73	94692
Denom	2029	20272	27160	248250	17045	170590	3292	5138	1825127
Rate	4.48	1.11	6.20	0.79	4.16	1.16	7.08	1.42	5.19
Upper CI	5.39	1.26	6.50	0.83	4.46	1.21	7.95	1.74	5.22
Lower CI	3.58	0.97	5.92	0.76	3.86	1.11	6.20	1.10	5.16

Source data: Public Health Wales

Due to a lack of appropriate employment denominator data PHW are currently are unable to estimate attack rates in other important staff groups within school settings, thus catering staff, cleaners and caretakers are not included in these estimates. PHW will seek to address this important shortfall in intelligence.

In addition, as noted above, Swansea University / SAIL research into confirmed COVID-19 cases among staff of schools in Wales between September to December 2020 found that, after adjusting for other relevant factors, the numbers of cases in the preceding 14 days in the school were associated with a lower risk of staff testing positive.

The review of intelligence on cases associated with schools in Cwm Taf Morgannwg²² highlighted some specific points regarding cases associated with staff including that:

- *Staff car sharing without wearing suitable face masks [this review does not clearly differentiate between face coverings, face masks and other PPE] has been found to contribute to spread of infection.*
- *Staff such as lunch time supervisors, breakfast club supervisors and cleaners have been found to have several jobs; including across several different schools, and in some cases, as care staff in residential care homes. A number*

²² [Review of transmission of Covid-19 associated with schools in Cwm Taf Morgannwg](#), 8 January 2021.

of cases have been linked to agency teaching staff, who work across more than one school setting.

[...]

- *Breaches in control measures: donning of PPE and maintaining social distancing, are not adhered to in primary schools between staff and pupils as they are in secondary schools. This could be a contributory factor to the number of positive cases in staff that are noted in primary schools.*
- *Staff-to-staff transmission should also be considered as a possibility of the increased number of cases in staff in special and primary schools. In these settings, there is usually more than one member of staff per classroom due to the presence of teaching assistants and learning support officers*

An earlier TAG paper discussed evidence of COVID-19 infections among teachers and the education workforce from England and Scotland.²³ Since that paper additional ONS analysis of deaths in the working age population across England and Wales has been published.²⁴ This analysis suggests that the risk of death with COVID-19 for men and women working in teaching and educational locations is comparable to other professional occupations, and lower than rates of death with COVID-19 in the wider population.

ONS analysis indicates that rates of death involving COVID-19 registered between 9 March and 28 December among working age (20-64 years) men and women who worked as teaching and educational professionals (18.4/9.8 per 100,000 for males/females) were statistically significantly lower than the rates of death involving COVID-19 among those of the same age and sex in the wider population (31.4/16.8 per 100,000). Rates of death involving COVID-19 among all teaching and educational professionals were not statistically significantly different to rates in other 'professional occupations' as a whole (17.6/12.8 per 100,000 for males/females).

For specific teaching and education professions, it was only possible for ONS to calculate a reliable rate for secondary education professionals. Rates of death involving COVID-19 in all secondary teaching professionals (39.2/21.2 per 100,000 for males/females) were not statistically significantly different to those of the same age and sex in the wider population. The rate of death involving COVID-19 in male secondary education professionals was however statistically significantly higher than the rate of death involving COVID-19 for men of the same age in professional occupations. This suggests that men working in secondary education may have a higher risk of COVID-19 mortality than comparable men in other professional occupations.

²³ [Technical Advisory Group: variant of concern and education in Wales, 7 January 2021](#)

²⁴ ONS, [Coronavirus \(COVID-19\) related deaths by occupation, England and Wales: deaths registered between 9 March and 28 December 2020](#), released 25 January 2021.

This ONS analysis adjusted for age and sex, but not for other factors such as ethnic group, place of residence, deprivation, or the occupation of others who live in the same household. As such some caution is needed in interpreting findings as reported differences may not conclusively relate to differences in occupational exposure. Occupation data was taken from two sources: as reported on death certificates at the time of death registration and from the 2019 annual population survey (for population counts). There could be some misalignment between these: reported occupation at death may reflect main lifetime occupation which could differ from that at the time of death; and analysis could be impacted if there has been a rapid increase or decrease in the number of workers in specific occupation(s) since 2019.

In terms of additional monitoring of COVID-19 infections among staff, the use of Lateral Flow Devices to test asymptomatic staff on a regular basis, in some settings where social distancing may not always be possible, such as primary schools, could offer one means of assessing the effectiveness of the transmission prevention interventions in place in that setting. It could also have the benefit of identifying a proportion of asymptomatic or pre-symptomatic infected individuals who might otherwise remain undetected. Assuming the prompt self-isolation of these individuals this would help to mitigate transmission involving the schools workforce to some extent. The purpose of any testing approach and use case should be clearly defined, as should the mechanisms for the electronic capture, collation and reporting of the resulting data.

The wider impacts on mixing and transmission might also be lessened through a partial return if that leads to fewer adults increasing their contacts and mixing.

Infection prevention and control measures

In addition to existing TAC advice²⁵ which has informed Welsh Government guidance on infection prevention and control measures to be put in place in schools, there is a need for further consideration by TAG of the latest SAGE work on the relative importance of some infection prevention and control measures in indoor workplaces including ventilation and face coverings.²⁶ TAG has also recently advised

²⁵ [Technical Advisory Group: Advice on return to school](#), 7 July 2020 ; [Technical Advisory Group: evidence review on children and young people under 18 in preschool, school or college following the firebreak](#), 9 November 2020

²⁶ SAGE, [Application of physical distancing and fabric face coverings in mitigating the B117 variant SARS-CoV-2 virus in public, workplace and community](#), published on 29 January 2021.

on the potential for use of air cleaning devices.²⁷ Schools are a workplace and the same hierarchy of risk controls needs to be reviewed, as in other workplaces, in the light of a more transmissible variant.²⁸ PHW have made the following specific recommendations around key infection prevention and control measures in schools:

- *Within schools the key control measures need to be further strengthened. These include reduction in the numbers mixing in time and place; reducing the size of bubbles; social distancing; hand hygiene and use of face coverings as per current guidance.*
- *Out of school restrictions must continue to be applied rigorously, with a clear understanding that “school bubbles” only apply within the school setting and not outside.*
- *The importance of avoiding transmission between teachers, as well as between staff and pupils should be emphasised.*

The review of transmission of COVID-19 in cases associated with schools in Cwm Taf Morgannwg, undertaken by a consultant in the Cwm Taf Morgannwg Local Public Health Team, makes a very similar set of recommendations for improvements.²⁹

A phased and gradual reopening of schools for more face-to-face learning would allow the impact of these relaxations on transmission to be carefully monitored. Given the increased transmissibility of VOC202012/01, monitoring the impact of any change over a period which allows the impact of a defined change to be reviewed would provide the opportunity to detect an increase in R above 1 or other key indicators, and if necessary to re-impose restrictions.³⁰

Educational and well-being impacts

This paper focuses on the direct COVID impacts of the operation of schools. However, the educational and well-being benefits of any partial return or phased reopening should also be considered, and balanced carefully against the risks of

²⁷ SAGE, [Potential application of air cleaning devices and personal decontamination to manage transmission of COVID-19](#), 4 November 2020 ; [Technical Advisory Group: Air cleaning devices](#), 3 February 2021 .

²⁸ [Technical Advisory Group: variant of concern and education in Wales, 7 January 2021](#)

²⁹ [Review of transmission of Covid-19 associated with schools in Cwm Taf Morgannwg](#), 8 January 2021. Modelling of in-school transmission in a recent preprint, Ryan S. McGee et al., '[Model-driven mitigation measures for reopening schools during the COVID-19 pandemic](#)', *medRxiv [preprint]*, 26 January 2021, similarly reinforces the role of dividing students into cohorts as a measure for mitigating in-school transmission.

³⁰ Similar conclusions have been reached in recent advice provided to the Scottish Government: [Coronavirus \(COVID-19\) Advisory Sub-Group on Education and Children's Issues – advice on phased return to in-person learning in schools and early learning and childcare \(ELC\) settings](#) , 3 February 2021 .

viral spread. In doing so, impacts on younger year groups who may have less ability to undertake self-directed learning and who have shown lower confirmed infection case rates, and the impacts on older pupils who are studying for GCSEs and A-Levels where the outcomes of their studies will have significant implications for their life chances should be prioritised. The overall conclusions from SAGE in November 2020 remain a helpful summary of the broader evidence of the key educational and well-being impacts where children are unable to access face-to-face learning in schools:

- 1. School closures put educational outcomes at risk, especially for disadvantaged students (High Confidence). Existing inequalities (High Confidence) and attainment gaps (Low/Medium Confidence) are already being exacerbated. Opportunities for early identification of emerging learning problems are also missed during school closures (High Confidence).*
- 2. School closures cause impairment to the physical and mental health of children. Evidence suggests that the mental health of adolescents is particularly affected (High Confidence). Cognitive, social, and emotional developmental outcomes are also at risk (Medium Confidence) as is physical health (Low Confidence).*
- 3. School closures have a particularly adverse impact on vulnerable children due to reduced access to essential services (High Confidence). Other lockdown-related stressors for children and parents, such as economic uncertainty, are also likely to be exacerbated (Medium Confidence).*
- 4. Extended periods of remote learning can lead to poorer educational outcomes, although some sources suggest that in the short-term adverse outcomes may be limited (Low Confidence).*

TAC are working with education officials in Welsh Government to build a fuller understanding of the educational and well-being impacts on children in Wales.

Existing TAC advice has also considered the wider impacts on children's education and well-being that arise from periods of schools operating remotely, possible mitigations of some of these impacts where they are negative, and the limitations around some of these mitigations.³¹ However SAGE and the SAGE subgroup looking at children is currently undertaking work to look at this further with a paper due to come back to SAGE in February; this will also need to be considered alongside other emerging evidence.

³¹ [Technical Advisory Group: summary of evidence on costs and benefits and potential mitigations for measures to address COVID-19 in Wales](#) , 25 November 2020

Planning and communication

It will also be important to consider a longer planning horizon for changes to the operation of schools. The current high level of uncertainty means that there is a possibility that periods of face-to-face or blended learning may need to alternate for some time with periods of remote learning; approaching this on a planned basis is likely to produce better results than a reactive approach.

Considering a longer planning horizon will also require strengthening the approach to monitoring the impacts of how schools are operating both in terms of transmission but also in terms of wider health, education and well-being. Work on strengthening this monitoring has begun, involving the COVID Intelligence Cell, the TAG Socio-Economic Harms subgroup and the TAG Children and Schools subgroup.

As plans are put in place it will be important to recognise a degree of nervousness in the wider population around reopening schools among the public, as well a clear recognition that there are concerns around children's education and their well-being, according to the latest PHW COVID-19 public engagement survey.³² It should be noted that these are population figures, not restricted to parents. These are also self-reported data, with reasonably small sample. Nonetheless these findings indicate still there may be an important role for government to communicate clearly the reasons for further decisions on the operation of schools, with parents, teachers and young people in mind.

³² [PHW COVID-19 public engagement survey](#) for the period 18 to 24 January 2021, published on 29 January 2021, pages 8, 14.