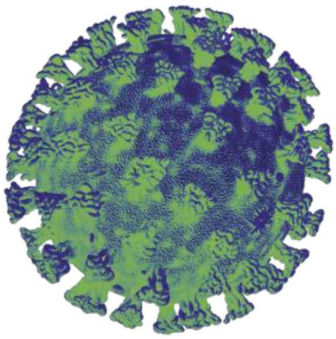
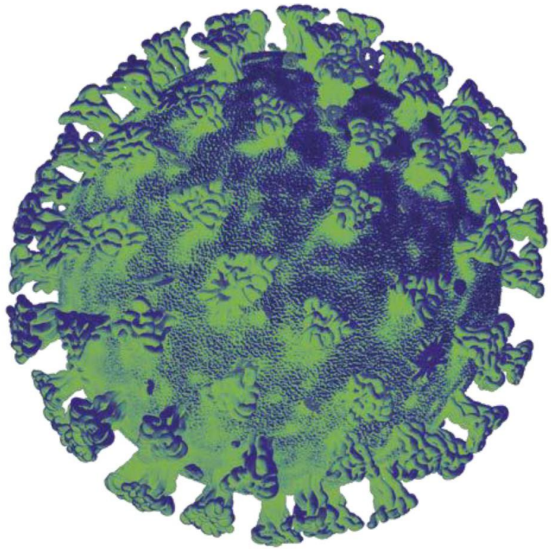
Llywodraeth Cymru
Welsh Government

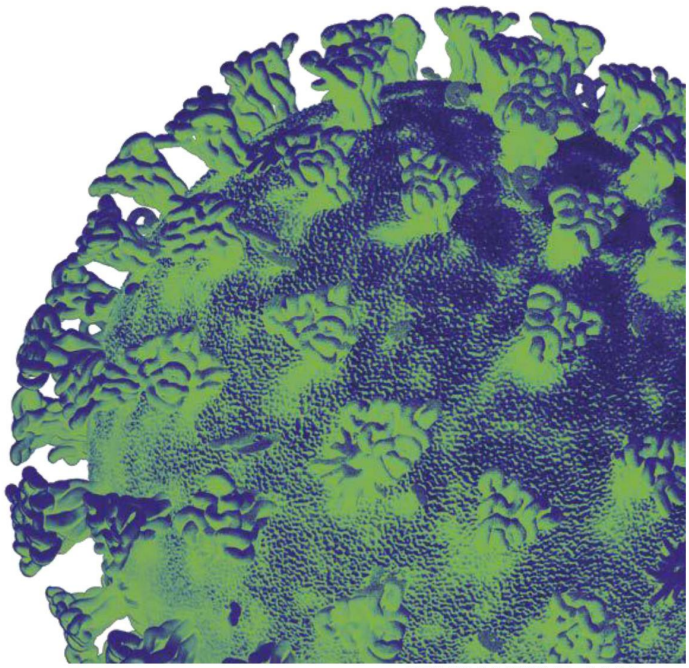
Technical Advisory Group

Variant of Concern (VOC 202012/01) and Education in Wales

07 January 2021







TAG Brief: Variant of Concern (VOC 202012/01) and Education in Wales (7 January 2021)

Key Messages

- The new Variant of Concern 202012/01 is more transmissible than the current "wild-type" SARS-CoV-2, and is likely to become the dominant variant in Wales across the whole population in a matter of weeks (high confidence).
- Reaching and maintaining Rt below 1 as this occurs will require a more widespread adoption and high levels of maintenance of risk-reducing behaviours and regulations in every sector and part of life (high confidence).
- Although the vaccination programme is ongoing, the risk-reducing behaviours and controls already communicated during the pandemic (Non Pharmaceutical Interventions, 'NPIs') remain the most effective means of reducing transmission, for everyone (high confidence).
- There is no evidence that the new variant increases the likelihood of worse health outcomes for individual children or adults (medium confidence). It is not yet clear whether the faster spread observed with this variant is consistent across age groups, or if there is a greater increase in transmission relative to other variants in some age groups. Direct Covid-related harm is as a result of higher infection rates across the whole population.
- It is unlikely, with the new variant becoming dominant and the current prevalence and test positivity rates for Covid-19 in Wales, that NPI measures currently in force in Wales, with primary or secondary schools open fully, would be sufficient to maintain R below 1. Rt would be lower with schools closed due to reduced social mixing (Moderate/high confidence).
- Further modelling work is required to understand the direct impacts of the new variant on health outcomes, to inform options to minimise the direct and indirect health harms and wider social and economic harms for children and the wider population, in the operation of childcare, schools and education, vaccine deployment and alert levels.

Variant of Concern (VOC 202012/01) in Wales

Recent data from London, East and South East England shows that once the Variant of Concern (202012/01, herein VOC) reached 25% of cases, it grew to 98% of cases in three weeks.[1] The higher rate of transmission of the variant leads to more cases,

[1] PHE, Investigation of novel SARS-CoV-2 variant: Variant of Concern (1 December 2020) Table 1

even with lockdown restrictions, and a resulting significant increase in hospital activity over a short period (high confidence).

VOC 202012/01 has been estimated to have a transmission advantage relative to non-VOC lineages in two ways: as an additive increase in Rt that ranged between 0.4 and 0.7, and alternatively as a multiplicative increase in Rt that ranged between a 50% and 75% advantage.[2] Additional preliminary evidence suggests that the variant spreads faster than its predecessors, continued to grow during the lockdown in England in which other lineages shrank and demonstrates a consistently higher R value by a factor of 1.47 at any given time.[3] Preliminary results from Public Health England's cohort study[4] suggests there is no statistically significant difference in hospitalisation and 28-day case fatality between cases with the variant and wild-type comparator cases. There was also no significant difference in the likelihood of reinfection between variant cases and the comparator group.

It is not yet clear whether the faster spread observed with this variant is consistent across age groups, or if there is a greater increase in transmission relative to other variants in some age groups. (SAGE 74, 22 December)

Cases of the VOC continue to increase in Wales at a significant rate, although the data are noisy due to Christmas and non-uniform testing for the variant across regions. Cases are also not uniformly tested for S-gene target failure (VOC proxy test) in Wales. This introduces more uncertainty for some areas, particularly in South Wales, where a smaller percentage of samples are tested for S-gene target failure due to differences in the testing kits used by Lighthouse laboratories.

It is likely, from the genome sequence and S-gene target failure data, that the VOC is not wholly responsible for the rapid increase in cases in Wales before the Christmas holiday period. Understanding adherence to the COVID-19 restrictions is not straightforward, with potential for misunderstanding[5], but it would appear some behaviours in public and in private have not reflected a generally shared concept of the risks associated with transmission of Covid-19 at a population level. Regardless of the starting point, the increase in prevalence of the VOC is likely to lead to a marked increase in the SARS-CoV-2 growth rate and R observed in Wales.

Figure 1 shows the increase in S gene dropout (proxy for variant) over time, and its increase relative to the previous virus types.

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[2] Imperial, Transmission of SARS-CoV-2 Lineage B.1.1.7 in England: Insights from linking epidemiological and genetic data (31 December 2020)
[3] Virological, Lineage-specific growth of SARS-CoV-2 B.1.1.7 during the English national lockdown (30 December 2020)
[4] PHE, Investigation of novel SARS-CoV-2 variant (1 December 2020)
[5] See for example Michie S., West R., Harvey N. The concept of tackling "fatigue" in covid-19. BMJ (2 November 2020) and Reicher S., Drury J. Pandemic fatigue? How adherence to covid-19 regulations has been misrepresented and why it matters. BMJ (7 January 2021).

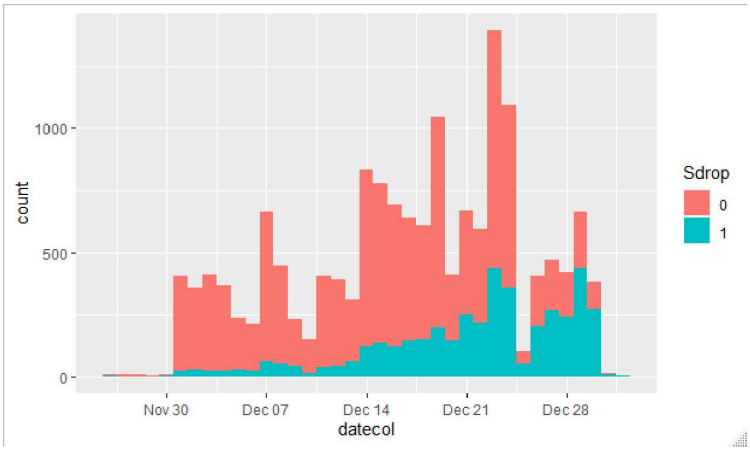

Figure 1. All S gene tested in Wales, by date collected and S gene dropouts (variant – 1, represented in light blue, non-variant 0, represented in orange) data from 2 January (PHW)

In Betsi Cadwaladr University Health Board (BCU), 50% of cases have been tested for the S-gene drop-out, and latest figures suggest that of those 64% are likely the VOC. This represents a 90% increase of the VOC in one week (Figure 2). The relatively large number of BCU Pillar 2 samples that have been tested for the S-gene target failure would suggest that North Wales has significant numbers of the variant and that this is likely to grow to dominate new cases (90%+) within the next 1-2 weeks (moderate-high confidence).

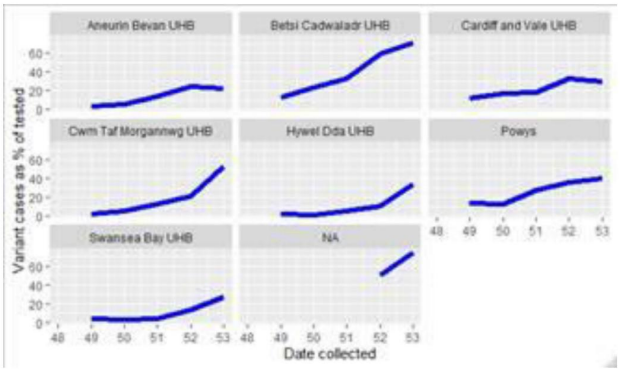

Figure 2. VOC cases as a percentage of positive tests for SGTF, by Health Board (2 January 2021) (PHW)

In Figure 2, apparent recent decreases of the VOC in some areas of South Wales are probably artefactual and potentially misleading due to measurement delay related to the holiday period.

It is highly likely that some areas of North Wales (such as Wrexham and Flintshire) have higher levels of the VOC than other areas (high confidence).

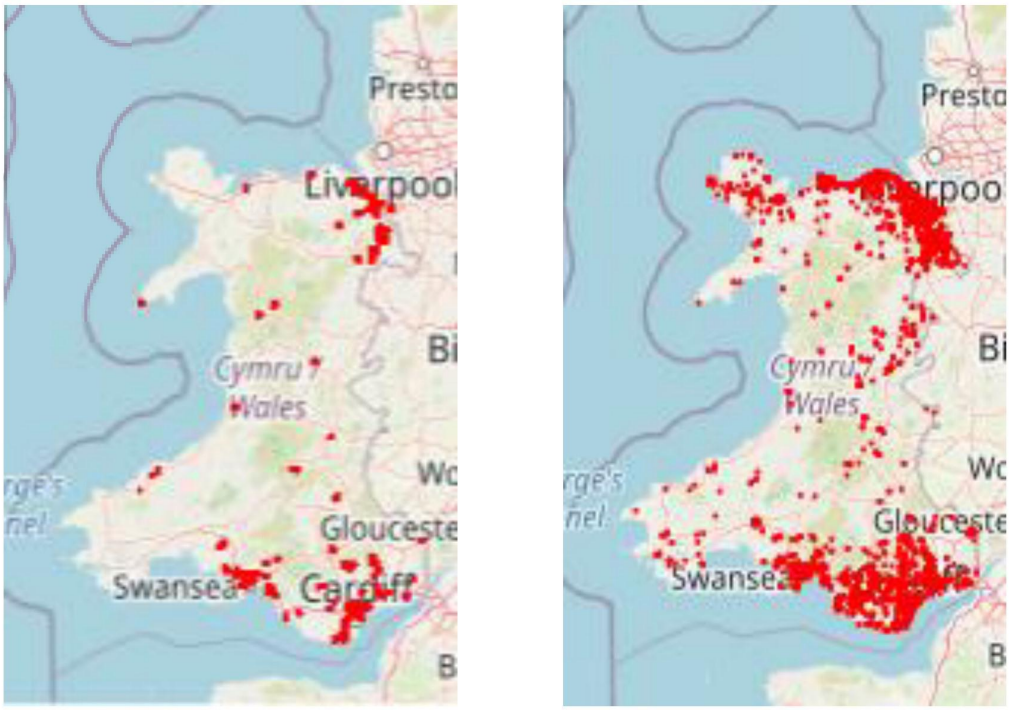

Figure 3. Geographic distribution of all cases of VOC identified in Wales before 7 December 2020 (left map) and all cases of VOC identified in Wales to 6 January 2021 (right map)

Most recent data suggests increasing prevalence of VOC in South Wales, with the incidence now at 25% (an increase of 50% in one week, although this is based on only a subset of positive cases). Cardiff and Vale University Health Board (CVUHB) were 21% up to 26 December, rising to 32% as of 2 January (moderate-high confidence). A more representative sample set from South Wales needs to be analysed to provide greater confidence, but if the new variant grows in Wales as it has in London, East and South East England, it will bring a period of significant further increased pressure on the NHS (high confidence).

At population level, recent survey data suggest that while the majority of people continue to stick to the restrictions in place, there is some evidence of non-adherence, including household mixing and non-essential travel[6]. Further data will be available in the coming weeks. Crucially, advice on tackling transmission of the new variant remains as set out in the recent TAG update, with an emphasis on staying at home, social distancing when out, avoiding social mixing, hand washing, use of face coverings, ventilating homes, seeking a test if symptomatic and self-isolating when required to do so[7]. Furthermore, SAGE recommend encouraging adherence to such interventions through a combination of recognising population efforts to date, providing a clear rationale for actions thought necessary, creating

[6] Technical Advisory Group, Policy Modelling: December 2020 and January 2021 (18 December 2020)
[7] Technical Advisory Group, Brief on the viral variant VOC-2020/12/01 (24 December 2020)

acceptable solutions where risk is hard to avoid, provision of support and culturally appropriate communications[8]. Again, this is consistent with advice provided throughout the pandemic to date.

Education and schools

Accumulating evidence is consistent with increased transmission of SARS-CoV-2 (current strain, wild-type) occurring amongst school children when schools are open, particularly in children of secondary school age (high confidence): multiple data sources show a reduction in transmission in children following schools closing for half term, and transmission rates increasing again following the post-half term return to school (medium confidence). It is difficult to quantify the size of this effect, and it remains difficult to quantify the level of transmission taking place specifically within schools compared to other settings, open schools also being associated with adults attending work, more travel and commuting, and schools day wrap around, community and sport activities[9] in the end-to-end day. (SAGE Children Sub-Group)

ONS analysis published on 14 December contrasted contacts for school age children and adults in England gathered through the COVID-19 Community Infection Survey (CIS). According to this analysis children's contacts increased during the term (except over half term) while by contrast, across "*all ages of socially distanced contacts, in adults the number of socially distanced contacts has decreased over time from late September or early October, which could be because of tighter local and national restrictions*."[10] Similarly the CoMix report for survey week 38, looking at data up to 15 December 2020, reported that under 18 year olds "*have much higher and variable contacts overall* [when compared with the general population] *driven by educational contacts*".[11]

The virus spreads when an infected individual comes into contact with one or more uninfected individuals, via direct contact (person to person or droplet transmission), or indirect contact (aerosol or fomite spread).[12] The relatively higher numbers of contacts which children appear to have had, on average, during the autumn, when compared with adults, is therefore likely to have been a factor in contributing to the rising rates of infection in England among school age children, particularly secondary school age children, during the autumn.[13]

In Wales, according to PHW data, rates of confirmed cases among school age children have also risen during the autumn and winter, although these have usually been, and currently remain, lower than among most other age groups, and

[8] EMG/SPI-B/TWEG: Mitigations to reduce transmission of the new variant SARS-CoV-2 virus (22 December 2020)
[9] TFC: Children and transmission - update paper (17 December 2020)
[10] Coronavirus (COVID-19) Infection Survey: characteristics of people testing positive for COVID-19 in England and antibody data for the UK: December 2020 (14 December 2020)
[11] CoMix social contact survey, week 38, data to 15 December 2020
[12] Technical Advisory Group: statement regarding non-pharmaceutical interventions in the pre-Christmas period (7 December 2020)
[13] These rising rates of infection in England are illustrated in the SAGE paper cited at note 9 above using ONS CIS data.

consistently lowest in pre school and junior schools age groups – see Figures 4 and 5 below. (Changes in testing patterns over the Christmas period make the data for the last two weeks of the PHW data more difficult to interpret, in addition to the caution that should be taken with interpreting more recent data.)

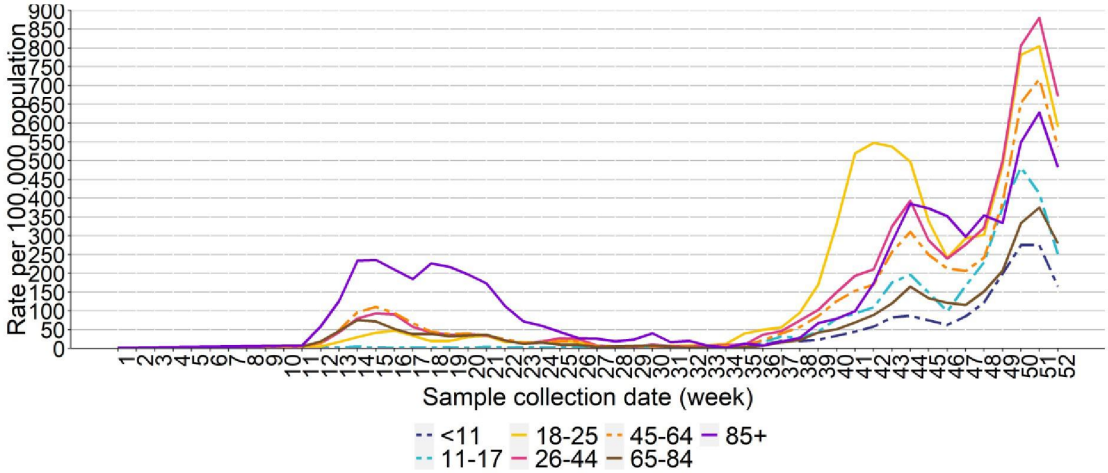

Figure 4. Confirmed COVID-19 episodes per 100,000 population, by week of sample collection and age group, Wales (Public Health Wales Datastore 9am 04/01/2020)

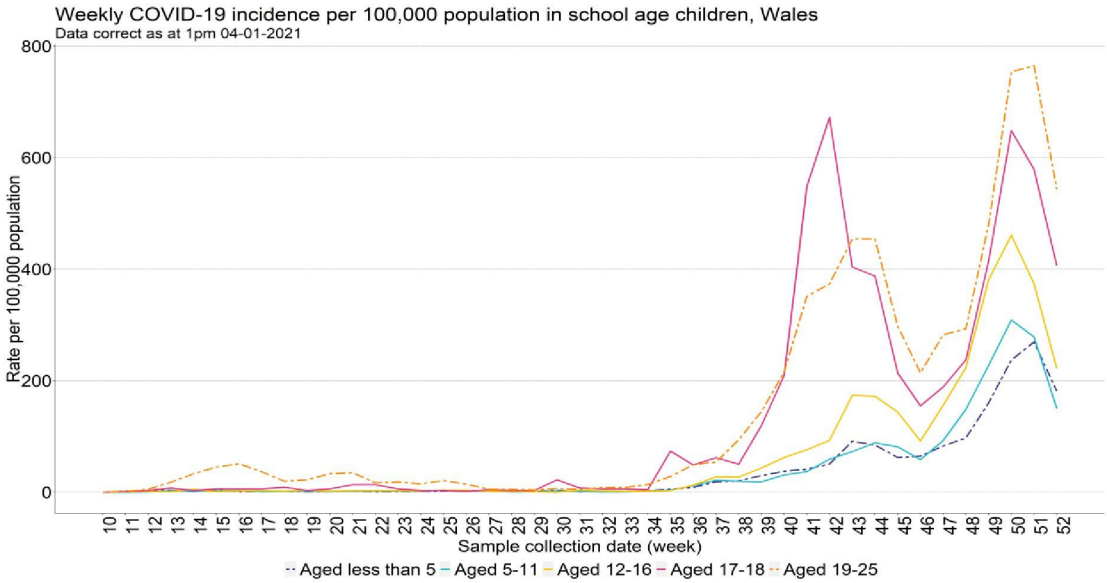

Figure 5. Confirmed COVID-19 episodes per 100,000 population, by week of sample collection and school age groups, Wales (Public Health Wales Datastore 9am 04/01/2020)

The ONS CIS reports on characteristics of those testing positive for COVID-19 note that around a third of those who test positive report any symptoms at the time of their test[14]. Participants report any symptoms through the survey and these rates are

[14] *This statement was updated on 28 January 2021 after an error was identified. The original text incorrectly stated 'The ONS CIS reports on characteristics of those testing positive for COVID-19 note that around a third are diagnosed whilst asymptomatic'.*

broadly consistent across age groups, although this will of course include pre-symptomatic and post-symptomatic cases as well as asymptomatic cases.[15] There is some uncertainty about rates of asymptomatic infection as research conducted earlier in the course of the pandemic suggested there could be a greater proportion of asymptomatic cases among children compared with adults.[16] Early results from the ONS School Infection Study (SIS) conducted in England and published on 17 December indicated similar low levels of infection in staff and pupils attending school (and so without clear symptoms, as symptomatic individuals should not have been attending school). Among those tested, 1.24% of pupils and 1.29% of staff tested positive for current infection.[17] It should be noted the estimated participant enrolment rate for round one of SIS testing is 17% for pupils and 55% for staff which gives low confidence in generalisability of these findings. New methods of participant engagement are being put into place to increase numbers of participants for subsequent rounds of testing. It should also be noted the study design (which over-samples schools in areas of England where COVID-19 infection was highest at the start of the academic year) means the data presented are not intended to be generally applicable to all schools in England.

The pattern of confirmed cases and clusters of cases associated with schools in Wales reported by PHW during the autumn term did not indicate a large proportion of transmission associated with schools. Between 1 September 2020 and 23 December 2020, there were 7,304 reports of new COVID-19 cases associated with 1,127 schools; 3,176 cases (43%) in staff and 4,128 (57%) in pupils. From a total of 1,573 schools across Wales, this represents 71.6% of schools that have had a COVID-19 case during the autumn term 2020. Of these, 245 schools (16% of schools) were associated with only one case. In the last 21 days to 23 December 2020, of the 1,573 schools across Wales, 760 schools (48%) were not associated with any cases, 262 (17%) with one case, 166 (11%) with two cases, 107 (7%) with three cases, 196 (12%) with between four and eight cases, 71 (5%) with between nine and nineteen cases, and 11 (less than 1%) with twenty or more cases (Figure 6).[18]

[15] Coronavirus (COVID-19) Infection Survey: characteristics of people testing positive for COVID-19 in England and antibody data for the UK: November 2020 – see figure 6.
[16] For example S. Beale, A. Hayward, L. Shallcross, R. W. Aldridge and E. Fragaszy, "A Rapid Review of the Asymptomatic Proportion of PCR-Confirmed SARS-CoV-2 Infections in Community Settings," 2020, https://www.gov.uk/government/publications/nervtag-rapid-review-of-the-asymptomatic-proportion-of-pcr-confirmed-sars-cov-2-infections-in-community-settings-9-september-2020 (a review of the literature to 25 August 2020); R. Viner, J. Ward, L. Hudson, M. Ashe, S. Patel, D. Hargreaves and E. Whittaker, "Systematic review of reviews of symptoms and signs of COVID-19 in children and adolescents," online at https://adc.bmj.com/content/early/2020/12/16/archdischild-2020-320972 (a review of the literature to 25 October 2020); N. G. Davies, P. Klepac, Y. Liu, K. Prem, M. Jit, CMMID COVID-19 working group and R. M. Eggo, "Age-dependent effects in the transmission and control of COVID-19 epidemics," *Nature Medicine,* vol. 26, pp. 1205-1211, published 16 June 2020, online at https://pubmed.ncbi.nlm.nih.gov/32546824/ ; Buitrago-Garcia D, Egly-Gani D, Counotte MJ, Hossmann S, Imeri H, Ipekci AM, et al. Occurrence and transmission potential of asymptomatic and presymptomatic SARS-CoV-2 infections: A living systematic review and meta-analysis. PLOS Medicine. 2020; Sept 17(9) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7508369/pdf/pmed.1003346.pdf (a review of the literature up to 10 June 2020)
[17] COVID-19 Schools Infection Survey Round 1, England: November 2020 (17 December 2020)
[18] PHW Schools and Colleges COVID-19 summary report (23 December 2020)

- Excluding 262 schools that have had only 1 case.

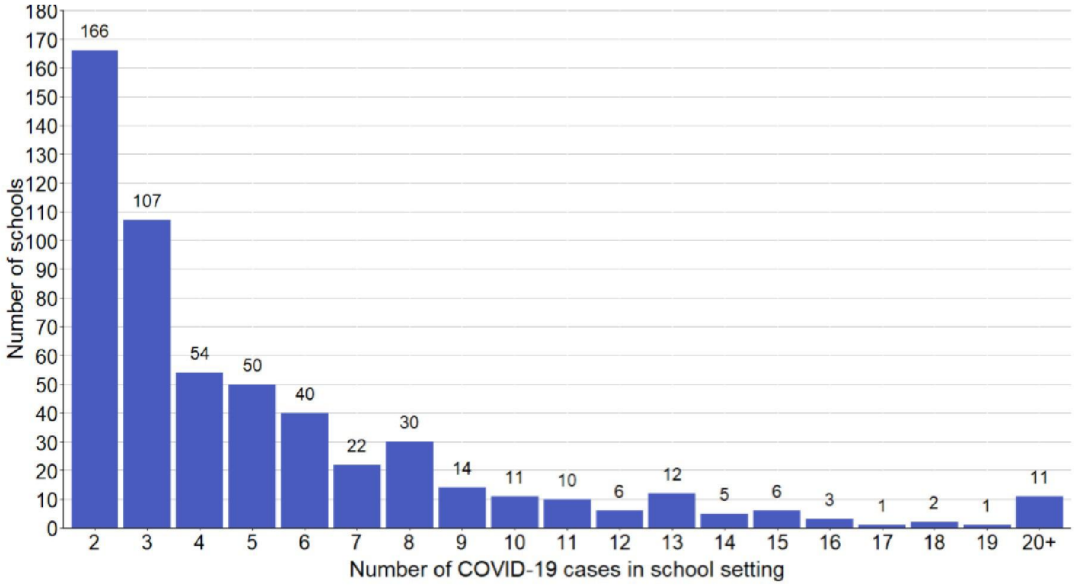

Figure 6. Number of schools with more than one Covid-19 case identified in the past 21 days (PHW).

ONS CIS data from 2 September to 16 October show no evidence of difference in the rates of teachers/education workers in England testing positive for SARS-CoV-2 compared to key workers and other professions (medium confidence). This is seen even when combining different categories of school staff in the analysis. Surveillance evidence from Scotland published on 16 December indicated that teachers in Scotland are not at increased risk of being hospitalised for COVID-19 compared to the population as a whole, and have a lower risk of having severe COVID-19 compared to the population as a whole, but that following the re-opening of schools in Scotland, the risk of testing positive has been higher among teachers than the general population. However, rates of testing in Scotland were relatively high among teachers after schools returned, so some of the increased risk of testing positive may be due to this. Nonetheless, teaching is an occupation which involves in-person working in settings with large numbers of other people. As such, some of the increased risk of testing positive may reflect this exposure. Equally, this analysis did not compare the risk of teachers to other, non-healthcare, in-person occupations, such as police, social care or retail. People working in educational settings in Scotland have similar levels of antibodies to the COVID-19 virus in their blood compared to the adult population as a whole.[19] This issue of risk of infection in school staff will need to be kept under review.

Despite all this, the emergence of the new variant means that further measures beyond those applied during the autumn term may be required. The VOC was capable of expanding in the South East of England and London despite lockdown measures sufficient to suppress other SARS-CoV-2 lineages.[20] It is highly unlikely

[19] Public Health Scotland, Enhanced surveillance of COVID-19 in education settings (16 December 2020)
[20] Virological, Lineage-specific growth of SARS-CoV-2 B.1.1.7 during the English national lockdown (30 December 2020)

that measures with stringency and adherence in line with the measures in England in November (i.e. with schools open) would be sufficient to maintain R below 1 if the new variant dominates. R would be lower with schools closed, with closure of secondary schools likely to have a greater effect than closure of primary schools. It remains difficult to distinguish where transmission between children takes place, and it is important to consider contacts made outside of schools. A SAGE paper from 22 December[21] notes school "opening" practically involves a wider set of changes to behaviour than those under the direct control of schools, and which are amenable to school-based mitigations.

In September SAGE advised regarding the wild type variant: "*Closing all schools associated with a reduction in R of 0.2-~0.5. Moderate confidence. Closure of secondary schools may be more effective (reduction in R of ~0.35) as link more households, higher numbers of contacts within schools and transmission to/from younger children may be more limited. Overall, low confidence, as unclear how much schools may contribute to community transmission.*"[22] More recent evidence similarly suggests there is a 16-54% (38% central estimate) reduction of Rt for the wild-type variant for closing schools and universities in conjunction[23].

It is not known whether measures with similar stringency and adherence as spring, with both primary and secondary schools closed, would be sufficient to bring R below 1 in the presence of the new variant.[24] (SAGE 74, 22 December). Further modelling using the Swansea University COVID-19 model is required is evaluate the potential health impacts of the new VOC over time. In doing so it will be important to estimate the impacts of schools closures alongside potential case rates to help estimate when action levels could be relaxed.

There continues to be strong evidence that children and younger people (<18 years) are much less susceptible to severe clinical disease than older people (high confidence). There is clear evidence of the negative educational impact of missing school, particularly for younger children, as investments in children's learning tend to accumulate and consolidate over time (high confidence).[25] Avoiding educational harm should remain a priority.

Preliminary SIS data shows varied implementation of different mitigations in schools. Further analysis of the link between different practices and infection levels needs to be undertaken. The 'Hierarchy of Risk Control'[26,27] is an important concept and

[21] SAGE, Seventy-fourth SAGE meeting on COVID-19 (22nd December 2020)
[22] SAGE, Non-pharmaceutical interventions (NPIs) table (21 September 2020)
[23] Science, Inferring the effectiveness of government interventions against COVID-19 (15 December 2020)
[24] SAGE, Seventy-fourth SAGE meeting on COVID-19 (22nd December 2020)
[25] SAGE, Children's Task and Finish Group: update to 4th Nov 2020 paper on children, schools and transmission (17 December 2020)
SAGE, SPI-B/DfE: COVID-19: Benefits of remaining in education - evidence and considerations (4 November 2020)
SAGE, Benefits of remaining in education: Evidence and considerations SPI-B and DfE (4 November 2020)
[26] SAGE, Mitigations to Reduce Transmission of the new variant SARS-CoV-2 virus SAGE-EMG, SPI-B, Transmission Group (23 Dec 2020)
[27] CDC, Hierarchy of Controls (13 January 2015)

should be rigorously applied in schools. If the new variant has a stronger forcing effect on community transmission and cases in schools then this should be met with more robust controls e.g. blended learning (substitution), serial lateral flow assays for contacts, smaller class (bubble) sizes, firebreak periods, inspections for compliance (administration), wider use of face coverings or medical masks (protective measures). Further modelling and evaluation of school testing strategies (e.g. serial lateral flow testing) with the new variant dynamics will be important as schools and education establishments reopen. In line with SAGE advice above, more work should be done with children, students, families and organisations to ensure control measures are effective, equitable, understood and achievable. SPI-B[28] and TAG[29] have previously advised on behavioural insights and increasing adherence with reference to young people. It will also be important to minimise indirect harms from these control measures wherever possible.

Schools should not be disproportionately used as a control measure for reducing Rt, particularly if existing non-pharmaceutical interventions are not being observed as well as they could be (e.g. indoor mixing). Every possible effort should be taken to reduce community, social and workplace mixing. The aim to maintain schools operations to minimise avoidable harm to children would be accompanied by a clear communication strategy that should signal to the community that there should be no wider relaxation of precautions with clearer messaging that Tier 4 means 'Stay in your home' not 'Stay at your friends' or extended family home', and reduce face to face and social contacts even for children outside school.

Annex 1 summarises the current scientific evidence related to schools and education.

[28] SAGE, SPI-B: Increasing adherence to COVID-19 preventative behaviours among young people (22 October 2020)
[29] Technical Advisory Group, Behavioural insights for contact tracing systems and young people (1 October 2020)

Annex 1: Published evidence

1. **SAGE 65[30] agreed on 4 November 2020** a clear statement on the benefits to children and young people of being able to access education effectively. They concluded:

   '*In this note, SPI-B and DfE have outlined the key evidence and considerations associated with the closure of schools. These have been grouped by theme:*

   A. Educational Outcomes

   B. Health, Wellbeing and Development

   C. Vulnerable Children and Socioeconomic Inequalities

   D. Classroom Learning Outcomes vs. Remote Learning

   It is important to note that school closures cannot be understood in isolation and tend to be accompanied by other restrictions (e.g. mixing beyond school, cancellation of sporting activities) and increased pressure on households (e.g. parents working from home, financial pressures).

   Overall conclusions

   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).'

[30] SAGE, SPI-B/DfE: COVID-19: Benefits of remaining in education - evidence and considerations (4 November 2020)

- A study in Switzerland [31] reported in November 2020 '*While secondary school pupils remain largely unaffected by the school closures in terms of learning gains, for primary school pupils learning slows down and at the same time interindividual variance in learning gains increases. Distance learning arrangements seem an effective means to substitute for in-person learning, at least in an emergency situation, but not all pupils benefit to the same degree.*'

2. **SAGE 73 held on 17 December 2020** agreed a summary of the outcome of the updated paper relating children and schools[32]. This did not include data on the VOC. The paper updated messages from SAGE 65, reinforcing the benefits to children and young people of remaining in education, and confirming already known evidence consistent with increased transmission in England occurring amongst school children when schools were open, particularly in children of secondary school age (high confidence): multiple data sources showing a reduction in transmission in children following schools closing for half term, and transmission rates increasing again following the post-half term return to school (medium confidence). It remains difficult to quantify the size of this effect, and also to quantify the level of transmission taking place specifically within the school day compared to other settings (such as wraparound activities, travel, and other social mixing when schools are open).

3. **NERVTAG held on 18 December** drew conclusions related to the new variant (B.1.1.7) which have been published.[33] The minutes state:

- '*The committee therefore has high confidence that B.1.1.7 can spread faster than other SARS-CoV-2 virus variants currently circulating in the UK.*
- *The underlying cause of that faster spread is, as yet unclear. A range of factors including the time it takes for infected people to become infectious, the amount of virus they then shed and the ability of that virus to bind to host cells are all possible contributors to the underlying observation that the new variant spreads faster.*
- *There is considerable uncertainty around other aspects of variant B.1.1.7 including the age distribution of cases and the severity of illness. Greater clarity on these issues should be available in the next few days. The lag from infections to hospitalisations and deaths means that it will take some time before there can be confidence around disease severity associated with infection with B.1.1.7.*
- *Preliminary analysis by Imperial College suggests that in children aged <15 years there may be an increase in transmission of variant B.1.1.7 compared to other variants. Modelling by LSHTM suggests that with*

[31] International Journal of Psychology, Educational gains of in-person vs. distance learning in primary and secondary schools: A natural experiment during the COVID-19 pandemic school closures in Switzerland (24 November 2020)
[32] SAGE, Children and schools update Children's Task and Finish Group: update to 4 November 2020 paper on children, schools and transmission - 17 December 2020
[33] SAGE, NERVTAG/SPI-M Extraordinary meeting on SARS-CoV-2 variant of concern 202012/01 NERVTAG (18 Dec 2020)

this variant, school closure may be needed to maintain R below 1. However, these data are preliminary, and more work is required before any firm conclusions can be reached.

- *There are currently no data on the ability of serum from patients who have recovered from COVID-19 or have been vaccinated against SARS-CoV-2 to neutralise variant B.1.1.7.This work is ongoing but will not be available for around two weeks.*
- *The committee supported ongoing urgent efforts to establish the geographic extent of B1.1.7 variant in other parts of the UK. There was particular need to establish if the increase in transmission in parts of Wales is related to variant B.1.1.7.*

4. **European Centre for Disease Control published a threat assessment brief on the new variant on 29 December**[34]. This states:

   '*While it is known and expected that viruses constantly change through mutation leading to the emergence of new variants, preliminary analysis in the UK suggests that this variant is significantly more transmissible than previously circulating variants, with an estimated potential to increase the reproductive number (R) by 0.4 or greater with an estimated increased transmissibility of up to 70%. This new variant has emerged at a time of the year when there has traditionally been increased family and social mixing. There is no indication at this point of increased infection severity associated with the new variant...*

   The importance of strict adherence to non-pharmaceutical interventions according to national policies needs to be communicated to the public, and in particular guidance on the avoidance of non-essential travel and social activities should be stressed...'

5. **Public Health England published a technical briefing report**[35] **on their investigation of the VOC on Monday 21 December**, concluding:

   '*A novel variant has been identified which has spread rapidly within the UK. We have assessed this variant as having substantially increased transmissibility with high confidence. Further studies are underway to characterise the variant and updates will be provided*. '

   '*Preliminary results from the cohort study found no statistically significant difference in hospitalisation and 28-day case fatality between cases with the variant (VOC 201212/01) and wild-type comparator cases. There was also no significant difference in the likelihood of reinfection between variant cases and the comparator group.*'

6. **ONS publications from 19**[36] **and 21**[37] **December 2020 also provided information related to the VOC**. Using data from the COVID-19 Infection Survey. This analysis showed the increasing percentage of cases that are

[34] ECDC, Risk Assessment: Risk related to spread of new SARS-CoV-2 variants of concern in the EU/EEA (29 December 2020)
[35] PHE, Investigation of novel SARS-CoV-2 variant: Variant of Concern 2020/12/01 Technical Briefings (21 December 2020)
[36] ONS, Percentage of COVID-19 cases that are positive for ORF1ab and N genes (19 Dec 2020)
[37] ONS, COVID-19 Infection Survey Ct analysis (21 Dec 2020)

positive for ORF1ab and N genes, and Ct values analysis, from 30 September 2020 to 9 December 2020. Analysis covered England, Wales, Scotland, Northern Ireland and Regions of England. This information can be used to approximate the growth of the new variant.

7. **SAGE 74 held on 22 Dec 2020**[38] concluded:

- *'R estimates continue to increase and are clearly above 1 in London, the Midlands, the South East and the East of England. It is concerning that estimates have now also moved above 1 in the South West of England where capacity to cope with increased hospital admissions is more limited. The latest estimate of R for the UK is 1.1 - 1.3. For England it is 1.1 - 1.4, for Scotland 0.9 - 1.1, for Wales 1.0 - 1.3, and for Northern Ireland 0.8 - 1.1. Doubling time estimates are currently very heterogeneous, likely reflecting a changing situation, but in some smaller areas are as short as a week.*
- *R estimates rely on lagged data and cannot yet account for the most recent impact of policy changes or any changes in transmission that have not yet been reflected in epidemiological data. These estimates may also be less accurate until more is known about the new variant B.1.1.7 (also known as variant of concern 202012/01). Changes in testing behaviours also increase the uncertainty.*
- *NERVTAG and PHE have assessed the currently available evidence on the new variant and have published their assessments and evidence. There is high confidence that this variant is spreading faster than other SARS-CoV-2 virus variants currently circulating in the UK, based on several different analyses. The cause (or causes) of that faster spread are unclear, but evidence is consistent with an increase in transmissibility being a factor. This includes some evidence of lower Ct values in those infected with this variant, which is consistent with some increase in viral load (though there are possible confounding factors). There is also some evidence that the variant is more likely to transmit within households.*
- *It is not yet known whether there is a difference in generation time or duration of infectious period.*
- *There is not yet any evidence which suggests a different disease course from other variants (data on this is likely to be available in around 10 days).*
- *It is not yet clear whether the faster spread observed with this variant is consistent across age groups, or if there is a greater increase in transmission relative to other variants in some age groups.*

[38] SAGE, Seventy-fourth SAGE meeting notes on COVID-19 (22nd December 2020)
Some of the data presented to SAGE at the meeting has also been used in the following publications:
Imperial, Transmission of SARS-CoV-2 Lineage B.1.1.7 in England: Insights from linking epidemiological and genetic data (31 December 2020)
CMMID, Estimated transmissibility and severity of novel SARS-CoV-2 Variant of Concern 202012/01 in England (23 December 2020)
Virological, Lineage-specific growth of SARS-CoV-2 B.1.1.7 during the English national lockdown (30 December 2020)

- *Whilst it is theoretically possible that the mutations might alter immune recognition, this is currently considered low probability on the available evidence. Current rates of vaccination are unlikely to significantly change the epidemiology in the near future, though this would change if rates increase as planned.*
- *There is currently no evidence of any association between the new variant and increases in transmission in particular settings (e.g. hospitals or care homes).*
- *It is important for public health that data on the sensitivity of tests to the new variant, including Lateral Flow Devices (LFDs), are publicly available. PHE reported that LFDs detect the variant with similar sensitivity to wild type virus.*[39]
- *Existing mitigation measures (e.g. social distancing, ventilation, hand hygiene and mask usage) remain important, but given the increase in risk associated with the new variant, a commensurate strengthening in the measures taken (rather than a need for different measures) may be needed (i.e. greater use of all these mitigations). There is no evidence for differences in routes of transmission or different survival on surfaces.*
- *It is highly unlikely that measures with stringency and adherence in line with the measures in England in November (i.e. with schools open) would be sufficient to maintain R below 1 in the presence of the new variant. R would be lower with schools closed, with closure of secondary schools likely to have a greater effect than closure of primary schools. It remains difficult to distinguish where transmission between children takes place, and it is important to consider contacts made outside of schools.*
- *It is not known whether measures with similar stringency and adherence as Spring, with both primary and secondary schools closed, would be sufficient to bring R below 1 in the presence of the new variant. The introduction of Tier 4 measures in England combined with the school holidays will be informative of the strength of measures required to control the new variant but analysis of this will not be possible until mid-January.*
- *The potential for the new variant to increase transmission associated with the return of universities in the new year also needs to be considered. Students are likely to begin travelling ahead of the start of term, including some who will plan to travel while there are railway engineering works taking place (which reduce capacity and therefore may reduce the ability to socially distance).*
- *Adherence will remain critical to the effectiveness of interventions, and clear and consistent policy and messaging will remain important in supporting understanding and enabling adherence.*
- *There are other variants with some of the same mutations as B.1.1.7 being identified elsewhere in the world, and global surveillance will be important, for these and for other variants. It is currently the case that*

[39] PHE, SARS-CoV-2 lateral flow antigen tests: evaluation of VUI-202012/01

in many countries the emergence of new variants may not be identified quickly due to limited sequencing capacity.

- *A variant in South Africa has some similar and some different mutations. It is spreading rapidly and has mutations that raise theoretical concerns in terms of immune recognition.'*

8. **SAGE-EMG, SPI-B, Transmission Group published evidence on potential mitigations to reduce transmission of the VOC on 23 Dec 2020[40]**, concluding:
    - *A new variant of the SARS-CoV-2 virus (VOC-202012/01, variant B.1.1.7 - 'new variant') has been identified in the UK. It is increasing rapidly in London, the East and the South East of England. While levels are currently low in other parts of the country there is a high likelihood that the new variant will spread rapidly in these areas unless stringent control measures are applied (medium confidence).*
    - *Previously identified personal, procedural, engineering and societal mitigations to reduce transmission of SARS-CoV-2 virus all continue to apply to the new variant, but are likely to require a step change in rigour of application given that the new variant is likely to represent a significantly increased transmission risk (high confidence).*
    - *It is essential to reinforce the core principles of a hierarchy of control measures to reduce physical transmission through the environment by all routes – close-range, airborne, and via surfaces, given the risks that transmission of the new variant may be higher for all these routes (medium confidence).*
    - *Primary actions to reduce transmission including: reducing social contacts; effective testing and tracing; robust outbreak identification and control; support to ensure effective isolation and quarantine; and population vaccination remain essential. Population level approaches to further reduce contact between people are likely to be necessary, such as extending Tier 4; changing the operation of schools/ universities; travel restrictions between regions and internationally; and/or introducing a national lockdown (high confidence).*
    - *As a consequence of the uncertainty around the mechanisms for increased transmission, enhanced mitigation measures are likely to be necessary including: reconsidering the 2m rule and requiring that where regular interactions less than 2m are necessary this should include correctly worn face coverings; enhancing ventilation rates to account for possible higher viral loads; and reinforcing the importance of using face coverings, including in settings where they are not currently mandated, such as education, workplaces, and crowded outdoor spaces (medium confidence).*
    - *The importance of reducing the risk of transmission through rigorously applying mitigation measures needs to be communicated to the public in the context of the increased risk of transmission and the season.*

[40] SAGE, Mitigations to Reduce Transmission of the new variant SARS-CoV-2 virus SAGE-EMG, SPI-B, Transmission Group (23 Dec 2020)

Communications should focus on alerting the public and organisations that: (a) previous levels of adherence to preventive measures are unlikely to sufficiently reduce transmission of the new variant, especially in winter; and (b) environmental and personal measures can still reduce transmission if applied more rigorously, including within the home environment (high confidence).

- *A new, intensive, culturally tailored communication and support strategy should be developed, employing rapid co-design with all sectors in society (high confidence). The strategy should focus on positively encouraging and supporting the additional behaviours required to control a more infectious virus strain, particularly: reducing indoor contacts to the lowest level possible; high adherence to testing and self-isolation if symptomatic or a contact of a case; consistent use of high-quality face-coverings whenever indoor close contact mixing is unavoidable; approaches to enable effective ventilation of enclosed spaces.*

9. Welsh Government **Guidance on protecting people defined on medical grounds as clinically extremely vulnerable from coronavirus (COVID-19) – previously known as 'shielding'**, was updated on 23 December 2020.[41] Those who are Clinically Extremely Vulnerable were advised that they should no longer attend work or school outside the home.

10. **Mobility data.** Wales mobility data around the October/November 2020 firebreak showed marked reductions in mobility[42] associated with the first week of the firebreak, which coincided with half term holidays when many parents take time off. A marked reduction in Rt was associated with the first week of the firebreak, followed by a smaller reduction during the second week, when some school operations resumed. It is not known how much influence adult resumption of activity and mixing contributed to the second week.
    - ' *Mobility data provides rapid insights into the movement of the population. Whilst the data does not demonstrate adherence, it is a useful measure of population wide response to changes in restrictions.*
    - *For example in the first week of the firebreak mobility was at its lowest since May/June. The recent introduction of further restrictions on hospitality, the closure of entertainment venues and indoor tourist attractions has also resulted in reduced mobility – but not to the same extent as the firebreak.*
    - *The percentage of Facebook users staying put (i.e. staying at/close to home all day) was 27.3% in the week after those restrictions were introduced, up from 25.6% the week before – but below the 38.1% seen in the first week of the firebreak (or the 33.2% in the second week).*
    - *Previously very large reductions in mobility have been followed by reductions in cases, as was the case with the first lockdown and the*

[41] Guidance on protecting people defined on medical grounds as clinically extremely vulnerable from coronavirus (COVID-19) – previously known as 'shielding', updated 23 December 2020
[42] Technical Advisory Group, Policy Modelling - December 2020 and January 2021 Wales TAC Policy Modelling (18 Dec 2020)

firebreak and to a lesser extent the local lockdowns. It is possible that smaller falls in mobility may not be followed reductions in cases.

- *Other factors not measureable through the mobility data such as household mixing and other social distancing behaviours are not measureable through this data.*
- *During the first firebreak schools were closed for the first week (half term), primary, years 7 and 8 returned in the second week with at home blended learning for older age groups during the second week (years 9-13 and FE).*
- *During the first firebreak, multiple analyses have shown that Rt may have dipped to a as low as 0.7 to 0.75 during the first week, making it one of the most effective measures in reducing transmission in the UK since the first lockdown.'*

The COMIX update for survey week 38[43] identifies much higher and more variable contacts that under 18's have compared to adults – and compares these between Tiers in England. Previous advice[44] from the Children and Schools TAC recommended all school age young people to reduce daily face to face social contacts by at least a half.

11. **Benefits and harms of additional NPIs.** The Wales Technical Advisory Group paper[45] from 25 November 2020 on benefits, harms and costs of some NPI interventions also draws on the detail of the 21 September SAGE 58[46] paper on NPIs and the accompanying table, with the key points below (in italics) at that time (in September 2020). At the time, the approach of closing all schools was considered to give a reduction in R of 0.2-~0.5, with moderate confidence. Closure of secondary schools was thought possibly more effective (reduction in R of ~0.35) due to links across more households, higher numbers of contacts within schools and evidence of less transmission to/from younger children. These estimates were overall, low confidence, as it was unclear how much schools may contribute to community transmission.

    - *'Cases are increasing across the country in all age groups. The effect of opening of schools, colleges and universities has only just begun to affect this increase. Even so, the latest data suggests that the doubling time might be as low as 7-8 days. COVID19 related hospitalisations and intensive care bed usage have started to increase.*
    - *As over 90% of the population remain susceptible not acting now to reduce cases will result in a very large epidemic with catastrophic consequences in terms of direct COVID related deaths and the ability of the health service to meet needs. As in the first wave, the burden of a large second wave would fall disproportionately on the frailest in our society, but also those on lower incomes and BAME communities.*

[43] CMMID, COMIX Study - Week 38 report (23 December 2020)
[44] Technical Advisory Group, Advice on return to school (9 July 2020)
[45] Technical Advisory Group, Summary of evidence on costs and benefits and potential mitigations for measures to address COVID-19 in Wales (3 Dec 2020)
[46] SAGE, Summary of the effectiveness and harms of different non-pharmaceutical interventions (21 Sept 2020)

- *A package of interventions will need to be adopted to prevent this exponential rise in cases. Single interventions are unlikely to be able to reduce incidence. If schools are to remain open, then a wide range of other measures will be required. The shortlist of non-pharmaceutical interventions that should be considered for immediate introduction include:*
- *A circuit-breaker (short period of lockdown) to return incidence to low levels.*
- *Advice to work from home for all those that can.*
- *Banning all contact within the home with members of other households (except members of a support bubble)*
- *Closure of all bars, restaurants, cafes, indoor gyms, and personal services (e.g. hairdressers)*
- *All university and college teaching to be online unless absolutely essential.*
- *Although beyond the scope of this paper, the rapid rise in cases means that a raft of complementary measures is required to reduce transmission in care homes, hospitals and other enclosed settings, such as prisons and hostels for the homeless.*
- *All these interventions listed above have associated costs in terms of health and wellbeing and many interventions will affect the poorest members of society to a greater extent. Measures will be needed urgently to mitigate these effects and to achieve equity and social justice.*
- *The more rapidly these interventions are put in place the greater the reduction in COVID-related deaths and the quicker they can be eased. However, some restrictions will be necessary for a considerable time.*
- *Clear, consistent communications will be essential, and a consistent package of measures should be adopted that does not appear to promote contradictory goals.'*

12. **The Wales Children and Schools Technical Advisory Cell evidence review on children and young people[47] from 13 November 2020** recommended:
    - '*School based controls and existing recommended NPIs, that are well coproduced and planned to promote adherence, are essential to maintain infection control and limit transmission rates in preschool, schools and FE under age 18. Additional mitigations should be considered including ways of reducing daily face to face contacts to reduce exposure risk, and the possibility of wearing face coverings for older age groups in more circumstances, including on public and dedicated transport. This could even include in the classroom on a risk assessed basis, where effective social distancing cannot be maintained, balancing benefits with harms to overall wellbeing of*

[47] Technical Advisory Group, Evidence review on children and young people under 18 in preschool, school or college following the firebreak (13 Nov 2020)

students, and in conjunction with local resilience forum decision making.

- *Consideration should be given to exploring the feasibility of mass asymptomatic testing programmes in school and college settings to enhance infection control and maintain confidence of students, parents and staff. The development of any testing programme should take into consideration background infection rates, the full spectrum of available testing technologies, the context of community testing and balance of strategic priority and testing capacity.*
- *Schools, colleges and childcare facilities should be maintained as covid secure workplaces for all staff (teaching and non-teaching). Clinically extremely vulnerable (CEV) staff should follow CMO guidance about working from home if possible, or ensuring workplace mitigations. Infection Prevention and Control (IPC) guidelines for intimate care and PPE use should be observed at all times.*
- *Staff and students should be supported to understand the importance of controls on social mixing and reducing the number of daily face to face contacts, especially outside the controlled educational environment, to reduce risks of infection. This incudes on journeys to and from schools, and during extracurricular activity or gatherings in formal and informal educational situations.*
- *Staff at schools, colleges and care facilities should engage with students and families to communicate and mitigate the risks of infection during all activities associated with childcare, schools and FE. The communication strategy should follow the COM-B approach, to help motivate a sense of agency and adherence to Infection Prevention and Control (IPC) principles in childcare, schools and colleges, as well as promoting underpinning attitudes of community altruism towards young people. This could help promote engagement with strategic priorities for young people's future wellbeing, and adherence to other personal restrictions that allow schools and colleges to operate safely and effectively.*
- *Additional data analysis and research /modelling should be commissioned, of specific school age cohorts to address key identified unanswered questions relating to the balance between infection control and effective education for school and FE students under 18. This should include an updated estimate of the effect on R of all age groups up to 18 during school opening.'*

13. **Testing Strategies:** The published NERVTAG report from 18 December and the ECDC report both make reference to ongoing work to assess the effectiveness of LFDs to detect the VoC.[40] Wales[48] has announced a plan for January 2021 serial testing of bubble contacts as a mitigation to minimise school absence due to self isolation for students and teachers to reduce avoidable harm from absence or transmission in school settings.

[48] Welsh Government, Press Release - Welsh Government announce plans for serial testing in schools and colleges from January (14 December 2020)

14. **TAG Wales advice summary 23 December 2020**[49] concluded that :

- *'A new variant of coronavirus has been identified in the UK, including Wales. Evidence suggests the new variant is easier to transmit, although there is no evidence that it causes more severe disease. All current guidance around symptoms, social distancing, self-isolation and vaccination applies to the new variant. The Technical Advisory Group and Public Health Wales continue to work as part of the UK investigation to better understand the implications and consider an appropriate response. A separate technical summary on the new variant can be found here*[50]*.*
- *The most recent estimate of the Reproduction number (Rt) for Wales from SAGE (as of both 16th and 22nd December 2020) is predicted to be between 1.0 and 1.3, with the epidemic estimated to be growing by between 1% and 4% per day. These values have increased since the last report. It should be noted that these figures may be an underestimate due to the planned system maintenance of the NHS Wales Laboratory Information Management System which resulted in the delayed reporting of 11,000 positive tests.*
- *The Rt value is estimated by Public Health Wales to be 1.2 (23rd December 2020), with doubling time estimated to be 19.1 days. As above, whilst this figure includes the backlog cases, due to the planned system maintenance, trends for this week should be interpreted with caution, as should short-term changes more generally.*
- *There is currently no evidence that the variant is different in severity, or differs by characteristics of sex and ethnicity. The SAGE subgroup NERVTAG stated that there are currently insufficient data to draw any conclusion on the age distribution of cases and the European Centre for Disease Control threat assessment from 20 December says the cases with the VOC-202012/01 variant are predominantly currently identified in people younger than 60 years*
- *There is an ongoing investigation into the role of children in transmitting this variant.'*

15. Safety of Teaching and Schools Staff and potential for protection

- ONS data comparing infection rates by occupational groups[51] has identified teaching and school staff at statistically similar risk to other key workers. An ONS additional ad-hoc analysis on data from 2 September (the start of the school year) to 16 October 2020 shows no evidence of differences in the positivity rate in England between primary and secondary school teachers, other key workers and other professions.

[49] Technical Advisory Cell, Summary of Advice (23 December 2020)
[50] Technical Advisory Group, Brief on the viral variant VOC-202012/01 (23 December 2020)
[51] ONS, Coronavirus (COVID-19) Infection Survey, UK (6 November 2020)

- The "other key workers" category includes the following occupations: resident-facing care home workers, patient-facing and non-patient facing healthcare workers, protective service occupations.
- A Scottish study of teachers[52] in December 2020 showed that the risk of becoming a COVID-19 case was higher among teachers than the general population following the re-opening of schools in Scotland. This outcome counts those who test positive, those who are admitted to hospital, intensive care, or who die. Since there was no increase in hospitalisation, intensive care unit admission or death, this difference can be attributed to an increase in the risk of testing positive for SARS-CoV-2. This risk varied over time, with a lower risk of testing positive pre-closure, and in lockdown, and no difference in risk after easing of restrictions but before schools re-opened.

16. Vaccination rollout

The NHS in Wales are vaccinating people in order of clinical risk.[53] This programme is following the latest advice from the Joint Committee on Vaccination and Immunisation.[54]

[52] Public Health Scotland, Report of record linkage study of COVID-19 among teachers, healthcare workers and other working-age adults (16 December 2020)
[53] Coronavirus (COVID-19) vaccination programme, information on Welsh Government website
[54] Joint Committee on Vaccination and Immunisation, advice on priority groups for COVID-19 vaccination, 30 December 2020