Technical Advisory Group

Considerations to mitigate risk of increased COVID-19 transmission during the Senedd and Police and Crime Commissioner elections

19 March 2021
CMO and TAC evidence paper: Considerations to mitigate risk of increased COVID-19 transmission during the Senedd and Police and Crime Commissioner elections

Purpose: The aim of this paper is to outline the behavioural, environmental and modelling considerations relevant to the Senedd and Police and Crime Commissioner (PCC) elections and how to mitigate the risk of increased COVID-19 transmission.

Summary of advice:

- The epidemiological situation could change between now and early May, with different levels of community infection, vaccine coverage and effectiveness, and associated restrictions in place. This will potentially impact on preparations (e.g. greater promotion of postal voting to minimise risk if infection rates were to be high). Evidence and guidance will need regular review.

- Postal voting is considered to present a lower risk of transmission (high confidence), however may create operational and equality issues. We would advocate the strong promotion of postal voting for people currently on the shielding list.

- This advice should be considered alongside the lifting of other restrictions as part of the 21-day review.

- If infection rates are low, polling stations and counting centres are well ventilated and risk assessed, voter and official density is managed carefully, infection prevention control measures are adopted and enforced, and any social distanced queuing takes place outside, in-person voting activities should carry a low risk of infection (high confidence). Campaigning activities also require consideration of these mitigations.

- The model assumes that individuals increase the number of contacts on the day of the election. Results are shown until end of March 2022, however the further into the future we project, the greater the level of uncertainty.

- When considering the two options of 6 May and 8 July, we see that there is very little impact for both of these options on the estimated cases, hospitalisations and deaths related to COVID-19. This is because they are both at relatively low prevalence levels using the scenario in this model. As we look further into the future however, we are less confident in these estimates. We therefore consider that there is higher confidence that 6 May will have low prevalence, as it is closest to the current restrictions that are controlling the virus.

- Deaths and hospital occupancy are also relatively low at the beginning of May, however are higher with low levels of adherence.

- Evidence from recent Welsh Government commissioned focus groups has suggested diverse views when asked about the election, reinforcing the need for clarity of messaging to explain the position taken and what this means in practical terms.
• Preparations should begin as early as possible, including practical arrangements, public messaging and communications.

• This paper provides more detail within the following three areas:

  o **Environmental considerations (Section 1)** including: campaigning; types of voting; risks and mitigations of polling stations (voter management, staff protection, venue adaptation); risk and mitigations of counting centres; recommendation.

  o **Behavioural considerations (Section 2)** including: considerations with regard to adherence and associated impacts on transmission; public messaging; evidence from elections taking place elsewhere (including experiences of council by-elections in Scotland in October and November 2020) and current evidence gaps.

  o **Findings from TAC modelling (Section 3)** including: modelled outcomes of scenarios considering the timing of the election.

**Current evidence gaps identified**

We note the following evidence gaps would support the evidence base for this paper.

• How might voter turnout be impacted by changed intention because of the pandemic?

• What additional evidence is there from other elections that could help to inform the approach taken?

• What do we know about current and predicted levels of postal voting and capacity to process an increase in the numbers voting this way?

• How likely are people to maximise the social contact opportunity ordinarily afforded by voting?

• What are the additional risk behaviours that could be discouraged?
Section 1: Environmental considerations to mitigate risk of increased COVID-19 transmission during the Senedd and Police and Crime Commissioner elections

Here we present guidance on the COVID-19 safe use of polling stations and associated election campaigning in relation to the upcoming May elections in Wales. A range of issues which may increase disease transmission are highlighted alongside potential mitigation options to minimise this risk. We note that the COVID-19 situation may change from the time this guidance note was written and early May when the Senedd and PCC elections take place. This might include changes in disease prevalence at both a national and regional level, the emergence and prevalence of new/current variants of concern/mutations, and the success of the vaccine programme roll out. These factors are all likely to impact upon the guidance presented here. We therefore recommend that this guidance is reviewed on a regular basis.

Campaigning
With May elections due to take place in England as well, The Cabinet Office have published “The Government’s Approach to Elections and Referendums During COVID-19”. Whilst the guidelines apply to England, we would recommend following similar principles on campaigning in Wales. These are broadly:

- Campaigning can take place from March 8th, 2021 following a set of guiding principles to keep campaigner numbers down, to maintain social distancing, to not enter any households, to not participate if self-isolating or symptomatic and where possible to run meetings/planning remotely by phone or digital means. A summary can be found here.
- Under UK Government guidance, it is clear that under the current national lockdown, leafleting by party activists it not admissible. In Scotland, under their plans, leafleting could start from 15th March, 2021 if sufficient progress is made for the current rules on socialising to be eased to allow outdoor meetings of four people from two households. Campaigners should adopt the appropriate Covid-19 transmission minimisation practices. There are summarised here for England. Current guidance for Wales is here. We would recommend summarising Welsh general guidelines in a more succinct “how to stop the spread of corona virus” summary covering: distancing, hygiene, face coverings, ventilation.

Type of voting
There are three different ways to vote; in person, by post or by proxy. All three have different risks, issues and benefits. In relation to postal voting, the deadline for application for postal voting is 20th April, 2021. Raising early awareness of how to register for postal voting and looking at ways to simplify this process is critical. We would also advocate the strong promotion of postal voting for people currently on the shielding list.

Risk & Mitigations of Polling Stations
In-person voting presents a potential opportunity for SARS-CoV-2 transmission by bringing many individuals together from many different households to interact with staff over the course of a single day.

Since postal voting is considered to present a lower risk of transmission (high confidence) the first option to mitigate this risk is to promote the use of postal voting as a first preference to reduce the numbers of individuals required to attend polling stations. However, this may in turn create operational issues with postal delivery,
sorting and calculations and may cause issues with inequality. A feasibility study for postal vote capacity should be looked at to ensure any increase in postal votes is able to be catered for, whilst also communicating with those who are not able to undertake mail posting votes, for whatever reason, to ensure they have a suitable alternative. Furthermore, to reduce the risk of infectious individuals attending stations, robust arrangements for emergency proxy voting for individuals who are self-isolating due to COVID-19 should be made and communicated widely to the electorate.

Staffing plans for polling stations and counting centres should also include contingency cover in case of key staff unavailability due to self-isolating at short notice. Consideration should be given to the risk demographics of volunteer staff and their potential willingness and availability to staff polling stations and counting centres. There should also be consideration paid to any requirements for trace test and protect.

Polling stations are deployed in a range of different location types. We advise each polling station be subjected to a COVID risk assessment by its presiding officer with the assistance of local authorities and environmental health officers. Polling stations are high-footfall areas which can be managed by drawing upon lessons identified from LFD mass testing and vaccination centres.

To mitigate the risks of SARS-CoV-2 transmission at polling stations we identify three main control measures:

1. Voter management

   The maintenance of 2 metre social distancing and reduction of time indoors at the venue represent essential mitigations (high confidence). Each polling station will need to consider its safe capacity and the flow of individuals through the polling station from arrival to departure to maintain a minimum of 2 metres social distancing at all times.

   The safe capacity of each stage at the station must be identified, and how to manage the flow of individuals giving careful consideration to avoiding pinch-points within the process. This will require clear marking and marshalling to direct voters from the entrance to exit, having someone who is able to, and authorised to, manage potential non-compliance may be of benefit. A one-way flow of voters with different entrance and exits is preferable, but should this be impossible in a given venue, marshalling to prevent congestion will be required. Consideration should also be given to using a different location or outdoors. To keep within the safe capacity of the polling station, queues must be managed outside with 2 metre social distancing, with voter entry cohorted to minimize time indoors within the safe capacity of the station.

   Face coverings should be required from arrival when at the queue and a supply of suitable face coverings and their safe disposal on offer to help support this. Hand sanitizer stations should be placed at key points, and their regular use recommended and promoted. There is the risk of non-compliance to current NPI’s such as face covering wearing etc. and so again, having someone who is able to and authorised to manage non-compliance may be of benefit.

   As mentioned in SAGE, the proper fit and wearing of masks are an issue as well as education of face shields. This may present an opportunity to educate on the proper wearing/fit of masks, the type of masks that are effective, and the role of face shields whilst queuing. A review of face coverings should be aligned and reviewed to new variants of concern at the time.
2. Staff protection

Polling station staff and official visitors/tellers will be expected to work indoors at the polling station for long periods of time, relative to voters, and to interact with many voters over the course of the day. Consequently, they will receive greater exposure to finer aerosols which may potentially contain SARS-CoV-2. While maintaining 2 metre social distancing represents an important control measure to minimise exposure, this should be supplemented with effective infection prevention and control training, with emphasis on protective behaviours and correct use of PPE. The ensemble of sessional PPE allocated for asymptomatic testing or vaccination staff (e.g. type IIR fluid resistant surgical mask, eye protection, apron, gloves if in direct contact with materials handled by voters) is indicated as a supplement to full length Perspex screening. Arrangements for the safe disposal of used PPE should be made at stations. A review of face coverings should be aligned and reviewed to new variants of concern at the time the elections take place. Transmission risk from voters to other voters can be minimised by short dwell times, hand hygiene, use of face coverings, reduction of touch points and social distancing. However, because polling station staff members will be in situ for longer, protective equipment, perhaps similar to that used in LFD testing centres, should be considered as a COVID-19 control for staff. Making LFD’s available to staff would further enhance confidence and prevention. The impact of COVID-19 on first aid provision at polling stations should also be considered.

3. Venue adaptation

The size and design of voting centres varies greatly, each presenting their own benefits and issues with regards to transmission risks and effectiveness of mitigations. Initial risk assessments identifying suitable locations or alternative polling stations or use of temporary shelters such as a marquee which includes safe distances to queue, space to vote whilst social distanced, two doors etc. would bring benefit in minimising transmission risk. A follow up risk assessment would help identify maximum station capacity and other considerations such as signage and where to locate PPE/hand sanitizer items and whether additional polling booths are needed for social distancing would enhance also COVID-safe voting.

SAGE identifies effective ventilation as an important means of reducing longer-range transmission of SARS-CoV-2. Due to the time and available capacity of an individual polling station, it may be challenging to undertake a full risk assessment which includes airflow patterns and air turnover rates etc. at all stations. Therefore, ensuring the station is well-ventilated or even over-ventilated is preferable to insufficient ventilation. Consideration is given to thermal comfort, and staff should ensure their level of clothing is suitable for the weather of the day. Expedient enhancement of ventilation entails identifying all safely openable windows and doors and ensuring they are kept open throughout the day.

Contact with contaminated items represents a potential transmission pathway, although this presents lower risk. This risk can be mitigated by regular and effective hand hygiene and rigorous cleaning protocols. For voters, this would entail the use of hand sanitizer at key stages through their visit alongside the effective wearing of masks/face coverings. For staff it would include the regular use of hand sanitizer and handwashing and appropriate protective equipment, therefore handwashing training
and facilities should be made available. Risk assessments also need to cover toilet facilities for staff and visitors and areas for staff to have breaks away from voting stations.

The number of touch points at a centre should be minimized, for example by pinning open doors where possible, which also enhances airflow. Remaining touch points include voting papers, booths and pencils/pens. SARS-CoV-2 inactivation on porous media such as paper and wood is relatively rapid (with a four log reduction from a concentrated dose of virus (~ 6.8 log TCID50 ml⁻¹) within 30 minutes on paper and six hours on wood; Chin et al. 2020). The amenability of voting booth structures to regular disinfection should be considered. For example, the placement of plastic coverings/mats on voting booth surfaces may have benefits of being easier/more effective to clean than wooden booth surfaces. The benefit of regular cleaning after each voter should be identified within a risk assessment. There are benefits from regular cleaning such as reducing transmission risks alongside drawbacks of increasing voter dwell time. Whilst asking voters to bring their own pens, a system should be implemented to ensure the availability of disinfected pens/pencils for those who do not bring their own to ensure there is no inequality. One example could be by rotating writing implements in cycles with disinfection by immersion (preferable) or wiping in 70% alcohol between uses should be adopted.

A risk has been identified around queueing to vote. It has been highlighted that queueing outdoors brings many potential benefits, especially when social distanced. Therefore, there is a need to identify areas to allow suitable social distanced queueing which is managed to ensure compliance. There is also an argument about the impact of rain/heat/inclement weather etc. and this is something the risk assessment should take into account as well as routes for those who are vulnerable or have accessibility issues (especially in the rain/extreme heat).

There may be benefit to testing voters with LFDs before allowing entry into polling stations, however it is felt this benefit is outweighed by the drawbacks that this may cause concern in terms of confidentiality and putting people off attending to vote, disadvantage of increased timings and also the availability of LFDs.

Risk & Mitigations of counting centres

The potential for SARS-CoV-2 transmission at counting centres has also been identified. Chiefly these risks arise from in-person contact at the centre. Access should be restricted to the minimum essential number of persons for the purpose of ensuring a proper and transparent election process. Where possible, these should work in bubble shifts and not come into contact with other working members.

As above, each venue should be risk assessed to ensure contact is minimized and two metres distancing and effective ventilation is maintained also taking into account the different activities such as break areas and toilet facilities. Given the rapid inactivation of the virus on paper, residual risks from counting papers should be managed by regular, effective hand hygiene. Staff should wear three-layer face coverings at all times. A review of face coverings should be aligned and reviewed to new variants of concern at the time the election takes place. Consideration to the availability of volunteers and contingencies for staff unavailability should be given.

As in the current guidelines, there should also be attention paid by those who are running for office to consider not attending the counting centres with a big entourage to celebrate, as this may impact upon public trust as well as create a potential risk as cited in events guidance.
Recommendations
Recommendations have been broken down into the three main areas of risk as well as the type of voting:

Type of voting
1. Encourage members of the public to register and use postal voting.
2. Undertake a feasibility study to ensure the postal and counting systems are prepared effectively to cope with any uptake whilst finding ways to make the application process simpler.
3. Develop a fast track system for proxy nominations for those who are self-isolating/symptomatic and/or cannot attend the polling stations in person - including on-the-day nominations.
4. Develop a campaign for those on the shielding list to register for postal voting and how to do it.

Voter management
5. Reviewing the potential for increasing opening times in polling stations to enable a spread of voters visiting and reduce flow problems and the number of people in the area.
6. Offering of face masks/coverings and hand sanitiser.
7. Ensure that current social distancing (Inc. one-way systems), mask/face covering wearing and cleaning of hands on arrival/exit be practiced and enforced at all times.
8. Consider the cohort of voters.

Staff protection
9. Make LFD testing available to staff before and after session.
10. Full length Perspex screens and full PPE (Similar to those at vaccination and LFD testing stations) should be given to officials to minimise direct exposure to respiratory-derived aerosols and potentially contaminated surfaces.
11. Develop a role to manage entry, queue management, and educate on the proper fit of mask, type of mask and face shield and to manage non-compliance.
12. Media campaigns should be run stating the process for attending polling stations from recommendations.

Venue adaptation
13. An initial risk assessment to identify any suitable/unsuitable polling stations and consider layout(2 exits, room to queue, effective ventilation; whether that is alternative venue or option for a temporary marquee with sides up) followed by a more in-depth risk assessment. These should be carried out at each station to identify max capacity etc. and the responsibility for doing the risk assessment should be made clear.
14. Voting should take place in well ventilated open plan rooms with good air flow, or alternatively outside in semi-enclosed spaces such as marquees with sides up which should be captured in the risk assessment.
15. Voting booths should be socially distanced (2 m) and have a plastic mat to them to make them easier to clean and should be cleaned with an appropriate disinfectant after each attendee.

16. Develop options to identify ways to minimise contact with used pens: such as bring your own pen, single give away pens, pens get washed by officer on exit etc.

17. Ways to reduce queues and the proximity of people during queuing must be identified.

**Risk & Mitigations of counting centres**

18. Undertake risk assessment of location to ensure suitability of ventilation, facilities, and social distancing etc.

19. Minimise the number of people on site and ensure robust face coverings, social distancing, hand cleaning etc.

**References**

- [https://doi.org/10.1016/S2666-5247(20)30003-3](https://doi.org/10.1016/S2666-5247(20)30003-3)
- [https://pubs.acs.org/doi/10.1021/acs.estlett.0c00966](https://pubs.acs.org/doi/10.1021/acs.estlett.0c00966)

**Section 2: Behavioural considerations to mitigate risk of increased COVID-19 transmission during the Senedd and PCC elections**

**Summary**

- This note covers issues associated with holding the Senedd and PCC elections – not just those associated with the option of delaying. Clearly the epidemiological situation could change between now and early May, with different levels of community infection and associated restrictions in place. This will potentially impact on preparations (e.g. greater emphasis on promotion of postal voting to minimise risk were infection rates to be high).

- In summary, if polling stations are well ventilated, voter density is managed carefully and queuing takes place outside, the act of voting should carry a low risk of infection.

- There are numerous environmental issues that TAG colleagues will be considering in relation to voting in person. These range from venue location, size and ventilation, provision of pencils that are usually shared, sanitation, signage, opening hours, queueing system, maximum capacity etc., all of which will be critical in reviewing venue selection and modification where possible to do so. An example of a very simple mitigating action could be to encourage people to bring their own pencil.
• Previous SAGE advice on reducing household transmission has emphasised the importance of producing plans, such that local authorities should start preparing as early as possible while literature should also stress the need to remember a face covering, sanitise hands, maintain 2 metre physical distance, while also reinforcing the availability of postal voting. Packs to provide to those responsible for polling stations should be produced as early as possible, using appropriate service design expertise to incorporate the issues noted above and a checklist to risk-assess venues could be developed. Given voter turnout is typically variable, those polling venues previously experiencing higher turnout could be split on this occasion, with messaging explaining why this has happened.

• In terms of postal voting, it will be important to assess current capacity, the likely increase given current circumstances and plan to meet the likely additional demand as far as is feasible.

• An overarching theme is the importance of communication and in particular, provision of a clear rationale for decisions taken or public advice. This emphasis on ‘why’ may appear obvious but is consistent with advice from SPI-B throughout the pandemic (see for example with reference to lifting restrictions) and has also been a theme emerging from Welsh Government commissioned focus groups. In this particular case, it would be important to provide a clear public message as to why the elections are taking place in the midst of a pandemic (with arguments about the importance of the democratic process being followed), why a delay is thought necessary (if appropriate), that voting is a personal issue and should not be seen as a social event, why doorstep canvassing is deemed to be important and safe etc.

• Public messaging will also need to reinforce the effectiveness of protective behaviours to date and should be continued in order to keep community transmission low. This is especially important as more people are vaccinated and may see themselves as lower risk and stop taking the public health measures to reduce COVID-19 transmission including wearing face coverings in indoor public places, social distancing, and avoiding high-risk locations.

• Public messaging will also need to explain the process for attending polling stations and potentially reassure voters that the necessary mitigations will be in place to manage the infection risks. Communicating why decisions are being taken i.e. to hold the election at this time, is consistent with advice from SPI-B (the behavioural sub-group of SAGE).

• It would also be helpful to use communication channels to help people with revised social etiquette given existing norms around behaviours such as greeting people. Scottish Government have developed materials on this that may be helpful.

• In addition to voters, it would be important to avoid outbreaks among party officials and election volunteers. Pre-testing of officials working in polling stations may be a wise precaution to minimise the risk of infection.
• It is assumed that the current arrangements for press briefings continue given the importance of factual messaging and visible leadership and that the pre-election guidance allows for this.

• Evidence from recent Welsh Government commissioned focus groups has suggested diverse views when asked about the election. For example, one argument centred on the concern that holding an election would be a distraction from the everyday efforts of responding to a public health emergency. Another view was the potential for ‘politicalisation’ of the pandemic response, the concern that decisions could be influenced by what might result in short-term electoral gains at the expense of a longer-term outlook (e.g. lifting existing restrictions too quickly). This is potentially important given evidence around trust in government and the way people behave. It should be noted that others reported no concerns over holding the election but this range of positions reinforces the need for clarity of messaging to explain the position taken and what this means in practical terms.

• There are various considerations with regard to adherence and associated impacts on transmission, recognising there is little evidence.
  
  o Given the current election is more than a year into the pandemic, with people enduring an extended period of restrictions (including the winter months) and the associated mental strain, it is possible some people could see voting as a means of seeing friends/family (e.g. calling in on the way to the polling station), particularly if infection rates continue to fall. It is possible, in the circumstances, the potential to see some familiar faces could increase voter turnout.

  o Additionally, the average age of voters tends to be higher\(^1\) and these groups have been vaccinated, so may be feeling protected. Reinforcing the need to follow protective behaviours following vaccination would be advisable. A behavioural focus should extend beyond the voting booth to the wider system in which the elections are taking place. Behavioural risks and mitigations should be identified at the earliest opportunity. A similar approach has been taken recently with the re-introduction of face-to-face teaching for younger pupils and messaging around behaviours ‘at the school gates’.

  o Equally, it remains a possibility that voter turnout is lower than usual given people may be more cautious than in previous elections. This could be challenging and thought will need to be given as to how best to encourage people to vote via the various mitigations that can be put in place.

• In terms of on the day communications to reinforce the points raised above, there is potential for geo-targeted digital work similar to the schools example noted above. This would not be appropriate to be Welsh Government led but

---

\(^1\) Although it is recognised 16-17 year-olds are eligible to register to vote in 2021
may be an option for the Senedd or Electoral commission. Furthermore, it should be possible for all parties’ election materials to emphasise the importance of minimising risks by following key protective behaviours if voting in person or highlighting the availability of postal voting.

Evidence from elsewhere

- Evidence from the recent US presidential election suggests that it should be possible to hold one in Wales without any major risk to infection rates. While there was an upsurge of infections it is believed this was part of an on-going surge and there is no evidence suggesting a causal effect.

- Links have been made in the US between specific activities and the election, notably rallies\(^2\) and impacts on polling officials\(^3\). However, rallies of the scale seen in the US are highly unlikely in Wales.

- Looking further ahead, analysis commissioned by the International Institute for Democracy and Electoral Assistance\(^4\) has looked at various aspects of the US election, including voter registration and lessons learned.

- A recent blog by the Electoral Commission\(^5\) notes that across the world, numerous elections have been successfully conducted since the start of the pandemic, with countries adapting and expanding existing models (notably voting in advance) rather than introducing untested systems at short notice. Wales is well set with established processes to vote in advance and by proxy. Early communication is highlighted as being key and an example of good practice is provided from the Eden-Monaro by-election in Australia. Additional training for polling officials was provided in the US. With this in mind, the electoral commission published a set of objectives for undertaking elections in the current public health situation in late 2020\(^6\).

- Closer to home, the Electoral Commission also looked at the experiences of council by-elections in Scotland in October and November 2020\(^7\). They concluded:
  - Elections can be conducted safely but additional steps are necessary to ensure advice around physical distancing, hand hygiene and the use of face coverings is followed at key election events.

---

It takes more time to plan and costs more to deliver – arrangements will need to be robust and adequately resourced.

Venues and staffing are crucial – venues need to allow for physical distancing and sufficient staff will be required to assist with key aspects of the election.

Early engagement with key stakeholders including political parties, candidates and agents, as well as suppliers, is important.

Many voters are still choosing to vote in person - communications will need to make clear polling stations are safe, that there are a range of voting options available and postal votes should be applied for early.

Section 3: Modelling the timing of elections in Wales

TAC Modelling Sub-Cell

1. Summary

- This paper considers whether it is preferable to hold Senedd and PCC Elections on 6 May or 8 July.
- This advice should be considered alongside the lifting of other restrictions as part of the 21-day review. The model assumes that individuals increase the number of contacts on the day of the election.
- We have previously seen rapid changes to transmission rates in Wales and internationally and this is now even more likely given the prevalence of the more transmissible variant B117 (known as the 'Kent variant') in Wales.
- Testing in advance and/or a 10 day pre-isolation period for those who will have increased contacts (e.g. those counting ballots) is likely to reduce onwards transmission from an election, notably those included in the counting processes.
- The impact of transmission is likely to have the lowest impact if prevalence of COVID-19 is lowest. The modelled estimates therefore recommend that the preferred election date should be on 6 May. This is because it is closest to periods of restrictions which are currently reducing the spread of the virus.
- This paper does not consider potential behavioural impacts on adherence to restrictions in place, however a ‘high’ and ‘low’ adherence has been included to illustrate its potential impact. Low adherence adds around 10% of contacts in addition to restrictions in place at that time.

2. Objective

The objective of this paper is to examine a scenarios for COVID-19 in Wales from March-December 2021 which include the impact of an election; alongside different assumptions around the impact of new variants, impacts of vaccinations, and different levels of restrictions as well as individuals’ ability to continue to adhere to
restrictions and to continue to adopt protective behaviours (labelled in this paper as ‘adherence’). We have adapted the timetable of the UK Government roadmap for this analysis to consider the impact of elections on 6 May or 8 July.

3. Background

Wales went into level 4 restrictions on 20th December 2020 following the identification of the new Variant of Concern 202012/01, increasing rates of confirmed COVID case rates, and pressure on the NHS. Over 31% of the population of Wales have now received one dose of a vaccine, including over 94% of over 80 year olds. This is expected to lead to a reduction in hospitalisations and deaths in vaccinated groups, if transmission does not increase above the level it has been previously. So far during 2021, schools across Wales have been providing remote learning to pupils, except for vulnerable children and the children of critical workers. There is good evidence that the impacts on children of not attending school are significant in terms of education as well as physical and mental health, and Welsh Ministers have indicated that they intend for schools to be the first to re-open following the lockdown.

4. Evidence Summary

Current evidence from SAGE and SPI-M and ECDC suggests that the new variant VOC 2020/12/01 (B117 or Kent variant) may have increased transmission with a relative Rt advantage of 0.4 to 0.7. This may be seen particularly when Rt is above 1, which means that Wales might see more rapid acceleration in cases as restrictions are released. Analysis by Public Health Wales suggested that it took longer for the Rt of the new variant to move below 1 in January 2021 than for previous wild type variants. There is also concern about other new variants which have E484K mutations, and around the South African variant. A recent SPI-M consensus statement around schools reopening suggests that schools may add from 10% to 50% to the Rt number when opened fully, with most models suggesting transmission and susceptibility is lower in teenagers than adults, and lower in younger children than in teenagers. However primary schools returning to face to face teaching means that parents may also be more likely to return to work or have more contacts. Recent SPI-M papers have suggested there is a very real threat of a third wave of COVID-19 even with the vaccination programme being relatively successful, particularly in terms of hospital admissions where more than a quarter are in younger age groups. If vaccine uptake is less than 100%, and the vaccine is less than 100% effective, and the R0 for new variants is around 4, then a loosening of restrictions could lead to a rapid acceleration of virus transmission and an increase in pressure on the NHS. However, it may be that seasonality of the virus and outdoor mixing will

8 Written Statement: Alert level four restrictions
9 Technical Advisory Group: considerations for changing the operation of schools to allow more face-to-face learning, 5 February 2021; Minister for Education, Open letter to headteachers, 5 February 2021.
11 SPI-M-O, Statement on relaxation of NPIs and the re-opening of schools, 27 January 2021, and reaffirmed in SPI-M-O, Consensus Statement, 10 February 2021; see also https://cmmid.github.io/topics/covid19/reports/comix/Comix%20Weekly%20Report%2043b-%20Effect%20of%20school%20opening.pdf
add to the factors that favour lower transmission as we move towards the Summer. The modelling in this paper aims to look at the impact of different scenarios for a return to face-to-face learning in schools between February and June 2021, including comparing a ‘slow step up’ to a full return to classrooms with a ‘fast step up’, when combined with other uncertainties, particularly around the efficacy of the vaccine, the impact of new variants on the transmissibility of the virus, the levels of adherence to restrictions and to reducing close contacts in general (described as ‘adherence’), and the wider restrictions in place for Wales during the period. The modelling attempts to estimate the likely impacts of these different scenarios and underlying assumptions for cases, hospitalisations, ICU occupancy and deaths in Wales. The data outputs shown in this paper currently run until end of June / beginning of July.

5. Updated modelling scenarios from Swansea University

Swansea University produced a set of modelled scenarios for the time period up to end of December 2021. The SU model is based on the dynamic transmission model COVID-UK, prepared and published by Davies et al at the Centre for Mathematical Modelling of Infectious Disease (CMMID, London School of Hygiene and Tropical Medicine). Full details of the model are available in https://github.com/cmmid/covid-uk.

Briefly, the COVID-UK model structure is:

- Stochastic, tracking up to 66.4 million people at the UK level over time steps of 6 hours, hence the output is probabilistic and a distribution of outcomes can be obtained from a fixed set of parameters.
- Age-structured into 16 age bands, with demographics provided at the local authority level.
- There are 6 Disease states: Susceptible (S), and after successful transmission Exposed (E) but not infectious. After a latent period approximately 50% of infectious individuals are asymptomatic (Is), while the rest enter a pre-clinical, but infectious state (Ip) followed by a clinical symptomatic infectious state (Ic) followed by isolation and recovery (R). The waiting times in each state are gamma distributed.
- Age-specific hospitalisation rates, fatality rates, and duration of hospital stay, estimated from the early stages of the pandemic are used to monitor the impact of the epidemic and health service capacity.
- A detailed description of the transmission between individuals based on measured social mixing patterns provided by the POLYMOD study. Contact matrices are provided for home, school, work and community, all stratified by age band.
- The force of infection at time t for an individual is then given by the product of the susceptibility to infection upon contact and the number of contacts per day (all age specific).
- Scenarios are explored by scheduling changes to the number of contacts expected in each age group, and how this varies over time, for example when
schools open/close, when lockdown measures dramatically decrease contacts, and when relaxation gradually increases the contact rate.

- Following modifications to allow for flexible initial conditions and flexible scheduling of combinations of interventions over long time periods, the version of the model being used is available on Swansea University's code repository (https://github.com/sa2c/covid-uk).

The key considerations which vary between the different scenarios which have been modelled are as follows.

**Level of restrictions in place across Wales**

The Welsh Government has set out 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. Wales has been in Level 4 restrictions since 20 December 2020. We have used an UK roadmap adapted to decision dates in Wales to consider the events over a longer term. The scenarios modelled in this paper assume the following scenario for the level of restrictions that would be in place across Wales during this period:

- Alert level 4 until end of March,
- Alert Level 3 until 12 April 2021,
- Alert level 2 until 17 May,
- Alert Level 1 until June 21,
- Alert Level 0 (fully open) from then on.
- Election day (6 May 20 and 8 July 20) is set as a day of Alert Level 0.

**Effectiveness of vaccines**

The scenarios modelled in this paper all set out a range of possibilities for how effective vaccine is against clinical events and transmission: either 60%, 75%, or 90% effective. This is represented in each figure by a band representing the lower, central, and upper estimates for cases, hospitalisations, ICU occupancy and deaths in each model.

**Levels of ‘adherence’**

Each of the scenarios modelled in this paper is presented twice, side-by-side. The ‘adherence’ levels in these scenarios are modelled on the assumption of both:

- ‘Good adherence’ (where ‘adherence’ is at a level equivalent to what was seen during the autumn firebreak in Wales)
- ‘Low adherence’ (where ‘adherence’ is at a level equivalent to what was seen during December 2020 in Wales)

In this analysis, low or good adherence is in reference to individual’s numbers of contacts, which may change as a result of motivation to comply, but also depending on ability to comply, for instance if workplaces require them to return to working on-site. So it is not only about adherence with the rules, but also how many contacts people are having which may still be within the rules. We know that so far in the

---

12 [Coronavirus Control Plan: Alert levels in Wales](14 December 2020).
pandemic, adherence has been high and there has been a huge collective effort to reduce contacts, take precautions (such as meeting outside, wearing face covering, handwashing, etc) and control the virus. In these scenarios, good adherence is similar to the reduction in contacts seen in the October 2020 firebreak, while poor adherence is more like the number of contacts seen in December 2020.

**Impact of Variants**

Three levels of impact of new variants have been included; old variant, where the virus behaves as it did up until around November 2020, NV_0.4 where the new variant initially adds around 0.4 to the Rt number (but this will change over time based on transmission dynamics) and NV_0.6 where the new variant adds around 0.6 to the initial Rt number. Current analysis from England suggests that the new variant may add around 0.4 to 0.7 to the Rt number, but this would be if the new variant was 100% of cases, and the background R0 in Wales may be slightly lower than in England because Wales has more people in rural areas, so 0.6 is felt to be a sensible high value to use in the modelling.

**Model assumptions for these scenarios**

**Schools scenarios:**
- Slow step up: 10%, 20%, 30%, 50%, 75%, 100%
- Fast step up: 10%, 20%, 50%, 100%, 100%, 100%
  - ie: Step dates are after: Feb half term, 15th March, Easter holidays, 5th May, Whitsun half term, 28th June.

**Vaccine uptake:** 90% in all scenarios in all ages

**Vaccine schedule:** actuals until end February, then 15,000 per day. Model is first dose effect only at the moment. No second dose included yet.

**Vaccine effectiveness:** 60, 75, and 90 per cent

**Behavioural Adherence:** Low (equivalent to Christmas period – contacts increased by approximately 10% on top of restrictions) and High (equivalent to firebreak)

**Level Schedule:**

We have used an UK roadmap adapted to decision dates in Wales to consider the events over a longer term.

Alert level 4 until end of March, Alert Level 3 until 12 April 2021, Alert level 2 until 17 May, Alert Level 1 until June 21, Alert Level 0 (fully open) from then on. Election day is set as a day of Alert Level 0.

6. **Results Summary**

Results are shown until end of March 2022, however the further into the future we project, the greater the level of uncertainty.

This scenario approximates to the UK Government ‘roadmap’ for England; Level 4 restrictions until end of March 29, Level 3 until April 12, Level 2 until May 17, Level 1 until June 21, Level 0 (fully open) from then on. It may well be that Wales is more cautious than this in the pace of unlocking – or indeed that the dates change in England – but this gives an approximate scenario of restrictions being eased over time as more people are vaccinated and COVID-19 prevalence hopefully continues to decline.

Under these scenarios, cases and other outcomes start low in April and raise from May onwards. Outcomes start to reduce in June.
The impact of transmission is likely to have the lowest impact if prevalence of COVID-19 is lowest. The modelled estimates therefore recommend that the preferred election date should be on 6 May, rather than the 8 July. This is because it is closest to periods of restrictions which are currently reducing the spread of the virus.

Deaths and hospital occupancy are also relatively low at the beginning of May, however are higher with low levels of adherence.

The following figure illustrates the impact of an election on 6 May.

Figure 1. Trend in outcomes in Wales for UK scenario, with good/low adherence, varying effects of new variants (coloured curves), school step up, and different vaccine efficacy (areas around trend lines).

1A. Daily cases.

1B. Hospital ICU admissions (COVID positive cases).
1C. Hospital non-ICU occupancy (COVID positive cases).

1D. Deaths.