

Coronavirus (COVID-19): Scientific evidence on schools and ELC settings

Introduction

1. The Scottish Government has made it clear that decisions in relation to the relaxation of restrictions imposed as a result of Coronavirus (COVID-19) will be, first and foremost, tested against the scientific evidence and public health advice that is available. This paper sets out what advice we have considered, and the evidence we are drawing on. It focuses on the evidence and advice specifically relating to transmission and exposure, and does not include discussion of wider public health advice in relation to, for example, health inequalities or behaviours, or on educational impacts of school closures.

2. That evidence is being built internationally, across the UK and within Scotland. The principle sources of evidence and advice are the Scottish COVID-19 Advisory Group, the World Health Organisation (WHO), the UK Government's Scientific Advisory Group for Emergencies (SAGE), the Children's Task and Finish Working Group (a sub-group of SAGE), Public Health Scotland and lessons from international experience. It is for SAGE and its Children's Task and Finish Working Group to publish their papers and advice. Detailed discussion of those is not in scope of this paper.¹

3. The WHO set out three broad areas to consider when looking at reopening of schools, alongside consideration of other harms from continued closure²:

- Current understanding about COVID-19 transmission and severity in children
- Local situation and epidemiology of COVID-19 where the school(s) are located
- School setting and ability to maintain COVID-19 prevention and control measures

4. This paper aims to be transparent on those aspects which are not well understood, and make clear that in some cases the science does not provide us with a definitive view on the situation or the best course of action. The Scottish Government also considers a range of other advice when making decisions, including stakeholder views, and engagement with the people of Scotland.

Children and COVID-19

5. There is ongoing discussion of the way in which COVID-19 directly affects children, and the role they play in its transmission both to other children and more widely in society.³ Children need to be considered not as a single, homogeneous group but should be differentiated by age (as a minimum). The behaviour of children under the age of 5 will differ significantly from that of young adults, as will their experienced impacts of interventions and clinical response to COVID-19.⁴ The current agreed position on the evidence is that it is generally less well developed

¹ SAGE papers are being published in batches here:

<https://www.gov.uk/government/groups/scientific-advisory-group-for-emergencies-sage-coronavirus-covid-19-response>

² <https://www.who.int/publications-detail/considerations-for-school-related-public-health-measures-in-the-context-of-covid-19>

³ See for example:

https://www.learn.ed.ac.uk/webapps/blackboard/content/listContentEditable.jsp?content_id= 4649571_1&course_id= 77596_1

⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/886993/s0141-sage-sub-group-role-children-transmission-160420-sage26.pdf

than for adults. However, at the time of writing the position can be summarised as follows⁵:

- Younger children may be less susceptible to infection from COVID-19 than adults. However, the underlying evidence on this is not strong. There is insufficient evidence to determine whether older children have differing susceptibility to infection from adults. Data suggests positivity rate of tests for COVID-19 carried out in children has been far lower than for other age groups.⁶ Less than 1% of positive tests in Scotland are accounted for by people aged under 15.⁷
- There is a growing amount of evidence that the susceptibility to clinical disease of younger children is lower than for adults. As with susceptibility to infection, there is not enough evidence yet to determine whether susceptibility to disease is different in older children to adults.
- There is generally good evidence that the severity of disease in children is lower than in adults. The latest NRS data shows that, up to 17 May 2020, there have been no COVID-19 deaths registered amongst people aged under 15 in Scotland.⁸
- There is no evidence to suggest that children transmit the virus any more than adults. Some studies suggest younger children may transmit less, but this evidence is inconclusive.

6. International evidence, where it exists, indicates children are less likely to contract COVID-19 and symptoms tend to be milder.⁹ However, individual studies often conclude differently with some showing lower rates of infection and others suggesting similar rates to adults. As evidence develops in this area – perhaps aided by the partial reopening of schools and other education settings in the UK and elsewhere – we may be able to alter the pace at which we change the approach to schools and childcare.

7. There has been reference to emerging international evidence that small numbers of children have developed paediatric inflammatory multisystem syndrome (PIMS-TS). Both the Scottish Advisory Group and SAGE agreed that further information is needed and to monitor the evidence base as it develops.¹⁰

Understanding the impact of reopening schools and ELC settings

8. A range of modelling and analysis has been undertaken in support of scientific discussion on COVID-19 in the UK and Scotland, and its likely progression. There are different approaches to such modelling, and consequently a range of evidence to

⁵ See for example: WHO, *ibid*

⁶ <https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-18-may-2020/>

⁷ <https://beta.isdscotland.org/find-publications-and-data/population-health/covid-19/covid-19-statistical-report/>

⁸ <https://www.nrscotland.gov.uk/covid19stats>

⁹ See for example:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/886997/s0291-dutch-parliament-role-of-children-in-transmission-220420-sage31.pdf

¹⁰ <https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-14-may-2020/>

consider.¹¹ The uncertainty around some aspects of how COVID-19 affects children also impacts on the modelling. There are also different metrics that can be examined, including R_t , the number of cases and deaths. R_t is the rate of reproduction and it tells us the average number of people that would be infected by one individual with the virus. Models alone cannot provide “the answer” to questions on whether or not settings should reopen. Any health risks associated with school return need to be balanced against the harms of missing education and childcare.

9. At UK level, SPI-M¹² provides modelling as an input to SAGE discussions. They have looked at options for relaxations including possible approaches to reopening education and ELC settings. These models did not factor in physical distancing within schools, or the wider consequences of reopening (for example by changing the behaviour of adults) or children’s contacts outside of school. On that basis, they showed that in general, options involving younger children and/or fewer children had a lower impact on R_t than those involving older children or larger volumes of children. For example, reopening ELC in full had a lower impact than primary schools, and both had lower impacts than reopening secondary schools in full. Reopening secondary schools was shown to account for around half of the total impact of reopening all schools and settings. Models with partial attendance (e.g. “rota” based attendance) also had relatively lower impact.¹³

10. The Scottish Government conducts its own modelling of the status of COVID-19 in Scotland e.g. estimates of R_t ¹⁴. Estimates of R_t and the level of the infectious pool in Scotland are important to take in to consideration when deciding on the lifting of lockdown measures. How this relates to schools, based on data as at 8 May, is set out in Annex A. The latest data on cases and deaths are available on the Scottish Government website

11. It may be that adherence to existing measures in the broader community is more important than the approach taken to returning children to settings.¹⁵ The Framework for Decision-making¹⁶ was clear that, despite some limitations, such modelling showed that fully reopening primary schools and ELC settings in May presented too great a risk, pushing R_t above or too close to 1. An increase beyond 1 would risk exponential growth in the number of new cases, hospitalisations and deaths, causing very significant harm to Scotland’s health, society and economy.

12. Internationally, a number of countries are taking a regional approach, due to differences in epidemics and estimates of R_t . Modelling of options has suggested that there may be scope for reopening some education and ELC provision in some form over the coming weeks when the number of infectious people is expected to be significantly lower, whilst keeping R_t below 1. Further, the modelling suggests that approaches to reopening which employ a “rota” type attendance system may be

¹¹ See *Covid-19: Modelling the epidemic in Scotland* for a description of these models

¹² <https://www.gov.uk/government/groups/scientific-pandemic-influenza-subgroup-on-modelling>

¹³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/887014/s0300-tfc-modelling-behavioural-science-relaxing-school-closures-sage31.pdf

¹⁴ <https://www.gov.scot/publications/covid-19-modelling-epidemic-scotland/>

¹⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/886994/s0257-sage-sub-group-modelling-behavioural-science-relaxing-school-closures-sage30.pdf

¹⁶ <https://www.gov.scot/publications/coronavirus-covid-19-framework-decision-making/>

effective at reducing transmission chains and the potential impact.¹⁷ However, the combined impact of this and any other easing measures needs to be considered alongside evidence against the four harms as well as the practicalities of implementation. The 'Coronavirus (COVID-19): framework for decision making - supporting evidence' publication¹⁸ sets out more detail on the harms and impacts that are being considered.

Preventative measures

13. The WHO recommend that “prevention and control strategies” should be maintained in open, or partially open, schools¹⁹, albeit that specific circumstances and limitations should be taken into account. They are not prescriptive about those measures, recommending a risk-based approach. In the Scottish context, the key issues are:

Physical distancing

14. Practise on physical distancing varies in different countries. WHO have outlined a minimum distance of 1m, and from this, different countries have employed different minimum distances which they advise their citizens to maintain. For example, in Singapore and Hong Kong it is 1m, whilst in Australia it is 1.5m. The USA advises 1.8m (the equivalent of 6 feet) and the UK, Ireland and New Zealand favour 2m. In each case, governments state that their advice is based on the scientific evidence underpinning the control of pandemics²⁰. The actual rule in place is influenced by each country's tolerance of risk.

15. A number of European countries have developed and shared advice around physical distancing and hygiene measures for use in schools and ELC settings. WHO state that provision should “maintain a distance of at least 1 metre between everyone present at school.” The Danish Health Authority (DHA) updated its guidance on physical distancing and, in consideration of the current stage of the outbreak there, now deems a distance of 1 metre sufficient in most cases to align with WHO guidelines and neighbouring countries. Physical Distancing will remain in place up to and including at least Phase 3 of Scotland's route map.

16. There is little or no evidence on the impact of physical distancing on transmission in schools. The majority view of the Chief Medical Officer's Advisory Group is that actions to support distancing guidance in schools in situations where children are in indoor environments for extended periods of time would be appropriate to consider. However, there was a minority view that, once the timing was appropriate to enable opening of schools in any form, physical distancing may not be a necessary measure and that fully reopening schools should be considered. The Group noted the increasing weight of evidence that children are not as badly affected by the virus and may be less implicated in its transmission.

17. It is not appropriate or possible for the youngest children to follow the models of physical distancing that would be suitable for older children. In particular, it is not

¹⁷ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/886994/s0257-sage-sub-group-modelling-behavioural-science-relaxing-school-closures-sage30.pdf

¹⁸ <https://www.gov.scot/publications/covid-19-framework-decision-making-supporting-evidence/>

¹⁹ WHO, *ibid*

²⁰ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7197539/>

desirable or possible to implement strict physical distancing between young children or between a young child and their key worker. Alternative, age appropriate public health measures such as smaller groupings, minimising contacts between groups and enhanced hygiene may be put in place that help mitigate the risk of transmission and infection. The overall goal should be containing the virus within communities, quickly identifying cases, and driving down numbers.

18. Whilst each country's experience of the virus is different, we can learn from their experiences. The return of children to the equivalent of ELC settings in Denmark and Norway included the use of small groups (to limit the number of close contacts between child and staff), increased use of outdoors, enhanced handwashing routines on arrival and throughout the day, enhanced cleaning regimes and removal of items which cannot easily be cleaned, staggered arrival times, and more closely managed parental access.

Personal Protective Equipment (PPE)

19. For some key frontline workers outwith the NHS – such as staff working in education and childcare settings - delivering essential public services can mean that physical distancing is not always practical and that there may be circumstances where there is a need for PPE for close contact (within 2 metres). The use of individual and organisational risk assessments at a local level must be used to inform the need for and use of PPE, and should include droplet and contact infection risks. The use of PPE by staff within education and childcare settings must be based on a clear assessment of risk and need for an individual child or young person.

20. HPS guidance for non-healthcare settings²¹ makes clear that staff should continue to use PPE in line with current health and safety policies and risk assessments. Staff should only wear PPE when it is appropriate to the task they are undertaking. The exception is where, following an individual or organisational risk assessment it is found that a higher level of contamination, such as respiratory secretions, may be present or the risk assessment identifies that there is an identified need for PPE then it should be readily available and provided in line with Health and Safety guidance.

Testing and contact tracing

21. Scotland's route map²² is clear that we want to have a test, trace, isolate, support system – Test and Protect – in place before we significantly ease restrictions. The approach in our Strategic Framework for Reopening Schools, early Learning and Childcare Provision²³ is predicated on the existence of supporting public health measures, including effective testing and contact tracing.

²¹ <https://www.hps.scot.nhs.uk/web-resources-container/covid-19-guidance-for-non-healthcare-settings/>

²² <https://www.gov.scot/publications/coronavirus-covid-19-framework-decision-making-scotlands-route-map-through-out-crisis/>

²³ <https://www.gov.scot/publications/excellent-equity-during-covid-19-pandemic-strategic-framework-reopening-schools-early-learning-childcare-provision-scotland/>

22. The '[Coronavirus \(COVID-19\): test, trace, isolate, support strategy](#)' was published on May 4th 2020. It sets out our approach which is designed to help us interrupt chains of transmission in the community by identifying cases of COVID-19, tracing the people who may have become infected by spending time in close contact with them, and then supporting those close contacts to self-isolate, so that if they have the disease they are less likely transmit it to others. Testing will allow people to know whether or not they have the virus.²⁴

23. This is a necessary supporting intervention to manage the virus in Scotland. It is possible that such an approach may lead to a risk of higher than normal rates of absence amongst staff due to positive test results. This risk will need to be managed by education providers.

Local flexibility

24. Scotland's route map keeps an open mind about the potential for regional variation, in general. The situation in terms of prevalence and transmission may vary across the country. Local level monitoring and data could be important to provide information on the level of transmission/number of cases in the community, and to enable local decisions about schools being open/closed based on this data. Test and Protect could play a valuable part in this.

Individuals who are, or who are in a household where someone is, shielding

25. Following the closure of schools and ELC settings for most children in March, guidance was provided on the position for children and staff who are shielding, or in households with someone who is shielding.²⁵

26. There is no evidence which suggests the position in relation to this should change. Therefore, the latest public health guidance on shielding will continue to form the approach to attendance at an education or ELC setting as they begin to welcome back more staff and young people.

Going forward

27. We will continue to monitor the scientific evidence and advice and use it to inform decisions on further changes to the restriction in relation to schools and ELC providers. The research and evidence base is changing and growing quickly, and we will build-in an appropriate mechanism and capacity to review our approach as it evolves. This will include learning from the experience of other countries, including in the UK, as they begin to reopen some of their education settings and children's services.

28. Developing an approach to monitoring the impact of changes to the school and ELC restrictions, including prevalence of cases, public health impacts and on education issues such as attendance, will be an important part of the phased return.

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²⁴ <https://www.gov.scot/publications/coronavirus-covid-19-getting-tested/pages/overview/>

²⁵ <https://www.gov.scot/publications/coronavirus-covid-19-physical-distancing-in-education-and-childcare-settings/pages/education-provision/>

Annex A – SG simulation modelling of ELC and primary schools returning in June or August.

This annex sets out the results of a Scottish Government run of the Imperial College Scenario Model Code, using data from the experience of Norway and Denmark on the impact of opening Schools on COVID-19 cases in Scotland. The modelling is based on data up to 08 May, includes the potential impact on wider community of school reopening, and implicitly assumes that the same precautionary measures are in place as per those in Denmark and Norway. A different approach to reopening, timing or preventative measures would likely result in a different modelled outcome. The modelling does not consider the practical implications, or wider costs/benefits, of any option.

Simulating forward, using those data up to 8 May, to opening primary schools and ELC settings on 1 June²⁶ indicates that there would be around 18,000 infectious people in Scotland compared to over 25,000 had it been lifted in mid-May. This results in a low enough effect in the uplift in Rt to look promising²⁷. If the number of infectious people or Rt is in reality has not fallen to those levels at the point of reopening, then a different, potentially greater, impact would be observed.

Before	0.86	confidence range (0.78-0.94)
After	0.86	confidence range (0.77-0.97) ²⁸

Modelling the same scenario for 13 August opening when forecasts indicates that there would be around 5,000 infectious people in Scotland:

Before	0.85	confidence range (0.78 -0.91)
After	0.85	confidence range (0.77 -0.94)

However, due to the top of the confidence range being close to one, caution is needed. Lifting other interventions (e.g. on economy or social restrictions) at the same time would need careful consideration as the impact of interventions on Rt is cumulative and could raise Rt over 1.

Options comparison

In light of the modelling work shown above, it would be safer to make limited changes initially at the start of June and examine its effects. The options that are the lowest risk would be those with restricted numbers of children (e.g. transition years) or younger children (e.g. nurseries). It may be possible to do these things in combination with another relatively low risk easing of other restrictions.

There is therefore scope in the overall R in Scotland to fully open ELC settings and primary schools in June, but that would mean a significant risk, especially if other options were eased at the same time.

ENDS

²⁶ This date was picked for illustrative purposes

²⁷ For reference, the same scenario for May suggested R would have risen substantially above 1

²⁸ The range is wider as there is inherently more uncertainty around the post-intervention estimates