

EVIDENCE BRIEF

(ARCHIVED) Evidence on School Reopening in the Context of Variants of Concern and Select Approaches in England and Ireland

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Key Messages

- COVID-19 modelling studies demonstrate closure of educational institutions contributes to some reduction in the reproduction number at the population-level. Wave one modelling studies suggest that school closures had a substantial effect on reducing community transmission of SARS-CoV-2. Modelling studies that incorporated data and policy context from wave two suggest that closing schools has a less substantial impact than closing other community-based settings and implementing other public health measures outside of schools. No modelling studies summarized in this evidence brief account for the context of VOC.
- The closure of schools to in-person learning have known negative and inequitable consequences for children and youth, and their families. Mitigating strategies for at-risk children and families are important for prolonged periods of closure to in-person learning.
- In late February and early March 2021, Ontario experienced a period of increasing community incidence and increasing prevalence of Coronavirus Disease 2019 (COVID-19) Variants of Concern (VOC), including an observed increase in cases in school-aged children and youth (4-17 years), following concurrent provincial reopening of schools and relaxation of restrictions in other settings in some regions in mid-February. Over this time period, the number of reported school outbreaks also increased.
- Between January 31 and April 17, 2021, there have been 463 school-associated outbreaks with at least one case with a VOC-associated mutation or VOC lineage confirmed. The number of

school-associated outbreaks as well as the size of outbreaks with at least one case with a VOC-associated mutation or VOC lineage has increased over time. Overall, the median number of cases per outbreak with a VOC-associated mutation or VOC lineage confirmed was higher.

- Following stringent, long duration (8-9 weeks) national lockdowns aimed at reducing widespread surges in Coronavirus Disease 2019 (COVID-19) cases in the context of VOC, England and Ireland integrated reopening of educational institutions in their national-level reopening plans and prioritized reopening schools for in-person learning before reopening any other sectors. While prioritizing school reopening, England and Ireland maintained stringent measures for other sectors for 5-6 weeks, respectively.
- Following the reopening of schools, Ireland and England have managed to maintain their gains and avoid surges in the rate of COVID-19 cases. Both countries have moved into broader reopening of other settings in their communities. In the context of effective vaccines and their impact going forward, longer-term plans for recovery for the whole-of-society are valuable to consider as vaccination coverage increases in adults, while considering the risks for unvaccinated children.¹

Issue and Research Question

This evidence brief examines recent literature and summarizes select jurisdictional approaches to reopening schools after a period of closure due to a surge in prevalence of variants of concern (VOC).

The Government of Ontario implemented a province-wide Stay-at-Home order on April 8, 2021.² Additional restrictions were implemented on April 17, 2021. The order requires everyone to remain at home except for specified purposes, such as purchasing grocery or pharmacy items, accessing health care services (including getting vaccinated), for outdoor exercise, or for work that cannot be done remotely.² On April 12, 2021, the Government of Ontario announced that schools provincially would switch to remote, online learning starting on April 19, 2021 (after the planned April break).³ It is important to draw upon evidence and jurisdictional experiences regarding reopening schools and other community settings after a period of closure.

There are known negative impacts of community-based public health measures, such as stay at home orders and school closures, on the health and mental health of children and families.^{4,5} These negative impacts include lack of access to school nutrition and healthcare services, unhealthy movement behaviours and nutrition (e.g., low physical activity, ultra-processed, calorie-dense diet, excessive screen time), and impacts on parent and child mental health.^{4,5} An understanding of the unintended consequences of public health measures can help to inform the planning of mitigation strategies and approaches to the implementation or prioritization of public health measures.

European jurisdictions, such as England and Ireland, implemented stringent national lockdowns (for a period of at least two months) that helped to reduce widespread surges in COVID-19 cases in the context of VOC. These two jurisdictions have subsequently started to relax stringent community-based public health measures, starting with the return to in-person learning in schools.⁶⁻⁹ Lessons can be learned from these jurisdictions to inform a gradual, measured, safe return to in-person learning that considers prevention measures in-school and epidemiological context at the time of reopening, while maintaining the gains of COVID-19 control in the broader community.

Methods

This evidence brief includes three sources of published evidence: a grey literature search; peer-reviewed modelling studies on the impacts of school closure and reopening selected by Public Health Ontario

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(PHO) subject matter experts; and previously published PHO environmental scans on the relaxation of community-based public health measures in the VOC context. In addition to these three sources, data was extracted by PHO on Ontario's epidemiological context.

Grey literature records were obtained between April 22 and April 26, 2021 from hand-searching recent policies, media articles, government websites, official press and reports. Epidemiological indicators are also summarized in this brief and represent the most recent week of complete reporting from the jurisdictions included.

The data for the Ontario epidemiological context were based on information extracted from the Public Health Case and Contact Management Solution (CCM) for all public health units (PHUs) by PHO. CCM is a dynamic disease reporting system, which allows ongoing updates to data previously entered. As a result, data extracted from CCM represent a snapshot at the time of extraction and may differ from previous or subsequent reports. For more information on data sources and caveats, please see **Appendix A**.

Main Findings

Evidence on epidemiological impact of school closure and reopening

Several modelling studies conducted using epidemiological data and non-pharmaceutical interventions (NPIs) from wave one found that the closure of schools helped to decrease SARS-CoV-2 transmission (measured by a reduction in the reproduction number [R]).¹⁰⁻¹² While it is a challenge to isolate the impact of schools closures from other NPIs, the studies summarized here have attempted to do so. **Haug et al. (2020)**, **Brauner et al. (2021)**, and **Li et al. (2021)**, found that the closure of schools was effective in reducing R.¹⁰⁻¹² **Li et al. (2021)**, also modelled the association between lifting NPIs and COVID-19 transmission, and found that reopening schools could increase transmission by 24% (R 1.24, 1.00–1.52) by day 28 after reopening.¹¹

Other modelling studies that incorporated epidemiological data and NPIs from wave two, found that school closures had a smaller effect on rates of SARS-CoV-2 transmission (measured by a reduction in R), when compared with other community-based NPIs. **Sharma et al. (2021)** conducted a wave two modelling study on the effectiveness of NPIs implemented in European jurisdictions between August 2020 and January 2021, and found a relatively small effect of school closures on reducing R (7% reduction in Rt [95% CI: 4-10%]) in comparison to the closure of other public settings (e.g., banning gatherings reduced Rt by 26% [95% CI: 18-32%], stricter mask-wearing policies reduced Rt by 12% [95% CI: 7-17%]).¹³ This study noted that the small effect may be explained in part by the safety measures (e.g., screening, testing, contact tracing) implemented in schools across Europe.¹³ Finally, **Naimark et al. (2021)** estimated that the effect of opening schools on COVID-19 cases was substantially lower than the effect of other community-based NPIs, between September 1 and October 31, 2020.¹⁴ Across the modelled scenarios, they found that less than 5% of COVID-19 infections among students and teachers were acquired within schools.¹⁴

It should be noted that these studies did not take into account the context of VOC. For a summary of the key findings of these studies, please see **Appendix B**.

Ontario epidemiological context

- A total of 277,032 confirmed cases of COVID-19 were reported in Ontario from August 30 to March 13, 2021. School-aged children (i.e., ages 4-17 years) accounted for 10.1% (27,855/277,032) of these cases. School outbreak-associated cases linked to outbreaks reported

between August 30 and March 13, 2021 accounted for 9.4% (2,629/27,855) of all cases in school-aged children reported within this period.¹⁵

- From mid-February to mid-March 2021, increasing rates of COVID-19 were observed in school-aged cases in children and youth aged 4-17 years, as well as those aged 18 years and older. In the context of increasing community incidence, the number of reported school outbreaks also increased over time from mid-February to mid-March 2021.
- There have been 801 school-associated outbreaks in 30 public health units between August 30 and March 13, 2021, noting that a school outbreak is generally defined as at least two cases in a school in a 14-day period with at least one case reasonably acquired at school. The total number of cases associated with these outbreaks is 3,634, which includes students and staff. The median number of cases per outbreak was 3 and the maximum number of cases associated with a school outbreak was 60. Two or fewer cases were reported in 43.9% (352/801) of these outbreaks and six or more cases were reported in 22.2% (178/801, of which 119 related to outbreaks with 6-9 cases and 59 related to outbreaks with 10 or more cases) of these outbreaks. Elementary schools account for 75.5% (605/801) of school-associated outbreaks and 72.7% (2,641/3,634) of cases associated with school outbreaks; for context, elementary schools account for 76% of K-12 schools in Ontario.¹⁵
- Among school-aged cases, there is a trend of increasing rates of COVID-19 with increasing levels of neighbourhood ethnic concentration, with the most racialized neighbourhoods having rates that are approximately 4.1 times higher than rates in the least diverse neighbourhoods. Rates were 1.9 times higher in the most deprived neighbourhoods compared to the least deprived.

Further details on these analyses can be found in Public Health Ontario's [Enhanced Epidemiological Summary: COVID-19 in Ontario: Elementary and Secondary School Outbreaks and Related Cases, August 30, 2020 to March 13, 2021](#).¹⁵ Data on percent positivity, including age-specific estimates, are published routinely by ICES through their [COVID-19 dashboard](#).¹⁶

Additional Ontario epidemiologic data during 2021 in-person learning

- There have been 463 school-associated outbreaks with at least one case with a VOC-associated mutation or VOC lineage confirmed between January 31 and April 17, 2021 (and 204 school outbreaks with no associated VOC mutations or lineages in the same time period). Universal testing of all COVID-19 (i.e., SARS-CoV-2) PCR-positive specimens with a cycle threshold value of ≤ 35 was implemented at PHO for the N501Y mutation (a VOC-associated mutation) starting February 3, 2021. Overall, the median number of cases per outbreak with a VOC-associated mutation or VOC lineage confirmed was higher (median=3, interquartile range [IQR]: 2-5), compared to outbreaks without a VOC-associated mutation or VOC lineage confirmed (median=2, IQR: 2-3).
- As incidence in the community increases, so does the number of school outbreaks in that same area. In the period of time when schools were open (varying dates due to phased school reopening in Ontario by PHU), the estimated number of regional (i.e. PHU) school outbreaks increased by 8% for every increase of 10 cases per 100,000 in the region (Incident Rate Ratio=1.08, 95% Confidence Interval [CI] 1.05-1.11). This estimate was larger than observed in the Fall 2020 semester (Incident Rate Ratio=1.04, 95% CI 1.03-1.06). See **Appendix C**.

Jurisdictional scan: reopening schools in England and Ireland

ENGLAND

Reopening Schools in England

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- Starting on March 8, 2021 (see epidemiological context below), England proceeded as planned with the first step of their four-step plan to lifting COVID-19 restrictions under the government's *COVID-19 Response Spring 2021: Roadmap out of lockdown*.^{8,9} The first step of England's reopening plan prioritized reopening schools to in-person learning.^{8,9} The national government is assessing whether it is safe to move forward with each step of the plan using the following four conditions: Vaccine program goes as planned; evidence shows vaccines are reducing the number of deaths and hospitalizations; infection rates do not risk a surge in hospital admissions; and new variants do not change the risk of lifting restrictions.^{8,9} Further details on England's reopening plan, can be found in the **Appendix D**.
- Between March 8, 2021 and March 29, 2021, school settings were the only community-based setting that had reopened in England.^{8,9,17,18} On March 29, 2021, three weeks after schools reopened, a few additional lower-risk, outdoor settings relaxed measures (six people were permitted to meet outdoors, outdoor sport facilities reopened, and local travel was permitted).¹⁹ On April 12, 2021, five weeks after schools returned to in-person learning, England reopened other community-based settings (e.g., non-essential retail, personal care services).²⁰
- As planned, on March 8, 2021, students at all school levels (roughly equivalent to primary to grade 10 in Canada) and colleges (roughly equivalent to high school in Canada) returned to in-person learning.^{8,9,17,18} Students also returned to university in programs that must be delivered in-person (e.g., practical or practice-based programs).¹⁷ Alongside reopening, additional measures were implemented in schools including masking for students in year 7 (roughly equivalent to grade 6 in Ontario) and above, and asymptomatic testing.¹⁸

Epidemiological context

- On March 8, 2021 (the first date that schools began to reopen), the rate of cases per 100,000 in a 7-day period was 58.5 per 100,000 population.²¹ On March 29, 2021 (three weeks after schools reopened), the rate of cases in a 7-day period had lowered slightly to 57.5 per 100,000 population.²¹ This rate of cases three weeks after reopening may be explained in part by the increased access to testing for secondary school aged students and primary and secondary school teachers, during the return to school. On April 12, 2021 (five weeks after schools reopened), the rate of cases in a 7-day period was reduced further to 29.1 per 100,000 population.²¹ On April 23, 2021 (most recent full date of Public Health England's reporting), the rate of cases in a 7-day period was reduced further to 24.8 per 100,000 population.²¹
- On March 8, 2021 (first day that schools reopened), the share of England's total population who received at least one dose of the COVID-19 vaccine was 34.1%.²² On March 29, 2021 (three weeks after schools reopened), the share of England's total population who received at least one dose of the COVID-19 vaccine was 46.4%.²² On April 12, 2021 (five weeks after schools reopened), the share of England's total population who received at least one dose of the COVID-19 vaccine was 48.6%.²² On April 26, 2021 (most recent available data), 50.4% of England's total population had received at least one dose of the COVID-19 vaccine,²³ and 20.2% of England's total population had been fully vaccinated against COVID-19.²²

- As of April 14, 2021, there were 178,359 total confirmed cases of B.1.1.7 lineage in England (since September 20, 2020).²⁴ As of April 28, 2021, there were 226,635 total confirmed cases of B.1.1.7 lineage in England.²⁴ The most recent UK Infection Survey from the Office for National Statistics (published on April 23, 2021), reported that the percentage of people in England testing positive compatible with the B.1.1.7 lineage decreased from the previous week of reporting;²⁵ however, B.1.1.7 remains the most common VOC in England, with the next highest VOC being B.1.351 with 737 total confirmed cases as of April 28, 2021.²⁴

IRELAND

Reopening Schools in Ireland

- Ireland's *COVID-19 Resilience and Recovery 2021: The Path Ahead* sets out a phased plan for exiting the "Level 5" lockdown measures which have been implemented nationally since December 30, 2020.^{6,7} This plan prioritized schools and childcare as the first settings to reopen, ahead of other community-based settings, with a staggered return to in-person learning starting on March 1, 2021 (see epidemiological context below).⁶ Ireland took the following approach to reopening to: make steady progress, starting with childcare and schools, while avoiding a further wave of disease and re-imposition of restrictions; protect the most vulnerable through vaccination; remain vigilant and agile regarding the uncertainties in the face of new variants; and lay the foundations for the full recovery of social life, public services and the economy.⁶ Further details on Ireland's reopening plan, can be found in **Appendix D**.
- The public health criteria used to consider easing restrictions for other community and business settings in Ireland are: disease prevalence at lower levels that can be managed and controlled by public health (with an R at or below 1); hospital and critical care occupancy reduced to levels that allow for the safe resumption of non-COVID-19 care; progress on the vaccination program to protect the most vulnerable through vaccination; and emerging information on VOC.⁶
- The first six weeks of reopening (March 1 to April 12, 2021) focused exclusively on the phased resumption of childcare services and the return of students to in-person learning.⁶ A staggered approach began with the youngest primary students and oldest post-primary students returning to in-person learning (roughly equivalent to grades K-2, and grade 12 in Ontario). This was followed by childcare services for pre-school aged children, then remaining primary school students (grades 3-6) and the second oldest post-primary school students (grade 11), then all remaining early learning and childcare services. The final phase of the school reopening plan returned the remaining post-primary students (grades 7-10) to class on April 12, 2021, as planned. Along with school reopening, additional prevention measures were reportedly implemented in schools.²⁶
- On April 5, 2021, the national government utilized their public health criteria for reopening to review readiness to reopen other community-based, public settings (e.g., outdoor activities, construction); however, no change in restrictions were implemented at this time.^{27,28}
- Starting April 12, 2021, after all students had returned to in-person learning and based on public health criteria, Ireland began to gradually reopen other community-based settings and businesses on a week-by-week basis (e.g., residents may meet with one other household, residents may travel within 20km of their home, resumption of residential construction).²⁸

Epidemiological context

- On March 1, 2021 (first day of school reopening), the new daily COVID-19 cases per 100,000 were 13.1 per 100,000 population (7-day average).²⁹ On April 12, 2021 (six weeks after school reopening began, and the date schools returned to in-person learning at all levels), the new daily COVID-19 cases had lowered to 8.2 per 100,000 population (7-day average).²⁹ As of April 27, 2021 (most recent available data, and following the reopening of several additional public settings), the new daily COVID-19 cases per 100,000 were 9.2 per 100,000 population (7-day average).²⁹
- On March 1, 2021 (the first day that school reopening began), 6.2% of Ireland's total population had received at least one dose of the COVID-19 vaccine.³⁰ By April 12, 2021 (when schools were fully reopened), 15.4% of Ireland's total population had received at least one dose of the COVID-19 vaccine.³⁰ As of April 27, 2021 (most recent available data), 21% of Ireland's total population had received at least one dose of the COVID-19 vaccine, and 8.3% of the total population had been fully vaccinated against COVID-19.^{30,31}
- On February 15, 2021, an update from the European Centre for Disease Prevention and Control reported that the B.1.1.7 variant was the dominant circulating SARS-CoV-2 strain in Ireland (75% of all COVID-19 cases in the country).³² Between February 26, 2021 and April 10, 2021, 94% of cases sequenced in Ireland were found to be infected with the B.1.1.7 variant.³³ As of April 26, 2021, the B.1.1.7 variant was still the most dominant SARS-CoV-2 strain in Ireland.³⁴

U.S. CDC Strategy to reduce SARS-CoV-2 transmission in schools

The United States (U.S.) Centers for Disease Control and Prevention (CDC) published guidance on safe school reopening and prevention strategies that K–12 school administrators can use to help protect students, teachers, and staff, and slow the spread of COVID-19.³⁵ A core concept of the CDC's phased prevention approach is that K–12 schools should be last to close (after all other community prevention strategies have been employed), and first to open when it is safe to do so.³⁵ Other core concepts include: prioritizing in-person instruction over extracurricular activities, younger students have less risk of in-school transmission and may benefit more from in-person education, families at increased risk of severe illness should be given remote or virtual learning options, and use of cohorting.³⁵

The CDC's essential elements for the safe reopening of schools are: layered prevention strategies to reduce transmission, consideration of community transmission, and phased prevention strategies based on the levels of community transmission. Testing in schools and vaccination of teachers and staff are critical components to protecting students and teachers against COVID-19.³⁵

The CDC recommends that K-12 school administrators work with local public health officials to assess the level of community transmission, using two measures of community burden to determine the level of risk of transmission: total number of new cases per 100,000 persons in the past 7 days (low, 0-9; moderate, 10-49; substantial, 50-99; high, ≥ 100); and percentage of positive tests in the past 7 days (low, $< 5\%$; moderate, 5-7.9%; substantial, 8-9.9%; high, $\geq 10\%$). These two measures should be used to assess the incidence and spread of SARS-CoV-2 in the surrounding community (e.g., county, region), which then determines the type of prevention strategies to be implemented in the schools.³⁵

Regardless of the level of community transmission, the following layered prevention strategies should be used in all schools to ensure the delivery of safe in-person education: universal and correct use of face coverings, physical distancing, hand-washing, cleaning, and contact tracing. In addition to prevention strategies, the CDC guidance highlights that school closures inequitably impacts marginalized children and students. An equitable and successful strategy to return to in-person learning requires the engagement of the entire school community.³⁵

Discussion and Conclusions

Modelling studies from wave one reported that the closure of schools helped to substantially decrease COVID-19 transmission (as measured by a reduction in reproduction number [R]).¹⁰⁻¹² A study from wave one found that reopening schools could increase COVID-19 transmission by 24% (R 1.24, 1.00–1.52) by day 28 after reopening.¹¹ Modelling studies that incorporate data and measures from wave two, found that school closures had a significantly smaller effect on COVID-19 transmission, when compared with other community-based measures.^{13,14} One study suggested that school closures were not the most effective method for controlling the spread of COVID-19, and that efforts should instead focus on widespread reduction of community transmission.¹⁴ None of the reviewed studies modelled the effect of school closures and reopening in the context of VOC. The closure of educational institutions is thus expected to contribute to some reduction in R, but represents an intervention resulting in significant harms to children and families. Using a first-to-open and last-to-close approach aims to mitigate the harms until a point where transmission needs to be reduced urgently.

Although approximately 10% of COVID-19 cases reported in Ontario from August 30 to March 13, 2021 were among school-aged children (aged 4-17), there was an increase in the rate of COVID-19 observed in school-aged cases in children and youth (as well as an increase in those aged 18 years and older) from mid-February to mid-March 2021. The increases occurred during a time when all schools in the province had re-opened for in-person learning, with concurrent relaxation of public health measures in other sectors in some regions, despite concerns about increasing VOC prevalence. School-aged children within the most racialized neighbourhoods in Ontario had rates of COVID-19 that were approximately 4.1 times higher than rates among school-aged cases in the least racialized neighbourhoods. During this period of increased community incidence, there was also an increase in the number of reported school outbreaks over time. In addition, the number of school-associated outbreaks as well as size of outbreaks with at least one case of a VOC-associated mutation or VOC lineage had begun to increase over time with a significant difference found in the median number of cases per outbreaks with or without a VOC-associated mutation or confirmed VOC detected.¹⁵

The U.S. CDC reinforces the approach of first-to-open and last-to-close in its guidance. This approach states that K–12 schools should be last to close (after all other community prevention strategies have been employed), and first to open when safe to do so, and prioritizing school reopening over non-essential businesses and activities.³⁵ The CDC describes essential elements for the safe reopening of school settings and also notes that in-school testing and the vaccination of teachers and staff are critical components to protecting students and teachers against COVID-19.³⁵ The level of transmission noted by the CDC as ‘substantial’ corresponds with a threshold of more than 50 new cases per 100,000 persons in the past 7 days. Ontario epidemiological data confirms that increasing cases in schools corresponds with increasing community incidence, highlighting the importance of achieving lower levels of community transmission as a facilitator to opening schools.³⁶

The reopening plans in England and Ireland provide examples of jurisdictions that prioritized schools as the first-to-open after strict, long duration lockdowns in the VOC context. Further, both jurisdictions started reopening after achieving control of their epidemics through lower community transmission (England 58.5 cases per 100,000 weekly 7-day average; Ireland 13.1 cases per 100,000 daily 7-day average). Both jurisdictions reopened schools as a first phase (for an extended period) before relaxing any other community-based restrictions, and considered levels of community transmission in their decision-making criteria for reopening.^{8,9,17,18} During the reopening of schools, Ireland and England managed to maintain and even continue decreases in community transmission, and avoid surges in the rate of COVID-19 cases. The vaccine rollout progressed in both jurisdictions during the period of school reopening; however, Ireland was able to resume school attendance and achieve and maintain low community transmission in the context of relatively low initial vaccination coverage.

The examination of differences in the effectiveness of classroom and school-specific public health and prevention measures were out of scope for this evidence brief. However, the prevention strategies implemented in England and Ireland are examples of the prevention measures that are key components of the CDC's guidance to safe school reopening,³⁵ and are supported by recent evidence from the National Collaborating Centre for Methods and Tools (NCCMT).³⁷ Infection control precautions in schools are supported by evidence from a living rapid review from the NCCMT, which found that the risk of COVID-19 transmission from child-to-child, and child-to-adult is low in daycares and primary schools where infection prevention and control measures are implemented and adhered to; outbreaks tend to involve more adult-to-adult transmission than adult-to-child or child-to-adult transmission; and outbreaks have been associated with daycare and school settings in which infection control measures were not in place.³⁷

There are known negative impacts of community-based public health measures (e.g., stay-at-home orders, school closures), on the health and mental health of children and families.^{4,5} It is important to understand how communities are coping with the effects of the public health measures. Remote or online learning inequitably impacts marginalized children and students. An equitable and successful strategy to return to in-person learning requires the engagement of the entire school community and further benefit from societal commitment to prioritize the health and wellbeing of children, which will require consideration for children remaining unvaccinated for some time.³⁵

Implications for Practice

- The risk of outbreaks in school settings increases as incidence in the community increases. In order to reduce the likelihood of cases and outbreaks in schools, it is critical to reduce community transmission to support the reopening of schools and to keep transmission low in order for schools to remain open. Low community transmission also allows sufficient public health capacity to respond to cases and outbreaks in schools in a timely manner, further preventing spread in schools.
- Increasingly stringent measures in non-educational settings (e.g., enhanced closure of non-essential business, curfew) would be important to consider implementing in the context of achieving community transmission rates supportive of educational settings reopening. This is particularly necessary for maintaining ongoing improvement in epidemiological indicators (case rate, R) given the risk of increased epidemic growth with reopening educational settings.
- A schools-first-to-open approach was operationalized successfully in the VOC context in England and Ireland, where schools opened prior to any other setting reopening for 5 and 6 weeks, respectively. After wave 2 in Ontario, when less than this timeframe was used, community transmission increased. Based on this experience, any regional (sub-provincial)-based reopening of schools should support all schools in the province be opened prior to any other setting, with a cautious provincial period of monitoring for school reopening impact, similar to England and Ireland. In the context of VOC and health system capacity in Ontario in spring 2021, it is crucial to maintain the integrity and effectiveness of public health measures, avoid resurgence and equitably apply the schools-first-to-open approach.
- Achieving identified epidemiological thresholds and trends, and health system indicators for healthcare and public health capacity are necessary conditions for beginning reopening, including school reopening. While Ireland was able to mitigate increases in community transmission during the return to school even in the context of very low vaccine coverage in their population when school reopening began (6% of the population had received one dose of a COVID-19 vaccine as of March 1, 2021), they also returned students to school very gradually, at very low rates of community transmission, and all non-school sectors remained in lockdown during the entire six week school reopening period.

- Prior to school reopening, England had a robust system for continuing in-person education for vulnerable students to address and prevent the inequitable distribution of harms associated with loss of in-person education. Assessing needs and enhancing education, mental health and other (e.g., nutrition program) supports for vulnerable students is critical for any prolonged period of remote learning.
- There are known negative and inequitable impacts of community-based public health measures (e.g., stay-at-home orders, school closures), on the health and mental health of children and families. It is important to understand how communities are coping with the effects of the public health measures. This can serve to inform planning of mitigation strategies and approaches to the implementation and/or prioritization of public health measures, in relation to unintended consequences for children and families.

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Appendix A: Ontario epidemiological data sources and caveats

- The data for the Ontario epidemiological context were based on information successfully extracted from the Public Health Case and Contact Management Solution (CCM) for all PHUs by PHO as of **March 30, 2021 at 1 p.m.** CCM is a dynamic disease reporting system, which allows ongoing updates to data previously entered. As a result, data extracted from CCM represent a snapshot at the time of extraction and may differ from previous or subsequent reports. Analyses specific to the number of school outbreaks associated with VOCs were successfully extracted from CCM for all PHUs by PHO as of **April 23, 2021 at 1 p.m.**
- Ontario population projection data for 2020 were sourced from Ministry, IntelliHEALTH Ontario. Data were extracted on November 26, 2019.
- Statistics Canada Postal Code Conversion File (PCCF), reference date of May 2020.
- School outbreaks are defined as two or more lab-confirmed COVID-19 cases in students and/or staff (or other visitors) in a school with an epidemiological link, within a 14-day period, where at least one case could have reasonably acquired their infection in the school (including transportation and before/after school care). Examples of reasonably having acquired infection in school include: No obvious source of infection outside of the school setting; OR Known exposure in the school setting. Only confirmed outbreaks are included in this report. All school outbreaks reported as confirmed in CCM were included in these analyses regardless of whether the case data in CCM supported the outbreaks' classification. Some confirmed outbreaks presented in this report may have fewer than two cases recorded in CCM at the time of writing.
- The data only represent cases reported to public health units and recorded in CCM. As a result, all counts will be subject to varying degrees of underreporting due to a variety of factors, such as disease awareness and medical care seeking behaviours, which may depend on severity of illness, clinical practice, changes in laboratory testing, and reporting behaviours.
- Due to reporting delays and potential variations in data entry processes across public health units, there may be additional school outbreak associated COVID-19 cases that have not yet been entered in CCM, or have not been entered as linked to a school outbreak.
- Differences in testing related to the identification of a VOC case associated with the outbreak are not possible to compare.
- Only cases meeting the confirmed case classification as listed in the MOH Case Definition – Coronavirus Disease (COVID-19) document are included in the report counts from CCM.
- 'Cases associated with school outbreaks' includes cases reported in CCM between August 30, 2020 to March 13, 2021 that are linked to an outbreak, by school classification type (Elementary, Elementary/Secondary, Secondary), that met the definition of a school outbreak. This includes cases that may not have their likely source of acquisition reported as 'outbreak-associated'. School classification types are defined by the Ministry of Education. Some schools classified as secondary may also have an intermediate school in the same location that start in Grade 7. Elementary/Secondary schools include a public or private school educating children in a combination of elementary (Kindergarten to Grade 8) and secondary (Grade 9 to 12) grades (e.g., K-12 combined).

- Public Health Ontario conducts testing and genomic analyses for SARS-CoV-2 positive specimens using the criteria outlined here: <https://www.publichealthontario.ca/en/laboratory-services/test-information-index/covid-19-voc>. Changes to the VOC testing algorithm may occur over time and trends should be interpreted with caution. Since February 3, 2021 all PCR positive SARS-CoV-2 specimens with CT values ≤ 35 are tested for a N501Y mutation. Starting March 22, 2021, these specimens are tested for the E484K mutation as well. Specimens that are positive for the N501Y mutation only are not being forwarded for further genomic analysis. Specimens that are E484K positive (with or without N501Y) are forwarded for genomic analysis.
- The laboratory detection of a variant of concern is a multi-step process. Samples that test positive for SARS-CoV-2 and have a cycle threshold (Ct) value ≤ 35 can be tested for mutations common to variants of concern. If positive for the mutation of interest these samples may then undergo genomic analyses to identify the VOC. VOC lineages may still be confirmed using genomic analysis despite specific S gene mutation(s) being documented as 'unable to complete' due to poor sequence quality at the genome position.
- Outbreaks were identified with at least one confirmed COVID-19 case with a mutation (N501Y and E484K, N501Y (E484K unknown), E484K (N501Y negative), E484K (N501Y unknown)) or VOC (Lineage B.1.1.7, Lineage B.1.351, Lineage P.1) detected if at least one case was linked to the outbreak and was confirmed as a COVID-19 case with a lineage or mutation reported in the Investigation Subtype field OR were identified as having detected a mutation common to VOCs or lineages using genomic analyses using information from the Laboratory object in CCM.
- VOC testing data are analyzed for cases with a reported date on or after February 07, 2021. VOC testing data are based on CCM information reported within the laboratory object for select Logical Observation Identifiers Names and Codes (LOINC) and supplemented with information from the Investigation Subtype field. A confirmed Case Investigation is assigned a VOC test value (e.g., VOC test detected, VOC test not detected) based on the following hierarchy:
- If multiple laboratory results are identified, a VOC test value is assigned based on the following hierarchy: Detected > Not Detected > Unable to complete. If a laboratory result is 'Not Detected' or 'Unable to complete', but data on the Investigation Subtype field is listed as a lineage or mutation common to a VOC, then the VOC test value is set to 'Detected'. Significance testing for the difference in median outbreak size by VOC status was completed using the Mann-Whitney U test.
- The health equity (neighbourhood-level diversity and deprivation) analyses use data from the 2016 Ontario Marginalization Index and population counts from the 2016 Canada Census:
 - Matheson FI; van Ingen T. 2016 Ontario marginalization index. Toronto, ON: Providence St. Joseph's and St. Michael's Healthcare; 2018. Joint publication with Public Health Ontario.
 - Statistics Canada. Census of Population, 2016: Profile for Canada, Provinces, Territories, Census Divisions, Census Subdivisions and Dissemination Areas. Retrieved from: https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/download-telecharger/comp/GetFile.cfm?Lang=E&FILETYPE=CSV&GEONO=044_ONTARIO.
- ON-Marg is a data tool that combines a wide range of demographic indicators into multiple distinct dimensions of marginalization. It is an area-based index which assigns a measure of marginalization based on neighbourhood versus individual characteristics. As such, the broader demographic trends of an area may not reflect all residents of a neighbourhood owing to the inherent heterogeneity of demographic characteristics which can vary substantially especially across large rural geographies. For more information, please visit PHO's ON-Marg website.

- ON-Marg assigns levels of marginalization to census dissemination areas (DAs). Cases were assigned DAs based on postal code of residence using the single-link indicator (SLI) version of the postal code conversion file (PCCF).
- Rates per 100,000 were calculated using population denominators of 4 to 17 year olds in Ontario derived from the 2016 census data.
- Due to data suppression for some census indicators on Indian Reserves in Ontario, residents of Indian Reserves could not be included in ON-Marg and therefore people who have tested positive for COVID-19 and are living on Indian Reserves could not be assigned to a quintile of marginalization. While Indigenous individuals living off reserves are included in this analysis, Indigeneity data is not currently collected or captured in dimensions of ON-Marg.
- The scatterplot provided in **Appendix B** shows the relationship between incidence per 100,000 at the public health unit level and school outbreaks in two time periods (see **Table 1**). This analysis should be considered as preliminary, given not enough time has passed to allow for lags in data entry and outbreak reporting. The data for this specific analysis were based on information successfully extracted from CCM for all PHUs by PHO as of **April 8, 2021 at 1 p.m.**
 - Period 1: Regional incidence of COVID-19 was calculated as the number of confirmed COVID-19 cases reported between August 30, 2020 and December 19, 2020 by public health unit, divided by the population of the corresponding public health unit, and multiplied by 100,000. The final day of school in the province was December 18, 2020. Regional number of school outbreaks was calculated as the number of school outbreaks reported within public health units from August 30, 2020 to January 2, 2021. Outbreaks that were reported following school closure were included due to delays in identification and reporting of outbreaks.
 - Period 2: Regional incidence of COVID-19 was calculated as the number of confirmed COVID-19 cases reported between the first day of in-person schooling, specific to each PHU (2021) to April 3, 2021 (for all PHUs except Thunder Bay and Sudbury who closed February 28 and March 14, 2021, respectively) by public health unit, divided by the population of the corresponding public health unit, and multiplied by 100,000. Regional number of school outbreaks was calculated as the number of school outbreaks reported within public health units from their 2021 school start date to April 3, 2021. Lags in time following school closure were not incorporated into this analysis.
 - Negative binomial regression analysis was used to measure the association between the number of regional school-related outbreaks and regional COVID-19 incidence, to estimate the unadjusted incidence rate ratio (IRR). The IRR estimates the average change in the number of regional school outbreaks associated with an increase of 10 cases per 100,000 in a public health unit.

Appendix B: Summary of select modelling evidence

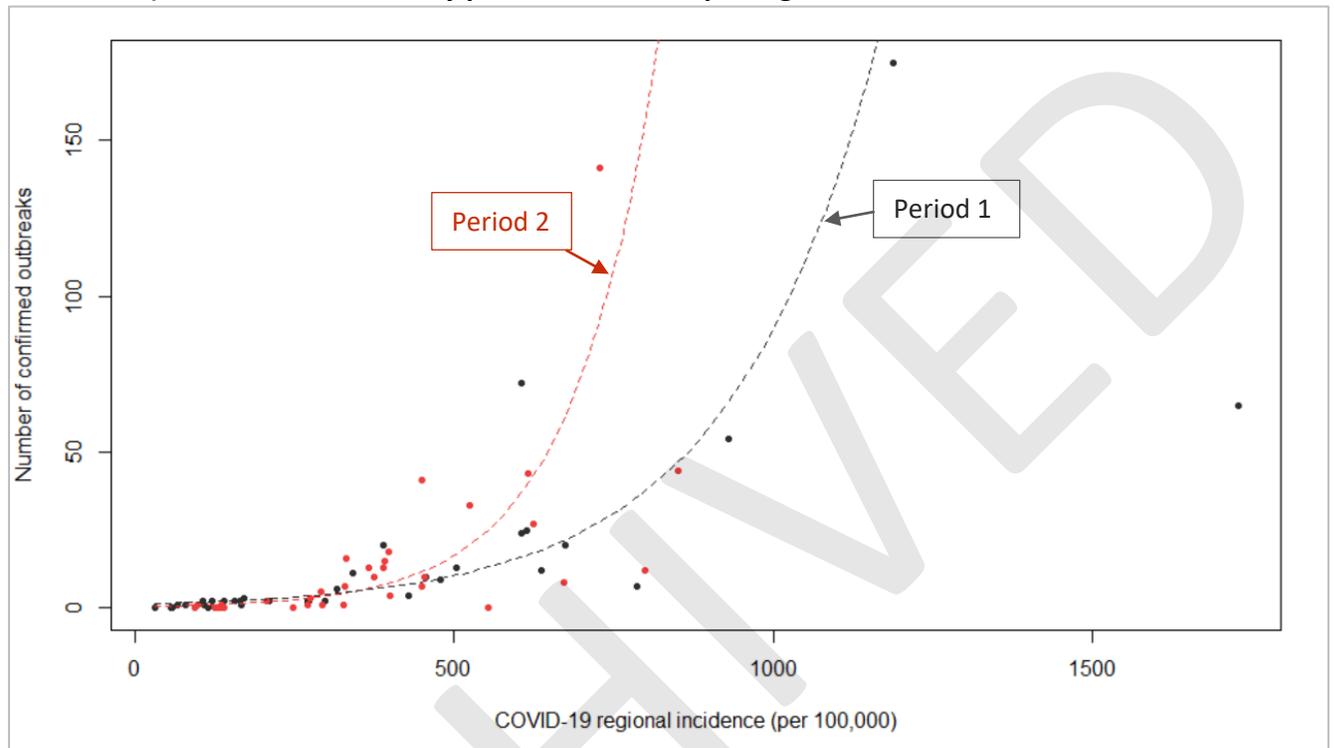
- **Haug et al. (2020)** quantified the impact of public health measures implemented in March-April 2020 in 79 jurisdictions on the effective reproduction number (R_t).¹² The most effective public health measures in mitigating the spread of SARS-CoV-2 were: curfews, lockdowns, and the closing and restricting of places where people gather for an extended period of time, including the closure of shops and restaurants, limits on social gatherings, mandatory work from home, and the closure of educational institutions. The largest observed reduction in R_t were shown by small gathering cancellations (ΔR_t -0.22 to -0.35), **the closure of educational institutions (ΔR_t -0.15 to -0.21)**, border restrictions (ΔR_t -0.057 and -0.23), individual movement restrictions (ΔR_t -0.08 to -0.13), and national lockdowns and regional stay-at-home orders (ΔR_t -0.008 to -0.14).
- **Li et al. (2021)** modelled the association between introducing and lifting NPIs with the level of SARS-CoV-2 transmission (measured using R), using country-level estimates of R and data on country-specific policies implemented January to July 2020 in 131 countries.¹¹ Following the reopening of schools, lifting bans on public events, lifting bans on public gatherings of more than ten people, lifting requirements to stay at home, and lifting internal movement limits increases in R of 11–25% were observed on day 28 after the relaxation. **Closing schools alone could decrease transmission by 15% (R 0.85, 95% CI 0.66–1.10) on day 28, and reopening schools could increase transmission by 24% (R 1.24, 1.00–1.52) on day 28.** The lifting of bans on gatherings of more than ten people which could increase transmission by 25%, which was the highest increase observed among all NPIs.
- **Brauner et al. (2021)** assessed the effectiveness of NPIs implemented in European and non-European countries between January and May 2020.¹⁰ Closing both schools and universities in conjunction resulted in a 38% reduction in R (95% CI: 16 to 54%). By comparison, stay-at-home orders reduced R by 13% (-0.5 to 31%), closing high-risk face-to-face businesses reduced R by 18% (-8 to 40%), closing most nonessential face-to-face businesses reduced R by 27% (-3 to 49%), limiting gatherings to 10 people reduced R by 42% (17 to 60%). Most countries implemented NPIs on the same day or in close succession, therefore schools and universities are reported together.
- **Sharma et al. (2021)** assessed the effectiveness of NPIs implemented in regions of Austria, Czech Republic, England, Germany, Italy, Netherlands and Switzerland from August 2020 to early January 2021.¹³ Despite jurisdictions implementing NPIs concurrently or in grouped tiers, authors were able to disentangle the individual effects of 17 NPIs, for which they estimated intervention effect sizes expressed these as a percentage reduction in the R_t . **The effect of school closures was a 7% reduction in R_t [95% CI: 4-10%].** For comparison, the closure of non-essential business reduced R_t by 35% [95% CI: 29-41%], a ban on gatherings (public and private) reduced R_t by 26% [95% CI: 18-32%], stricter mask wearing policies reduced R_t by 12% [95% CI: 7-17%], and nighttime curfews reduced R_t by 13% [95% CI: 6-20%]. The effect of school closures may have been minimized by countries who reopened schools in tandem with other prevention measures including asymptomatic and symptomatic screening and testing, contact tracing, ventilation, and distancing.
- **Naimark et al. (2021)** estimated the association between schools being open or closed and the number of COVID-19 cases, compared with the number of cases associated with other community-based NPIs.¹⁴ This modelling used a synthetic population of 1,000,000 individuals based on population characteristics of Ontario. **The study found that the estimated effect of opening schools on COVID-19 cases was substantially lower than the effect of community-based NPIs.** Across the modelled scenarios, **less than 5% of COVID-19 infections among**

students and teachers were acquired within schools. School reopening without the implementation of other community-based NPIs was associated with 493 (95% CI: 435-569) school-acquired infections, and 15,892 (95% CI 14,837-16,679) infections acquired in the community. School reopening alongside the implementation of other community-based NPIs was associated with 167 (95% CI: 145-203) infections acquired in school, and 9,643 (95%CI: 9,008-10,415) infections acquired in the community.

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Appendix C: Relationship between regional incidence and school outbreaks in Ontario

Figure 1: Number of confirmed outbreaks declared in schools by COVID-19 regional (i.e. public health unit) incidence: Ontario, by period of school opening



Data Source: CCM

Note: Regional incidence was calculated at the public health unit level for two separate periods of time to align when schools were open in the Fall 2020 and Winter 2021 period. Period 1 included cases reported from August 30 to December 19, 2020. Outbreaks include those reported between August 30, 2020 and January 2, 2021, to allow for the capture of outbreaks identified at the end of the school semester. Period 2 included cases and outbreaks reported from five different starting dates, depending on when schools opened in each PHU (i.e., January 11, January 25, February 1, February 8 or February 16, 2021) until April 3, 2021 (with the exception of Thunder Bay and Sudbury who closed February 28 and March 14, 2021, respectively).

The trend line demonstrates the association between the cumulative incidence of COVID-19 per 100,000 and the number of confirmed school outbreaks within a public health unit over the time period. Specific dates for Period 2 are provided in **Table 1**.

- Period 1 (August 30, 2020 – January 2, 2021): For every increase of 10 cases per 100,000 in regional incidence, the estimated number of regional school outbreaks increases by 4% (Incident Rate Ratio=1.04 [95% Confidence Interval 1.03-1.06]).
- Period 2 (varying start dates, 2021 – varying end dates, 2021): For every increase of 10 cases per 100,000 in regional incidence, the estimated number of regional school outbreaks increases by 8% (Incident Rate Ratio=1.08 [95% Confidence Interval 1.05-1.11]).

Table 1. Start and end dates for Period 2 case incidence and school outbreaks, by PHU

Public Health Unit	Period 2 Start date	Period 2 end date
Algoma Public Health	January 11, 2021	April 3, 2021
North Bay Parry Sound District Health Unit	January 11, 2021	April 3, 2021
Northwestern Health Unit	January 11, 2021	April 3, 2021
Porcupine Health Unit	January 11, 2021	April 3, 2021
Public Health Sudbury & Districts	January 11, 2021	March 14, 2021
Thunder Bay District Health Unit	January 11, 2021	February 28, 2021
Timiskaming Health Unit	January 11, 2021	April 3, 2021
Grey Bruce Health Unit	January 25, 2021	April 3, 2021
Haliburton, Kawartha, Pine Ridge District Health Unit	January 25, 2021	April 3, 2021
Hastings Prince Edward Public Health	January 25, 2021	April 3, 2021
Kingston, Frontenac and Lennox & Addington Public Health	January 25, 2021	April 3, 2021
Leeds, Grenville & Lanark District Health Unit	January 25, 2021	April 3, 2021
Peterborough Public Health	January 25, 2021	April 3, 2021
Renfrew County and District Health Unit	January 25, 2021	April 3, 2021
Ottawa Public Health	February 1, 2021	April 3, 2021
Eastern Ontario Health Unit	February 1, 2021	April 3, 2021
Middlesex-London Health Unit	February 1, 2021	April 3, 2021
Southwestern Public Health	February 1, 2021	April 3, 2021
Brant County Health Unit	February 8, 2021	April 3, 2021
Chatham-Kent Public Health	February 8, 2021	April 3, 2021
City of Hamilton Public Health Services	February 8, 2021	April 3, 2021
Durham Region Health Department	February 8, 2021	April 3, 2021
Haldimand-Norfolk Health Unit	February 8, 2021	April 3, 2021

Public Health Unit	Period 2 Start date	Period 2 end date
Halton Region Public Health	February 8, 2021	April 3, 2021
Huron Perth Public Health	February 8, 2021	April 3, 2021
Lambton Public Health	February 8, 2021	April 3, 2021
Niagara Region Public Health	February 8, 2021	April 3, 2021
Simcoe Muskoka District Health Unit	February 8, 2021	April 3, 2021
Region of Waterloo Public Health and Emergency Services	February 8, 2021	April 3, 2021
Wellington-Dufferin-Guelph Public Health	February 8, 2021	April 3, 2021
Windsor-Essex County Health Unit	February 8, 2021	April 3, 2021
Peel Public Health	February 16, 2021	April 3, 2021
Toronto Public Health	February 16, 2021	April 3, 2021
York Region Public Health	February 16, 2021	April 3, 2021

Appendix D: Status of reopening plans in England and Ireland

The tables below describe the approaches to and status of the relaxation of lockdown measures in England (**Table 2**) and Ireland (**Table 3**).

Table 2. Status of England’s reopening plan

Roadmap to reopening step	Reopening plan ^{8,9}	Status of reopening
<p>Step 1 1A. March 8, 2021 (9 weeks after lockdown) 1B. March 29, 2021 (12 weeks after lockdown)</p>	<p>Starting March 8, 2021 (Step 1A)</p> <ul style="list-style-type: none"> • Schools open and outdoor after-school sports allowed • All schools and college students back in class • Mandatory face masks for secondary school students • Some university students return • Two people can sit together outdoors • Care home residents are allowed one regular visitor <p>Starting March 29, 2021 (Step 2B)</p> <ul style="list-style-type: none"> • Six people or two households are allowed to meet outdoors • Outdoor sports facilities open and organized sports are allowed • Travel outside the local area is allowed • The ‘stay at home’ order is replaced with a ‘stay local’ message • Workers are still encouraged to work from home 	<p>March 8, 2021 (Step 1A)^{17,18}</p> <ul style="list-style-type: none"> • Students of all schools (roughly a primary to grade 10 equivalent in Canada) and college (roughly a high school equivalent in Canada) returned to in-person learning. • Testing was provided for all secondary school students (roughly grade 6 to end of high school in Canada) and higher education (equivalent to post-secondary education in Canada), but was not a requirement to be allowed to return. Face masks should be worn by everyone in schools and colleges where students in year 7 (roughly grade 6) and above are educated. Return of students to university in programs that must be delivered in person or who are studying practical or practice-based (e.g., creative arts) programs. • Two people can sit together outdoors (one-plus-one rule), and care home residents are allowed one regular visitor indoors.³⁸ <p>March 29, 2021 (Step 1B)²⁰</p> <ul style="list-style-type: none"> • People permitted to meet in groups of six people (or two households) outdoors, and outdoor organized sports and outdoor facilities were open and allowed. • Travel was recommended to be minimized but allowed to and from England within the United Kingdom. It was noted

Roadmap to reopening step	Reopening plan ^{8,9}	Status of reopening
		<p>that some areas of the United Kingdom may have a requirement to 'stay at home' or 'stay local'.</p> <ul style="list-style-type: none"> Workers are still encouraged to work from home.
<p>Step 2 April 12, 2021 (14 weeks after lockdown)</p>	<p>Starting April 12, 2021</p> <ul style="list-style-type: none"> Non-essential retail and personal care opens Hospitality outdoors opens (e.g., pubs and restaurants with outdoor seated service) Indoor leisure opens (e.g., gyms, swimming pools) Self-contained holiday locations open (e.g., campsites) Funerals continue with up to 30 people; weddings with up to 15 guests Wider social distancing rules remain in place for public settings International holidays not permitted 	<p>From April 12, 2021 the following settings can reopen:²⁰</p> <ul style="list-style-type: none"> Non-essential retail Personal care services Libraries and community centres Outdoor hospitality with table service only Most outdoor attractions such as zoos, theme parks, drive-in Smaller outdoor events such as fetes, literary fairs Indoor leisure and sport facilities for individual exercise or exercise with your household All childcare and supervised activities allowed indoors and outdoors for children. Parent and children groups can take place indoors up to 15 people. Self-contained holiday locations open (e.g., campsites) Weddings, civil partnership ceremonies, wakes and other commemorative events can take place for up to 15 people, including in indoor venues that are permitted to open or where an exemption applies care home residents will be able to nominate two named individuals for regular indoor visits (following a rapid lateral flow test) Continue to work from home if you can and minimize the amount that you travel where possible
<p>Step 3 May 17, 2021 (19 weeks</p>	<p>Starting May 17, 2021</p> <ul style="list-style-type: none"> Outdoors, most social contact rules lifted (e.g., rule of six outdoors lifted) 	<p>N/A</p>

Roadmap to reopening step	Reopening plan ^{8,9}	Status of reopening
after lockdown)	<ul style="list-style-type: none"> • Up to 10,000 or 25% capacity (whichever is less) spectators can attend the very largest (i.e., 16,000 people or more) outdoor seated venues like football stadiums • Smaller outdoor sport venues are allowed with 4,000 fans or 50% capacity (whichever is less) • Six people or two households can meet indoors • Indoor hospitality and hotels open • Up to 30 people will be able to attend weddings, receptions, funerals and wakes • Possible return of international travel 	
Step 4 June 21, 2021 (24 weeks after lockdown)	<p>Before implementing Step 4, ministers will review social distancing and other long-term measures designed to reduce transmission, including the "one metre plus" rule and wearing of face coverings. They will also consider whether to lift the "work from home" guidance, which the government says people should continue to follow until the review has been completed.</p> <p>Starting June 21, 2021 (24 weeks after lockdown)</p> <ul style="list-style-type: none"> • All legal limits on social contact removed • Hope to reopen final closed sectors of the economy (e.g., nightclubs, hospitality) • Large events and performances can restart with full audience 	N/A

Table 3. Status of Ireland's reopening plan

Date	Description ⁶	Status of Reopening
<p>March 1, 2021 (10 weeks after lockdown)</p>	<p>Special schools at 100% capacity.⁶</p> <p>Primary school junior and senior infants, 1st and 2nd classes return to school (approximate ages 4 to 7).^{6,39}</p> <p>Post-primary school 6th classes return to school (approximate ages 17 to 18).^{6,40}</p>	<p>On March 1, 2021, special schools and children from junior infants to 2nd class returned to classrooms as planned.⁴¹</p> <p>Primary and special school precautions: students to keep physical distance outside of classrooms, and work in classrooms in designated “bubbles”; increased hand washing and sanitizing; enhanced cleaning regimes; staggered breaks and lunches; staggered drop off and pick up; face coverings for staff when a distance of two metres cannot be maintained; and one metre space between desks.²⁶</p>
<p>March 8, 2021 (11 weeks after lockdown)</p>	<p>Resumption of the Early Childhood Care and Education (ECCE) programme and return to school of ECCE-age children.⁶ ECCE provides childcare for pre-school children ages 2 years and 8 months up to 5 years and 6 months.⁴²</p>	<p>On March 8, 2021, the ECCE programme reopened as planned.⁴³</p> <p>Childcare service precautions: children grouped in “pods” to limit the number of people in contact with each child. Children and staff are not required to wear masks when interacting or when care is provided, staff do wear masks when interacting with other staff or parents. Drop-off and pick-up are organized to allow distancing between children and parents of different “pods”.²⁰</p>
<p>March 15, 2021 (12 weeks after lockdown)</p>	<p>Primary school 3rd, 4th, 5th and 6th classes return (approximate ages 8 to 11).^{6,39}</p> <p>Post-primary school 5th classes return (approximate ages 16 to 17).^{6,40}</p>	<p>On March 15, 2021, the second stage of school reopening proceeded as planned with children from 3rd to 6th class in primary school and 5th year students in post-primary level all returning to classes.⁴⁴</p> <p>Post-primary school precautions: student assignment to main class cohort where possible; increased hand washing and sanitizing; enhanced cleaning regimes; staggered breaks and lunches; face coverings for students over age 13 and all staff</p>

Date	Description ⁶	Status of Reopening
		when a distance of two metres cannot be maintained; two metre space between desks. ²⁶
March 29, 2021 (14 weeks after lockdown)	All other early learning and childcare services for all ages reopen. ⁶	On March 29, 2021, childcare services reopened for all children. ⁴³
April 5, 2021 (15 weeks after lockdown)	<p>Starting April 5, 2021, the following easing of restrictions were considered:⁶</p> <ul style="list-style-type: none"> • Easing of restrictions on outdoor activities and meetings beyond one other household. • Consideration of extending the current 5km limit. • Staggered start of easing of other areas of activity with a focus on outdoor activities including sport and some areas of construction. 	N/A; these restrictions were lifted on April 12, 2021. ^{27,28}
April 12, 2021 (16 weeks after lockdown)	Post-primary school 1 st to 4 th classes return to school (approximate ages 12 to 15). ^{6,40}	<p>In-person teaching resumed at all levels.²⁸</p> <p>The following settings also reopened on April 12, 2021:²⁸</p> <ul style="list-style-type: none"> • Residents can meet one other household outside (but not at their residence). • Residents can travel within their county or within 20km of their home if crossing county boundaries. • All residential construction can resume.
April 26, 2021 (18 weeks after lockdown)	<p>On April 26, 2021, the government planned to reopen the following settings:²⁸</p> <ul style="list-style-type: none"> • Outdoor sports facilities (e.g. pitches, golf courses and tennis courts, other facilities as appropriate). • Outdoor visitor attractions (e.g., zoos, open pet farms, heritage sites). • Maximum attendance at funerals will increase to 25. 	<p>The following restrictions were lifted, as planned, on April 26, 2021:⁴⁵</p> <ul style="list-style-type: none"> • Fully vaccinated households can meet one other fully vaccinated household indoors. • Non-contact sports such as golf and tennis can resume, and sports training for those under age 18 is allowed in groups of 15.

Date	Description ⁶	Status of Reopening
		<ul style="list-style-type: none"> • Maximum attendance at funerals increased from 10 to 25 people. • Dance classes permitted outdoors, zoos, wildlife parks and heritage centres can reopen, amusement parks remain closed.
May 4, 2021 (19 weeks after lockdown)	<p>Starting May 4, 2021, the government will consider the following settings to reopen:⁶</p> <ul style="list-style-type: none"> • Full reopening of construction activity • Reopening of museums, galleries and libraries • Phased return of non-essential retail commencing with click-and-collect and outdoor retail (e.g., garden centres/nurseries) • Staggered reopening of personal services and religious services 	<p>N/A</p>

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For more information please contact: EPIR@oahpp.ca

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