SCIENCE BRIEFS

Infection Prevention and Control Considerations for Schools during the 2022-2023 Academic Year

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Key Message

In-person schooling is essential for children and youth for both academic educational attainment and for the development of social, emotional growth and life skills. Schools are a place where children gain essential academic skills, form friendships, learn social and life skills, and are key settings for physical activity. Schools provide critical services that help to mitigate health disparities, including school nutrition programs, public health services (immunizations, dental screening), health care services (speech and language therapy, occupational therapy), social services and mental health supports. Schools should therefore remain open for in-person learning.

Optimizing the health and safety of children and staff in schools requires that certain health and safety measures be in place, irrespective of the COVID-19 pandemic. These "permanent" measures include achieving and maintaining adequate indoor air quality, environmental cleaning and disinfection, hand hygiene, students and staff staying home when sick and up-to-date routine and recommended immunizations for students and staff.

Temporary infection-related health and safety measures (e.g., masking, physical distancing, cohorting, active screening, testing) can help reduce the transmission of communicable illnesses in schools. However, some can pose additional challenges to school operations, student learning and student wellness. Furthermore, some of these measures may adversely impact social connectedness, which is of vital importance for children of all ages and of heightened significance in the adolescent years. Therefore, a thoughtful approach based on real-time local level analysis is recommended before reintroducing these temporary measures after careful consideration of the potential benefits and negative consequences. Given that schools are not isolated from communities, implementation of these temporary measures should not be done in isolation of community measures for indoor spaces. These temporary measures are not expected to be required at the start of the 2022 school year.

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About Us: The Ontario COVID-19 Science Advisory Table is a group of scientific experts and health system leaders who evaluate and report on emerging evidence relevant to the COVID-19 pandemic, to inform Ontario's response. Our mandate is to provide weekly summaries of relevant scientific evidence for the COVID-19 Health Coordination Table of the Province of Ontario, integrating information from existing scientific tables, Ontario's universities and agencies, and the best global evidence. The Science Table summarizes its findings for the Health Coordination Table and the public in Science Briefs.

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The views and findings expressed in this Science Brief are those of the authors and do not necessarily reflect the views of all of the members of the Ontario COVID-19 Science Advisory Table, its Working Groups, and its partners.

Background

The physical, emotional, and developmental health of children and youth have been deeply impacted by the COVID-19 pandemic and the consequent disruptions and inconsistencies in the children's learning and extra-curricular activities.[1] School disruptions, including school closures and education models that reduce direct interaction between children, their peers, and their teachers (e.g., online learning), have exacerbated educational inequities and deprived children of other supports and activities available through schools, including nutrition programs, shared school resources (e.g., computer and science labs), health services, physical activity and sports and clubs and teams. These are examples of essential determinants that contribute to overall health and well-being of children and youth.

Throughout the COVID-19 pandemic, Ontario had the longest school closures for in-person learning compared to other provinces and many North American and European jurisdictions.[2] Moreover, schools in marginalized areas had higher cumulative incidence of student infections.[3] It is therefore essential that the needs of students be prioritized to ensure sustained in-person school attendance, in-person learning, and student engagement, with a particular focus on supports and resources for marginalized communities and vulnerable populations that have been disproportionately impacted by the COVID-19 pandemic.[4] In addition, the degree of disruption to the daily school routine, health services and school-related activities should be minimized, whenever possible. School closures to in-person attendance should be considered as part of a communicable disease control strategy in only the most catastrophic of circumstances.

The goal of this document is to highlight changes to the approach described in the previous Science Table Brief entitled "School Operation for the 2021-2022 Academic Year in the Context of the COVID-19 Pandemic" for the upcoming school year, taking into account current SARS-CoV-2 epidemiology, widespread COVID-19 vaccination uptake and the likely re-emergence of other respiratory and gastrointestinal pathogens. An important consideration moving forward is the recognition that SARS-CoV-2 is likely to continue to circulate indefinitely. Several important domains related to education and children are not covered, including 1) the need for mental health awareness and support for all children, 2) the importance of a strategy to manage the educational losses experienced thus far by children[3] and 3) curricular reforms.

This document was created by an interdisciplinary group of experts in pediatrics, infectious diseases, infection prevention and control (IPAC), education, epidemiology, environmental and occupational health, indoor air quality, public health, school health, psychiatry and mental health, rural health, and Indigenous health. There was broad stakeholder engagement that included children's hospitals in Ontario (The Hospital for Sick Children (SickKids), Children's Hospital of Eastern Ontario (CHEO), McMaster Children's Hospital, Kingston Health Sciences Centre, Holland Bloorview Kids Rehabilitation Hospital, London Health Sciences Centre, and Unity Health Toronto), education administration (school boards, principals), the school community (educators, parents, and students), and members of the Ontario COVID-19 Science Advisory Table.

Given that educators of elementary and secondary school students are best positioned to appreciate the operational and logistical considerations in adapting school and class routines to incorporate health and safety protocols, the following is not intended as an exhaustive school guidance document or implementation strategy. The ongoing safe operation of schools is the primary responsibility of the Ministry of Education and should include input from several key stakeholders, including the Chief Medical Officer of Health, Ministry of Health, Ministry of Labour, public health authorities, teachers and other educators and their representatives, principals, other school-

related authorities, parents, children and youth.

The recommendations in this document were drafted, reviewed, and approved by the authors. While the evidence from the literature was routinely reviewed and used to form the basis of recommendations, several statements are made based on expert opinion with the rationale provided and evidence gaps highlighted. Recommendations may need to be adjusted as new evidence emerges.

Questions

What permanent health and safety measures are recommended to be in place in schools?

What are the temporary health and safety measures and when might they be considered?

What are additional considerations for schools in rural, remote, Indigenous Communities and resource-limited urban communities?

What are additional considerations for children and youth with medical, physical and neuro-developmental needs?

Findings

Permanent Measures

There are several health and safety measures that are recommended to be part of normal operations to reduce the risk of transmission of communicable infections in schools, including SARS-CoV-2 and other respiratory viral infections (e.g., influenza, respiratory syncytial virus (RSV)), and gastrointestinal infections (e.g., norovirus, rotavirus). These include achieving and maintaining adequate indoor air quality, hand hygiene, environmental cleaning and disinfection, students and staff staying home when sick, and up-to-date routine and recommended immunizations for students and staff. While no single intervention alone will eliminate the potential for communicable disease transmission, these permanent measures together will reduce the risk of both respiratory and gastrointestinal infection transmission in schools.

Efforts should be made to ensure equitable distribution of these permanent measures between schools and communities in order to support safe continuity of in-person learning for all children and communities. There should be a particular focus on supports and resources for marginalized communities and vulnerable populations that have been disproportionally impacted by the COVID-19 pandemic.[4]

Achieving and Maintaining Adequate Indoor Air Quality

Achieving adequate indoor air quality through ventilation and filtration in schools is a necessary investment to support health and wellness, academic performance and infection prevention related to SARS-CoV-2 and other respiratory infections.[5] These measures have the potential for broad impact given the use of centralized systems that do not depend on individual behaviours for effectiveness (e.g., masking and distancing requirements). It is recognized that aerosols play a role in the transmission of SARS-CoV-2, especially in poorly ventilated indoor areas.[6–8] As such, it is expected that environmental conditions, exposure time and the air exchange rate in a space influence the transmissibility of SARS-CoV-2 and other respiratory viruses.[9,10] Therefore, adequate ventilation and filtration of classroom environments are important measures to reduce the likelihood of transmission of many communicable illnesses,[8,11,12] but will not eliminate the risk associated with close, prolonged, unprotected contact.

Previous recommendations for achieving and maintaining adequate indoor air quality through ventilation and filtration are reinforced in this document, including:

- A systematic approach to identifying and prioritizing schools for ventilation upgrades should be undertaken. Those schools that do not meet the appropriate minimum ventilation guidelines from The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.1-2019 should be prioritized for upgrades.[13]
- Invest in school heating, ventilation, and air conditioning (HVAC) system infrastructure and regular maintenance. This is of particular importance in schools where the system does not support good indoor air quality. HVAC systems can be optimized for a variety of objectives which may change in priority depending on the context, e.g., COVID-19 pandemic, influenza season, poor outdoor air quality, and extreme cold/heat events.
- Optimize HVAC system function for respiratory particle (e.g., aerosol) removal given the anticipated circulation of multiple respiratory viruses, including SARS-CoV-2 (e.g., use of the highest rated Minimum Efficiency Reporting Value (MERV) filter that can be accommodated by the system, regular inspection of filters assembly, routine replacement of filters).[12,14] In consultation with experts in physical plant design, air exchange rate and outdoor air intake can be increased. The limits of what is possible may be dictated by thermal comfort, humidity, and outdoor air quality.
- Consider increasing ventilation and filtration above the minimum ASHRAE guidelines, where possible, in spaces where more respiratory aerosols are likely to be generated (e.g., music room, auditorium, cafeteria, gymnasium).
- It is important that HVAC and supplemental ventilation/filtration systems are regularly maintained and that measures are checked with the goal of optimization (e.g., air exchange rates, outdoor air intake, temperature, humidity).
- Portable HEPA filters can be an important supplemental measure, particularly in school spaces where other ventilation and filtration are insufficient. To be effective, filters have to be sized appropriately (e.g., have a high enough clean air delivery rate) to reduce indoor respiratory particles and in many spaces, multiple filters will be needed. Noise can be an issue in many cases and can be mitigated with appropriate filter selection and staff education on their use.
- The impact of any indoor air quality measure is going to be strongly dependent on the particular school space and the implementation details. Trained professionals should be involved in measure selection, implementation, and maintenance.

Additional strategies can be used to improve air quality while awaiting HVAC system upgrades. A detailed summary is provided in the section on Achieving and Maintaining Adequate Air Quality through Ventilation and Filtration in the School Operation for the 2021-2022 Academic Year in the Context of the COVID-19 Pandemic.

Environmental Cleaning and Disinfection

Routine environmental cleaning and disinfection is an important measure to reduce the risk of transmission of respiratory and gastrointestinal pathogens from touching contaminated surfaces.[15]

Recommendations for environmental cleaning:

- There should be a regular cleaning schedule, using Health Canada-approved disinfectants ensuring directions are followed (e.g., contact time is observed) with an emphasis on high-touch surfaces.[16]
- Efforts should be made to reduce the need to touch objects/doors (no-touch waste containers, prop doors open when not a fire/safety hazard).

Hand Hygiene

Routine hand hygiene is beneficial for the prevention of many childhood infections that have the potential to disrupt school attendance. Hand-to-face contact is implicated in transmission by the fecal-oral route (e.g., norovirus and other gastrointestinal pathogens) and can contribute to transmission of respiratory viruses including rhinovirus,[17] influenza[18] and beta coronaviruses[19] emphasizing the importance of hand hygiene in schools.[20]

- Children and youth should be taught how to clean their hands properly with soap and water or alcohol-based hand rub (with developmentally and age-appropriate material)[21] and taught to avoid touching their face, eyes, nose and mouth as much as possible. This should be done in a non-judgmental and positive manner and should be reinforced regularly.
- Respiratory etiquette should be described to children, youth, and their guardians. Children and youth should be reminded to sneeze or cough into a tissue or their elbow/sleeve if no tissue is available followed by hand hygiene. Those who have symptoms of a respiratory tract infection (not otherwise explained by underlying conditions) should stay home (see next section).
- Students and staff should perform routine hand hygiene when indicated,[21] including upon entering and before exiting the building, after using the washroom, and before and after eating.
- Access to hand hygiene facilities (hand sanitizer dispensers and sinks/soap) is recommended. Hand sanitizer (60-90% USP grade alcohol, not technical grade alcohol) should be available and easily accessible in all classrooms and throughout the school. Safety precautions to avoid toxic exposure (e.g., ingestion) from hand sanitizers should be in place.

Staff and Students Staying Home When Sick

School staff, students and visitors should stay home when sick both for their own health and to reduce the spread of communicable diseases in schools. There should be clear guidance about what signs and symptoms require school exclusion and the timing for return to school. Over the course of the COVID-19 pandemic, there has been a fundamental shift across all sectors in destigmatizing absenteeism for illness that should continue beyond the pandemic. There should be policies in place for staff so that they are supported to stay home without fear of loss of pay, employment or other negative impacts.

For students, it is recognized that school attendance is a critical factor that contributes to improved educational and health outcomes[22–24] and that extreme absenteeism increased considerably during the pandemic.[25] In developing strategies and supports for improved school attendance, schools should avoid programs that incentivise students to go to school when sick. Equitable supports should be in place to allow for learning from home when needed. Availability of paid sick days for parents is an important initiative to ensure that families can follow public health guidance on school exclusion for various communicable illnesses.[26]

Vaccination

Immunization is widely recognized as one of the most effective interventions for reducing the impact of communicable diseases. Unfortunately, the COVID-19 pandemic and consequent limitations on availability of in-person health services and immunization programs, particularly in school settings, have led to a significant reduction in pediatric immunization rates across Ontario.[27–29] As preparations are made for the upcoming school year, collaboration between schools, public health

units and primary care providers will be important towards ensuring that routine childhood vaccines are easily accessible and encouraged for all approved age groups, and offered as a permanent community-based measure for all eligible individuals against vaccine-preventable illnesses.

Recommendations for vaccination:

- Strongly encourage updating routine childhood immunizations prior to school re-entry. Under the Ontario Immunization of School Pupils Act (ISPA), all students attending primary or secondary school are required to provide proof of immunization against nine vaccine-preventable infectious diseases, including diphtheria, tetanus, pertussis (whooping cough), poliomyelitis, measles, mumps, rubella, meningococcal disease, and varicella (chickenpox, for those born on/after 2010), or provide the required documentation for a medical or non-medical exemption to immunization.[30]
- Recommend influenza vaccination and COVID-19 vaccination for all eligible individuals.
- Initiate robust vaccine campaigns to reduce barriers to access and improve vaccine confidence.
- Ensure culturally appropriate messaging in partnership with individual communities and their leaders, including Indigenous and other racialized populations, taking into consideration historical factors contributing to vaccine hesitancy and medical mistrust.
- Promote vaccine distribution plans that are focused on ease and equity of access (e.g., on-site school-based vaccine clinics for students and their families), education and youth ambassador engagement to optimize vaccine coverage rates. These strategies should be implemented prior to the beginning of the school year and offered throughout the year, especially among communities with low student vaccine coverage.

Temporary Measures

During the 2020-2021 and 2021-2022 school years, temporary mitigation measures, including active symptom screening, non-medical and medical mask use, cohorting, physical distancing and testing, were put in place in order to reduce the spread of SARS-CoV-2 in schools. These interventions can also reduce the spread of other communicable diseases in schools, but may disrupt school operations to varying degrees, and may adversely impact student learning and reduce healthy social connectedness, which is of vital importance for children of all ages and of heightened significance in the adolescent years. With broad uptake of COVID-19 vaccines and increasing natural immunity and the significant reduction in disease severity they have afforded, it is anticipated that these measures will not be required at the start of the 2022-2023 school year.

Considerations of when and how to modify temporary measures in schools and which measures to implement should be informed by continuous monitoring of evolving epidemiology of the communicable illness and their health system impacts. Situations when temporary measures may be considered can occur at the school level (e.g., major outbreaks with significant staff or student absenteeism), regionally (e.g., resource-limited urban communities) or provincially (e.g., health system capacity constraints). Decisions should evaluate the benefits and harms of the measures and should be made in collaboration with the local public health unit, Ministry of Health and Ministry of Education. Implementation of these temporary measures in schools should not be done in isolation of community measures. In particular, mask mandates should align with community guidance for indoor spaces.

Active Screening

The purpose of continuing or reintroducing active screening (e.g., requiring that symptom screening be completed and reviewed) would be to heighten awareness of signs and symptoms of a communicable illness and to increase accountability for individuals to stay home when sick or experiencing infectious symptoms. Daily symptom screening was associated with risk reduction of SARS-CoV-2 infection (assuming the symptomatic individuals stayed home)[31] and may be an effective strategy for the prevention of other infectious disease transmission within schools (e.g., influenza, RSV, norovirus). The need for confirmation of screening, the location of screening (home vs. school) and the exact screening/exclusion criteria (e.g., number of symptoms, duration of symptoms, presence of symptomatic household members, recent exposure), will depend on the local epidemiology of the communicable disease.

Masking

A full review of the evidence on mask-wearing in children and COVID-19 has been recently summarized.[32] Of note, studies have shown that schools with mask mandates, along with other health and safety measures, have been associated with a lower incidence of SARS-CoV-2 infection compared to schools without mask mandates. This supports that masking along with other measures may reduce transmission within schools, but the isolated effect of masking is difficult to determine. In terms of potential negative consequences of mask-wearing, the review found no objective evidence for reduced respiratory function in children wearing masks, although subjective complaints were reported. There was no evidence of negative cognitive impacts and there were varying results for studies on the psychological, communicative and dermatologic impacts of child mask-wearing. Consequently, it will be prudent to continue to evaluate and assess the impact of mask-wearing so as to be able to make strong, evidence-informed decisions based on risks versus benefits going forward.

Based on the currently available evidence, there was a lack of consensus among coauthors as to if and when masking should be mandated. Operationally, mask-wearing is likely the easiest temporary measure to implement if required to support ongoing school operations. The use of non-medical or medical mask mandates should align with community guidance for indoor spaces and high-quality, well-fitted masks should be available to students and staff. It is recognized that some school staff and students may continue to wear a mask even in the absence of a mandate, and this choice should be respected; schools should be mask-friendly environments.

Cohorting

The potential benefit of cohorting is that it can reduce the number of students and staff who come into close contact with each other and therefore reduce the number of exposures to communicable infections. While cohorting reflects the natural state of in-school instruction among kindergarten and elementary school-aged children, once they leave school, they frequently mix with siblings, friends, care groups, and children from other community activities. Moreover, cohorting outside of the classroom (e.g., recess, playgrounds) requires additional physical and human resources that may not be readily available. As such, introduction of cohorting requires careful thought and is likely only warranted if there is a major surge in communicable illness with significant health impacts to children in this age group.

Cohorting in high schools is challenging, often requiring the use of adaptive learning models (e.g., quadmester or octomester schedules, blended learning with reduced in-person instruction, hybrid learning, reduced specialized academic instruction/ single teacher instruction), which are not optimal for learning, development, or social interactions[33,34] and require lead time for scheduling /timetabling. As such, this strategy should generally not be used for this age group save for major surges of

communicable illnesses that have a significant impact on the health of this age group.

Physical Distancing

Physical distancing can be a useful temporary measure for communicable illnesses where transmission most commonly occurs with close, unprotected contact. Among younger children, recognizing that social interaction is central to child development and should be encouraged, cohorting and masking are strategies that should be prioritized over physical distancing to allow for interactions.[35] For older students, masking and distancing are preferred strategies to cohorting because of the latter's adverse impact on schooling, social interactions, sports and extra-curricular activities. Modifications to physical distancing recommendations can be accomplished practically during the school year by the type of interactive work. However, significant limitations to group/interactive work are generally not recommended, as groups are an integral component of teaching, learning, and social development, and other effective temporary measures can be layered in to reduce the risk of spread in the classroom.

Testing

If a testing strategy is implemented to detect and limit transmission of communicable disease, efforts should be made to promote use of the program by students and school staff, including but not limited to, providing options for less invasive and better-tolerated specimen collection (if available), increasing accessibility through pop-up clinics or on-site testing opportunities (e.g., in school settings), offering flexible hours of operation, as well as consideration for take-home testing kits for students, staff and families with self-drop-off locations and hours.

Special Considerations for Schools in Rural, Remote, Indigenous Communities and Resource-Limited Urban Communities?

For students in rural, remote, Indigenous communities and resource-limited urban communities, the COVID-19 pandemic has presented additional distinctive and substantial challenges for education delivery. It is essential to take the lead from local communities to determine strategies to support ongoing health, mental health, safety and education needs. The success of public health programs in preventing transmission of communicable diseases in such communities relies on close collaboration between public health units, Indigenous organizations, local leadership and local health and social programs.

Important considerations for in-person learning in rural, remote, Indigenous communities and resource-limited urban communities:

- Appropriate resources should be provided to ensure adequate space is available to support consistent in-person learning in these communities, and to ensure equitable access to digital learning resources. In the event spacing presents as a challenge in the educational setting, partnerships with local Indigenous organizations should be explored.
- Aging infrastructure, including HVAC and supplemental ventilation/filtration systems that do not support good indoor air quality particularly in the colder months, is found in numerous schools in rural, remote and Indigenous communities. These schools should be identified and prioritized for the provision of HEPA filters/units and upgrades to achieve adequate indoor air quality as a permanent measure to prevent communicable disease.
- Shared transportation to and from school and school-based therapy services may impact communicable disease transmission risks, given close contact between students in closed spaces for prolonged periods of time. This should be considered when weighing the benefits/risks of implementing additional temporary

measures (e.g., masking, physical distancing).

- Most First Nations have Education Departments who oversee Boarding home programs for their students who leave the community. Where First Nations, Métis, and Inuit students must relocate to larger urban areas to attend a provincially-operated secondary school, housing options should be reviewed by an organization in the urban area to assess suitability of housing for students.
- Connect Indigenous youth with local Indigenous agencies, including Indigenous Primary Care Organizations, that enable social connectivity among youth, families and elders. Many of these agencies also offer childcare and nutrition programs and deliver culturally sensitive health care and public health education from trusted providers. When possible, all effort should be made to continue offering in-person programming in a safe and effective manner during the school year to support urban and rural youth.
- If a testing strategy is implemented, local testing strategies (e.g., SARS-CoV-2 rapid molecular testing) should be considered to support communities with infection-related clusters if there are transportation-related challenges to accessing regional laboratories for molecular-based testing and results.
- School boards should ensure clear accountability for education assessment and supports, whether through federal or provincial resources and in collaboration with local Indigenous organizations.

In recognition of the disproportionate impact of the COVID-19 pandemic and its associated public health restrictions on children and youth, including those who are Indigenous and those living in marginalized communities with less access to outdoor space, the following recommendations facilitate increased outdoor activity levels among children and youth during and after the pandemic:

- Identify and remove barriers for outdoor learning and participation in outdoor physical activity and play at school. Invest in infrastructure, programs, training and policies now and for the upcoming school year to remove these barriers.
- Incorporate more outdoor physical activity into daily school lessons and programming, including active breaks and access to outdoor time to encourage physical activity and minimize long periods of sedentary behaviours among children and youth.
- Support continuity of school sports and other extra-curricular physical activities for the upcoming school year.

Special Considerations for Children and Youth with Medical, Physical and Neuro-Developmental Needs

Return to school must be inclusive of all children, including those with medical or physical disabilities, developmental and behavioural challenges, and medical needs. This includes children requiring intensive supports for activities of daily living and/or medical conditions, such as enteral feeding, positioning, toileting or breathing supports, as well as those who depend on schools for therapies and other critical supports for their learning, development, and well-being. Many of the families/caregivers of children with medical, physical, and developmental health needs have had a prolonged period of time in home isolation compounded by a lack of respite and/or homecare and school nursing support. In particular, challenges for families/caregivers and children/youth with neurodevelopmental disorders caused by cessation of school during the pandemic have been identified.[36] Consultation with children/youth and their parents/caregivers to better understand their individual circumstances and needs is recommended. Virtual learning can be extremely challenging for many children and youth with complexities, some of whom may reside

in temporary, unstable or congregate care settings. Moreover, they rely on caregivers for optimizing their own health and may be at risk of severe illness from COVID-19;[37] high vaccine uptake among this vulnerable group, and those among their in-person school and community supports, is important.[38,39]

The additional resource requirements to facilitate safe return to school should not be a barrier to meaningful access to in-person education for any child. Administrators should consider additional prevention strategies to accommodate the health and safety of students with disabilities, mental or behavioural needs and ensure equity in access to safe in-person learning.

Interpretation

This evidence brief has reviewed both permanent and temporary health and safety measures to reduce the risk of transmission of communicable infections in schools, including SARS-CoV-2 and other respiratory viral infections (e.g., influenza, respiratory syncytial virus (RSV)), and gastrointestinal infections (e.g., norovirus, rotavirus). Permanent measures include achieving and maintaining adequate indoor air quality, hand hygiene, environmental cleaning and disinfection, students and staff staying home when sick, and up-to-date routine and recommended immunizations for students and staff. It is important to ensure the equitable distribution of permanent measures between schools and communities, with a focus on supports and resources for marginalized communities and vulnerable populations that have been disproportionally impacted by the COVID-19 pandemic.[4]

Considerations of when and how to modify temporary measures in schools and which measures to implement should be informed by continuous monitoring of evolving epidemiology of the communicable illness and their health system impacts. Decisions should evaluate the benefits and harms of the measures and should be made in collaboration with the local public health unit, Ministry of Health and Ministry of Education.

Methods Used for This Science Brief

This Science Brief draws on evidence syntheses developed by Public Health Ontario, the COVID-19 Evidence Network to support Decision-making (COVID-END) and the Evidence Synthesis Network. The COVID-19 Evidence Synthesis Network is comprised of organizations in Ontario's evidence synthesis and knowledge translation community who collectively provide high-quality, relevant, and timely synthesized research evidence about COVID-19. Specific literature describing topics in this brief were identified manually by key informants, authors or contributors following database searches.

Author Contributions

MS, NT, and AB conceived the Science Brief. MS, NT, AB, and UA wrote the first draft of the Science Brief. All authors revised the Science Brief critically for important intellectual content and approved the final version.

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