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Assessing the Possible Benefits and Serious Cost of
COVID-19 School Closures on Canadian Children

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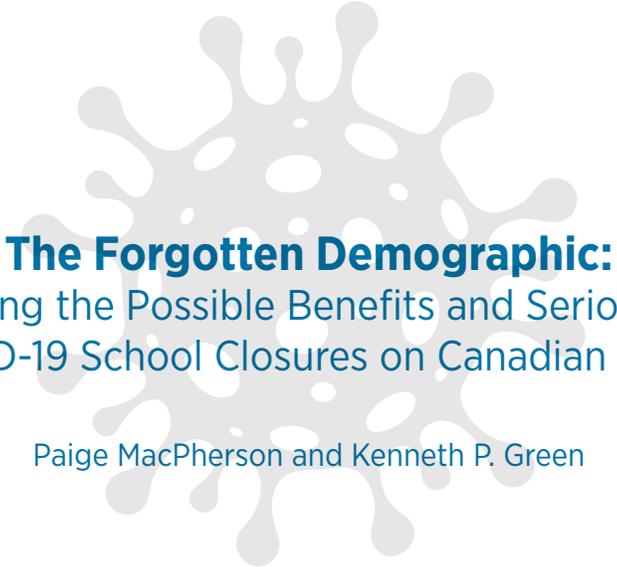
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A large, light gray, stylized virus particle with multiple protrusions, centered in the background of the title section.

The Forgotten Demographic: Assessing the Possible Benefits and Serious Cost of COVID-19 School Closures on Canadian Children

Paige MacPherson and Kenneth P. Green

Introduction

When the COVID-19 pandemic hit at the beginning of 2020, entire populations halted socializing, schooling, and commerce to “stay home and save lives” in the face of uncertainty about the severity and transmissibility of the virus. Quickly, however, data emerged about the actual risk posed by COVID-19 to various age groups. This new data should have guided Canadian governments’ responses to the risk, balancing virus transmission with the well-being of people and the economy. Yet school closures ended up spanning three school years, and the response was not a reflection of the data.

This paper focuses on school closures to help weigh the costs and benefits of pandemic policies imposed on children by governments. First, the paper reviews the epidemiological benefits of school closures, asking to what degree children were at risk, whether school closures would stop transmission, and at what point did we have the answers to those questions. Second, the paper assesses the non-monetary costs of school closures, including an international literature review of the impacts on youth mental health, an examination of the significant spikes in severe absenteeism, and an analysis of the available provincial student test scores comparing 2018-19 and 2021-22 to assess learning loss. Ultimately, this paper asks: were school closures worth the consequences suffered by Canadian kids?

School closures: A recap

Depending on the province, K-12 schools in Canada were closed for up to 27 weeks during the pandemic, and in many individual schools and regions the closures extended far beyond that. Table 1 outlines the number of weeks schools were closed in each province.

The data in table 1 indicate the *minimum* length of time schools were closed; individual regional school closures extended students’ lost classroom time in all provinces (the sources for table 1 are

listed in the References section and rely on reporting from both government and media). There is no clear “official” picture from governments as to how long schools were closed and how many classroom days students missed—a fact that should give readers pause. Barret et al (2021) give a comprehensive overview of provincial school closures from March 2020 to May 2021, but closures in various school districts in each province extended beyond this date. Table 1 attempts to give a comprehensive summary of *provincial* school closures in Canada, but only represents a minimum time.¹

PROVINCE	NUMBER OF WEEKS CLOSED
British Columbia	10 weeks
Alberta	22 weeks
Saskatchewan	15 weeks
Manitoba	21 weeks
Ontario	27 weeks
Quebec	11 weeks
New Brunswick	19 weeks
Nova Scotia	25 weeks
Prince Edward Island	20 weeks
Newfoundland & Labrador	20 weeks

Source: See the source list available under “Table 1 sources” in the References section of this paper.

During these closures, students were usually expected to learn virtually. From province to province, community to community, and child to child, students received different forms of schooling. Some students did “virtual schooling” whereby students joined (some) of their classmates and teacher online for shorter periods of time than a typical school day, and lessons were delivered virtually. Some areas offered blended remote/virtual learning models; some families opted to homeschool or establish learning pods. As Barret et al (2021) noted, after children were allowed to return to school in

Ontario, parents were still given the choice to keep their children home or continue with blended virtual/remote learning (consistent with other provinces), unfortunately implying to parents that these education delivery models are interchangeable. Across Canada no province offered a consistent method of education that students (who would typically be in school) would receive during school closures, and shockingly, there is no detailed official national account of the closures and learning loss or other impacts.

“Across Canada no province offered a consistent method of education that students would receive during school closures”

School closure data does not account for additional missed classroom time. A number of different circumstances led to the additional missed time. First, individual schools and classrooms were closed intermittently due to COVID-19 “outbreaks,” which Health Canada (2020) defined as two or more COVID-19 cases in a specific location. Second, during the pandemic, illness policies became very strict in daycares and schools. If a child had any symptoms

¹ There were some small differences between elementary and secondary school closures in some provinces, but these were not significant.

that *could* be COVID-19 (runny nose, cough, stomach pain, or skin rash)—and in some cases, if anyone in the home had any of these symptoms—the child was instructed to stay home for a period of time (which differed based on local rules). It is fair to assume that this led to a material amount of missed classroom time as it is normal for a young child to get 12 colds or more per year and be symptomatic for up to 14 days each time (Nellis, 2022). Third, many schools regularly experience closures due to external factors unrelated to COVID-19 that cause additional days lost. Nova Scotia schools, for example, average 10 “snow days” per year—two full weeks out of the classroom—during a normal year (Bennett, 2019: 6).

In addition to school closures, students faced many disruptions in their schooling making their intermittent classroom time far from normal. Children—in some provinces as young as age two—were forced to wear masks during school (Nova Scotia Health and Wellness, 2020). Frequent use of hand sanitizer became the norm, as did grouping students into small cohorts, erecting plexiglass barriers, and ensuring that people and desks adhered to social distancing rules. Children were told to face forward and not to speak during lunch when their masks were off (O’Brien, 2021). Vaccine mandates barred many children from extracurricular activities and sports.



Across Canada, children experienced school disruptions from March 2020 to at least February 2022; 19 months of disrupted learning spanning three school years.

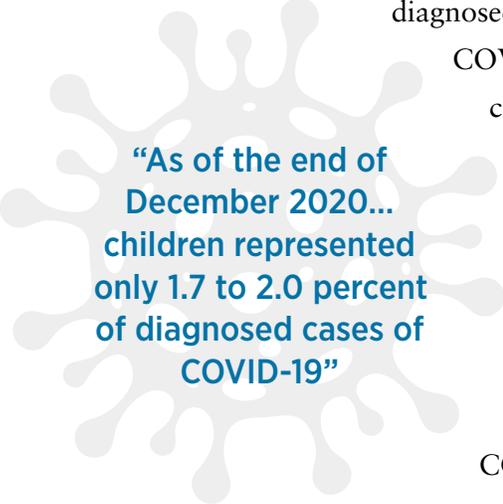
Assessing the benefits of school closures

Government officials offered two justifications for school closures in wake of the COVID-19 epidemic. The first was that closures would protect children from exposure, sickness, and possibly death. The second was that closing schools would slow the spread of COVID-19 through the general population by eliminating schools as super-spreaders of infection. Neither of these justifications was built on a solid ground of expectations based on experience with previous epidemics (influenza and coronaviruses). Data showing their general ineffectiveness was well established by at least the end of 2021 (to be generous), and realistically, much earlier.

Were children at high risk of severe (or even moderate) illness from COVID-19?

Retrospective analysis shows conclusively that children, particularly young children (under 10 years of age) faced lower risks to their health from COVID-19 than did any older age group. This was well

established by the end of 2020, with much data emerging earlier. In March 2020, for example, Dr. David Katz of Yale University published an op-ed in the *New York Times*, indicating data showing that COVID-19 posed little risk to children (Katz, 2020). In the *Journal Pediatric Clinics of North America*, researchers Tsabouri et al (2021) summarized the state of understanding in the literature as of the end of December 2020, and showing that children represented only 1.7 to 2.0 percent of diagnosed cases of COVID-19. Children were found to have milder cases of COVID-19 than adults, and fatalities from COVID-19 infection among children were rare. Those who were severely affected were usually already suffering from significant co-morbidities.²



“As of the end of December 2020... children represented only 1.7 to 2.0 percent of diagnosed cases of COVID-19”

A special Morbidity and Mortality Report by the US Centers for Disease Control published at the end of 2020 corroborates the low risk to children based on US data. Researchers showed that from February 12 to July 31, 2020, young people (under 21 years of age) represented approximately 0.08 percent (8 in 10,000) of all COVID-19 deaths in the US (Bixler et al., 2020).

Another corroborating study from the British research team of Smith, Odd, and Harwood (2022) showed that of 12,023,568 “children and young people” living in England, 3,105 died from March 2020 to February 2021 (considered the first year of the pandemic). Of those 3,105, 61 had tested positive for COVID-19. Of these 61 deaths, 22 were considered to be caused by COVID-19: In total, Smith et al report, 99.995% of children and young people with a positive COVID-19 test survived.

Did school closures reduce transmission of COVID-19?

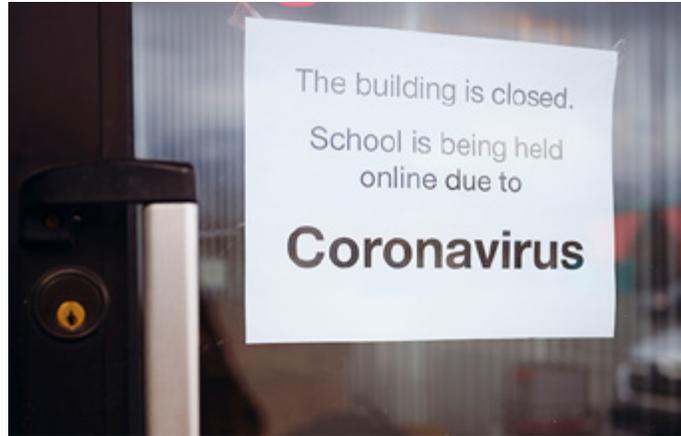
Whether or not school closures reduced transmission of COVID-19 is uncertain, as most of the studies examining this question have come up with ambiguous results of low statistical significance and low confidence in the structure of the research.

A recent review of the literature by the Cochrane Library suggests that the most rigorous studies examining this question are ambiguous, yielding decidedly mixed results.

In a survey of studies published as of December 2020, the research team of Krishnaratne et al. (2022: 2) examined “38 unique studies in the analysis, comprising 33 modelling studies, three observational studies, one quasi-experimental and one experimental study with modelling components.” Krishnaratne et al. concluded that while the preponderance of evidence suggested school

2 Based on studies from China, United States, Italy, South Korea, and other countries.

closures might have positive impacts on reducing transmission and reduce health impacts to school children, the evidence was of very low quality, and “most studies assessed the effects of a combination of interventions, which could not be disentangled to estimate their specific effects” (p. 2). More specifically, Krishnaratne et al. observed that for the studies reviewed, “Across all intervention categories and all study designs, very low- to low-certainty evidence ratings limit our confidence in the findings” (p. 2).



The Cochrane findings are corroborated by another analysis of systemic reviews on school closings published in the *British Medical Journal* in 2023. In that paper, Hume, Brown, and Mahtani characterized the findings of 26 systemic reviews pertinent to the school-transmission question. They conclude: “We found evidence that both school closures and in-school mitigations may have had a beneficial impact on reducing COVID-19 transmission in the community. However, the GRADE [a measure of research quality] certainty was very low in both outcomes” (2023: 172).

The consensus of available literature (based on research available at the time of writing) seems to be that school closures may have helped slow the transmission of COVID-19, but not strongly enough to be detected definitively.

Should public health authorities have known that school closures might do more harm than good?

The current debate over school closures and their impacts on children is often infused with suggestions that public health officials at the time were acting in a state of uncertainty, even ignorance about the risks and benefits of school closures.

When COVID-19 struck in 2020, understanding about how school closures related to the spread of a virus through school populations were based mostly on studies of influenza, which were also mixed in their assessments. One interesting study on the question from a decade earlier came out of University College London by a research team that included Neil M. Ferguson, whose initial modeling of COVID-19 shaped the world’s response to the pandemic (Cauchemez et al.). That study concluded regarding school closures for influenza: “Although some health benefits can be expected, there is still substantial debate about if, when, and how school closure policy should be used. There is no consensus on the scale of the benefits to be expected, and recent reviews highlighted the lack

of evidence for social distancing measures such as school closures. Even if benefits are substantial, they must be weighed against the potential high economic and social costs of proactively closing schools, which also can have negative effects on key workers since, for example, many doctors and nurses are also parents” (Cauchemez et al., 2009: 473).

But there was more pertinent data that suggested school closures were an inappropriate policy intervention for coronaviruses like COVID-19. Viner et al., a research team at University College London, observed: “It is unclear whether school measures are effective in coronavirus outbreaks—for example, due to severe acute respiratory syndrome (SARS), or Middle East respiratory syndrome (MERS) and, most specifically, COVID-19, for which transmission dynamics appear to be different” (Viner, Russell, Croker, et al., 2022: 397). Viner et al. noted that “In some previous coronavirus outbreaks, evidence suggested that transmission in schools was very low or absent” (2022: 398). They further noted that while still early in the pandemic, evidence from China showed little transmission of COVID-19 through schools. This was also mentioned by Tsabouri et al. (2021) who found that MERS and SARS, the two major previous epidemic coronaviruses to have been intensively studied, did not affect children widely.

Should schools have been closed?

One can argue that public health officials were well-intentioned but erroneous in their guidance to close schools. However, one cannot reasonably argue that they were doing their best with no information. There was information available at the time that cast doubt on children’s school-based health risk from COVID-19, and the efficacy of school closures at reducing that risk, or the spreading of COVID-19 risk to others. Public health authorities had the responsibility to assess prior knowledge before they acted, and it seems clear that they were derelict in that duty.

Assessing the costs of school closures

Learning loss was significant and students haven’t caught up

As provincial student assessment data is emerging—after a regrettable pause in nearly all province-wide assessments during the pandemic—we have a preliminary picture of how students are performing academically now versus pre-school closures. It will take several years of data to completely assess the impacts of school closures on student learning and wellbeing, so what we have now is our first peek into the window of how students are doing.

It would be unreasonable, of course, to blame all learning deficits on school closures. It is fair to say, however, that if a student was already struggling, that student would not have been well served by school closures. At the same time, it is also likely that some students were *better* served by at-home

learning. The benefits of school are many and complex, and the total ramifications of school closures may be impossible to assess. What's clear is that learning loss occurred following school closures and virtual learning did not optimally serve students' learning needs in an aggregate sense.



The following is a selection of data comparing provincewide assessment results in 2018-19 (the last full school year unaffected by school closures) with that from 2021-22 (the first school year with available test data following school closures). British Columbia, Alberta, Ontario, and Nova Scotia all halted provincewide assessments in 2019-20 and 2020-21 (in the latter year, testing was made optional in Alberta), making 2021-22 the first year of comparable data in each of these provinces. The following analysis reflects the data each respective government has made available at the time of writing. Comparable data are not yet available for every province.

British Columbia

In BC, where schools were closed for a shorter period than in any other province (a minimum of 10 weeks), student test results are mixed. BC students take Foundation Skills Assessments in grades 4 and 7 annually, measuring reading, writing, and numeracy, and students in grade 10 and 12 take literacy and numeracy assessments (Zwaagstra, 2022). In 2021-22, BC combined reading and writing scores under one category, literacy, meaning numeracy is the only truly comparable category. Still, it is noteworthy that provincial average literacy scores fell below the respective scores in both reading and writing for grade 7 students following school closures. In numeracy, grade 4 average scores increased marginally, and grade 7 average scores dropped.

Alberta

By contrast, Alberta closed schools for a minimum of 22 weeks. Alberta administers Provincial Achievement Tests (PATs) annually to all students in grades 6 and 9, and course-based Diploma Exams in grade 12, which are counted toward students' final grade (Zwaagstra, 2022). Alberta's grade 6 PAT scores were available at the time of writing and across all subjects—language arts, science, math, and social studies—Alberta students saw minor declines (Cowley and Emes, 2020; Alberta Ministry of Education, 2023).

As the Calgary Board of Education noted (2022), the number of students who passed the grade 12 diploma exam in Math 30-1 declined by 18 percent from 77.8 percent of students in 2018-19 to 63.6 percent of students in 2021-22. The number of grade 12 students who passed the English 30-1 exam declined by 9 percent, from 86.8 percent in 2018-19 to 78.8 percent in 2021-22. This is significant given the importance of the diploma exams.

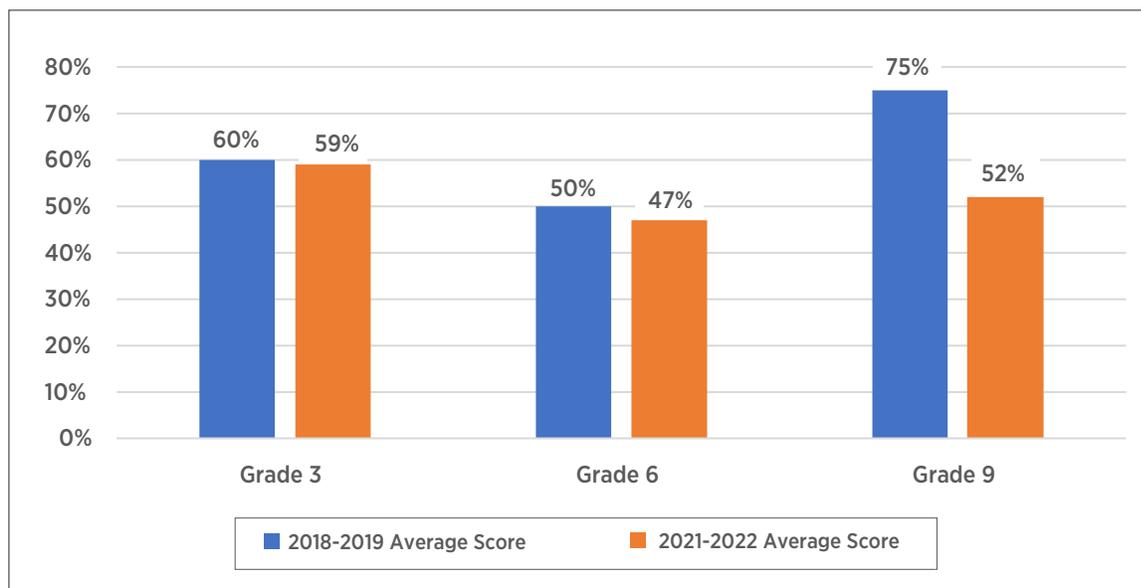
Ontario

Ontario schools were closed for longer than in any other province—a minimum of 27 weeks. The Education Quality and Accountability Office (EQAO) administers provincewide tests in grades 3 and 6 in reading, writing and math, a grade 9 adaptive math test, and the Ontario Secondary School Literacy Test (OSSLT) in grade 10. Provincial average scores in all subjects declined in grade 3, with a 10 percent drop in writing scores in 2021-22 versus 2018-19. Comparable grade 6 scores were mixed, and OSSLT scores improved marginally (EQAO, 2022a–2022e).

What is consistent across all grades is a drop in average math scores, as figure 1 illustrates. Average math scores in grade 9 dropped from 75 percent to 52 percent following the school closures.

It is important to note a few changes to math in Ontario independent of school closures. In the fall of 2021, the Ontario government stopped streaming (dividing students based on their academic level) in grade 9 math courses. The province also introduced a new math curriculum in 2020 for grades

Figure 1: Ontario provincewide assessments before and after school closures, mathematics*



*Provincial average score

Source: Ontario Education Quality and Accountability Office provincewide student math assessments, grades 3, 6 and 9 (EQAO, 2022a–2022e).

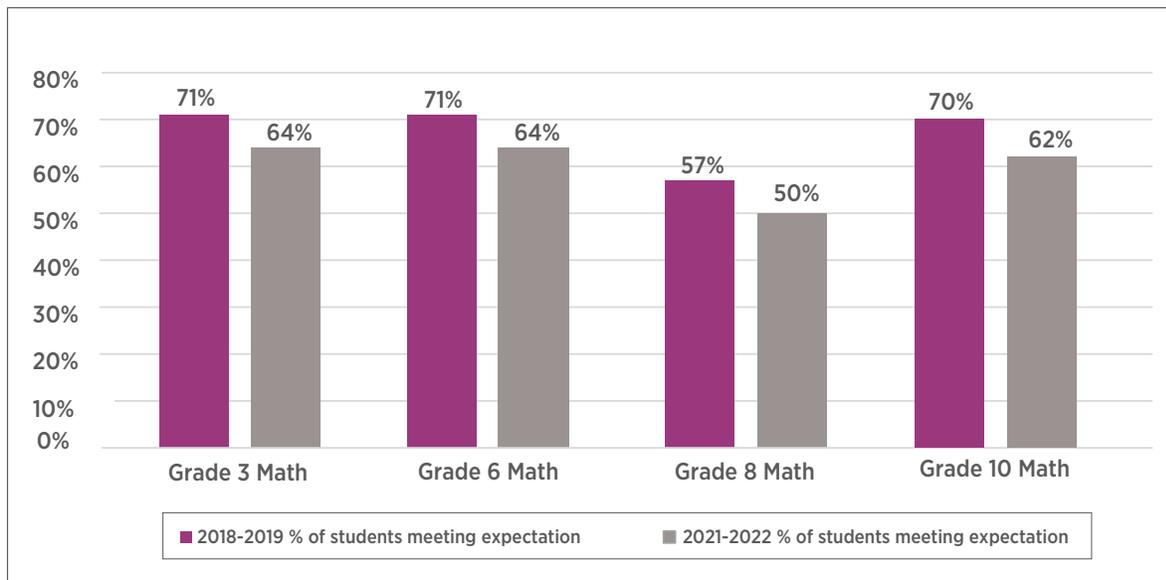
1 to 8. Finally, the EQAO introduced digitized assessments in 2021-22, a change from the previous paper-based tests. Still, the EQAO's own analysis cites the pandemic as having a significant impact on student performance in math (EQAO, 2022, October 20).

Nova Scotia

Nova Scotia administers provincewide assessments in reading, writing, and math to grades 3, 6, and 9, and course-based exams in English and math in grade 10 (Zwaagstra, 2022). The education ministry makes public the percentage of students who met the provincial expectation in each grade, for each assessment. In 2021-22, the provincial expectation in writing changed, meaning only reading and math are comparable with 2018-19 results (Sarah Curry, Program Manager, Student Assessment and Evaluation, Nova Scotia Ministry of Education and Early Childhood Development, personal communication, July 7, 2023). Still, it must be noted that the share of grade 3 students meeting the provincial expectation across four writing categories ranged from 32 percent to 50 percent (Nova Scotia Department of Education and Early Childhood Development 1, 2022), a significant drop from 2018-19. Even without the comparison, the results are deeply concerning.

Across all grades in reading and math, the share of Nova Scotia students meeting the provincial expectation declined after the school closures (Nova Scotia Department of Education and Early Childhood Development, 2022a–2022e). As figure 2 shows, student performance in math declined

FIGURE 2: Nova Scotia provincewide assessments before and after school closures



Source: Nova Scotia provincewide student math assessments, grades 3, 6, 8 and 10 (Nova Scotia Department of Education and Early Childhood Development, 2022a–2022e).

significantly. Following government school closures, there was a 10 percent decrease in the share of students meeting the provincial expectation in math in grades 3 and 6, a 12 percent decline in grade 8, and an 11 percent drop in grade 10.

As noted, these results are preliminary. The coming years will paint a more complete picture of student performance following government school closures and disruptions to education. Math scores were already declining across Canada prior to the onset of COVID-19 (Allison, 2021), but the sharp declines in Ontario and Nova Scotia are red flags, particularly given that Ontario and Nova Scotia imposed the longest school closures in the country, with 25 weeks and 27 weeks as respective *minimum* closures. While school closures gave children little to no benefit, they came at a significant cost. Prior to COVID-19, research had already established that missed classroom time has consequences, as will be discussed below.

Putting the learning loss in perspective

The issues observed in domestic testing results are buttressed by emerging international research, which has clearly established that school closures did result in learning loss. In 2022, the United States' so-called "Nation's Report Card," the National Assessment on Educational Progress, showed the largest decline in math scores in 50 years for 13-year-olds and a significant decline in reading scores compared to 2019. These test scores show learning loss affected children unevenly, widening gaps between vulnerable and high-achieving students as the lowest-performing students suffered the most significant declines (St. George, 2023).

Prior to the arrival of COVID-19, research had already demonstrated that missed classroom time does result in learning loss and has individual life-long impacts such as a reduction in lifetime earnings, and societal impacts such as a reduction in economic activity (GDP) (Hanushek et al., 2020). Education analyst Paul Bennett had assessed the impact of school closures due to inclement weather, pointing to numerous findings that school closures compound absenteeism and adversely affect student achievement and social progress (2019: 10-12).

Specific cohorts of students appear to have been particularly hard hit by COVID-19 school closures—for example, students who were learning to read. An analysis by Côté, Larose, and Haeck (2023) at the EdCan Network looked at grade 4 reading assessment results in Quebec, comparing a 2019 cohort of students with a 2021 cohort. They found an average 8.4 percentage point decline in reading amongst grade 4 students from June 2019 to June 2021. Their findings show children who were already strong in reading (top 20 percent) experienced little to no learning loss, but children in the bottom 20 percent experienced significant declines.

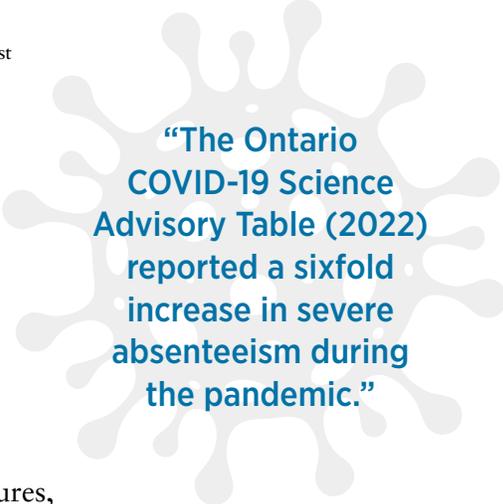
A summary of grade 12 diploma exams in Alberta comparing 2021-22 results with the previous 3-year average, showed that while all student cohorts declined, students whose first language is not English showed the largest decrease—a 10 percentage point drop (Calgary Board of Education, 2022).

Many children became severely absent

Another internationally documented consequence of school closures is an increase in what is known as severe absenteeism—when a child is away from school more than she is in school. Research from several countries shows that this problem is not temporary; rather, it is worsening in the years following school closures. The Centre for Social Justice (2023) in the United Kingdom found that nearly 100,000 children became severely absent in the fall of 2020. By the summer of 2022, there was a 137 percent increase in severe absence.

In the United States, Johns Hopkins University and Attendance Works (2022) found that nationally at least 10.1 million students in public schools were chronically absent during the first full year of the pandemic—a 25 percent increase from the roughly 8 million students severely absent in prior years. Meanwhile, a selection of states that have made data available report that in 2021-22, the second full year of COVID-19-affected learning, absenteeism appears to have dramatically worsened, with rates likely doubling from pre-pandemic levels.

The Worldwide Commission to Educate All Kids at the Institute for 21st Century Questions (2023) has shared concerns that severe absence is a problem in Canada, too, and that these “missing children” risk life-long impacts from essentially dropping out of school. To take one provincial example, the Ontario COVID-19 Science Advisory Table (2022) reported a sixfold increase in severe absenteeism during the pandemic.



“The Ontario COVID-19 Science Advisory Table (2022) reported a sixfold increase in severe absenteeism during the pandemic.”

Youth experienced a rise in depression, anxiety, and suicide

During government-imposed COVID-19 lockdowns and school closures, children spent much of their time in isolation, with government shuttering opportunities for physical activity and socialization. In cases of abuse or food insecurity at home, the individual impact of school closures on children was likely much greater.

Furthermore, it is clear now that during government-imposed COVID-19 policies, Canadian youth were experiencing a mental health crisis. A Mental Health Commission of Canada (2020) survey of youth found that 64 percent of Canadians aged 15 to 24 had self-perceived poor mental health during the pandemic, higher than any other demographic (the youngest age surveyed was 15). With every



advance in age group, there was a decrease in self-perceived poor mental health. Those aged 65 and older, who were statistically most at risk for negative COVID-19 health outcomes, self-reported the lowest levels of poor mental health during the pandemic, at only 35 percent. Statistics Canada data showed about 36 percent of youth were very or extremely concerned about family stress from confinement.

Perhaps it was the case that it was not government policies that adversely affected children's mental health, but rather fear that they or their loved ones might contract COVID-19. However, the commission found that the number one challenge that kids faced during the pandemic was isolation/loneliness (49 percent of youth surveyed), with the next-greatest impact being school closures (affecting 33 percent the most). The fear that they or others would contract COVID-19 was the primary concern for only 2 percent of youth surveyed.

The Toronto-based Centre for Addictions and Mental Health (CAMH) conducted a comprehensive survey of Ontario students in grade seven to 12, between March and June 2021, with troubling results. Of those surveyed, 59 percent said the pandemic made them feel depressed about the future. One in five reported intentional self-harm within the past year, and 18 percent had suicidal thoughts. One quarter of students said virtual learning was "very difficult" or "extremely difficult." Importantly, the same survey found that 91 percent of students reported feeling safe at school, and 74 percent reported feeling close to people at school and feeling like they are part of their school (Boak et al, 2022). CAMH's COVID-19 National Survey Dashboard, which compiles survey results from May 8, 2020 to January 11, 2022, showed that those aged 18-39 were more likely than any other age category to experience moderate to severe anxiety, peaking at 33.5 percent of respondents in January 2022. By contrast, only 16.4 percent of those aged 60 and older experienced moderate to severe anxiety, peaking in May 2020 (CAMH, January 2022).

A University of Calgary study found that emergency room visits due to suicide attempts by youth (under 18) increased by 22 percent during the pandemic. Alberta Children's Hospital pediatric emergency physician Dr. Stephen Freedman told media that visits from kids for mental health reasons were extremely low pre-pandemic but dramatically increased as the pandemic wore on (Zapata, 2023). The Center for Suicide Prevention and Research at Nationwide Children's Hospital (2023) in Ohio also found an overall increase in the youth suicide rate, but for the United States.

Increased inequality

One of the more tragic impacts of school closures is the potential for an increase in societal inequality, amounting to a reversal in the equality gains we have made over many years. In their research for the World Bank, Azevedo, Hasan, and Goldemberg et al. (2023) noted that school closures worldwide could amount to a loss of 0.3 to 1.1 years of schooling, reducing students' lifetime effective years of basic schooling, with school closures possibly exacerbating the inequality faced by girls, ethnic minorities, and disabled children. All affected students could face a reduction in lifetime earnings of tens of thousands of dollars. Their analysis considered a global school closure of five months. This research estimated the global toll of learning losses in the trillions of dollars.

Further research might also explore the differential effects on children with disabilities, and those from vulnerable circumstances or low-income families. The youngest children have unquestionably been affected by government closures of childcare facilities during the pandemic specifically because of reduced opportunities for socialization, and further research could explore the impact these policies have had on speech and language and social-emotional development in the coming school years.

Conclusion

Despite the clearly foreseeable negative impacts to children from school closures, some might argue that the cost-benefit analysis of doing so was ambiguous. Yet there is no good reason to accept that policymakers were doing their best with no information. It was clear early in the pandemic that children were at very low risk from COVID-19. There was no good evidence showing that school closures would slow the transmission. The known side effects of school closures, raised in 2020 and based on established research, however, were abundant: Canadian children experienced significant learning loss and will suffer life-long impacts; many have left school altogether; youth are still caught in a mental health crisis; and inequality has deepened. The lack of authoritative government accounting of school closures and their impacts given the magnitude of the educational, social, and economic impacts on children and families is concerning. A preliminary review of student performance showed notable declines in five provinces, with steep drops in math scores in Ontario and Nova Scotia, the two provinces with the longest school closures. The impact of the government's COVID-19 policies on children was unprecedented and while the full effects are not yet evident, the harm imposed will have left lingering legacies in the lives of Canadian kids.



“Canadian children experienced significant learning loss and will suffer life-long impacts; many have left school altogether; youth are still caught in a mental health crisis; and inequality has deepened.”

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