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# Assessing the Impact of COVID-19 on Routine Childhood and School-Based Immunizations and Investigating Strategies to Catchup on Missed Immunization Opportunities in Canada

A Flash Review

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# **Assessing the Impact of COVID-19 on Routine Childhood and School-Based Immunizations and Investigating Strategies to Catchup on Missed Immunization Opportunities in Canada**

**Mesh terms and keywords:** Routine, Vaccinations, Covid-19, Childhood, School-based, Immunizations.

## **Question.**

The Covid-19 pandemic brought about a worldwide impact in various countries. These have caused public health issues among the people living in Canada. This pandemic caused an immediate lockdown and protective measures to curb the viral spread, which affected many sectors and caused the temporary closure of clinics and educational institutions. These have impacted areas that involve immunization coverage, especially for childhood and school-based immunizations. Due to this halt, childhood and school-based immunizations could not be administered through conventional means. Although the level of disruption is unknown, the closure of schools and primary health care facilities during this period has caused a gap in routine immunizations. This begs the question on how measures to decrease the exposure to Covid-19 has led to increasing the amount of youth now susceptible to vaccine preventable diseases. These issues have raised concerns among public health professionals on consequences of missing this cohort of youths, improving other ways of vaccination coverage that solely depends on schools and finally, how to implement catch up programs.

In this flash review, we will understand the level of disruption in Canada, assessing the impact of Covid-19 on childhood and school-based immunizations. This review will also present findings on understanding the implications of missing vaccinations and its impact in the future and, finally catchup programs implemented and its progression.

## **Review and search strategy.**

A search strategy conducted using Ovid Medline from University of Saskatchewan database using words “Covid-19” (1), “Vaccinations” (2), “Immunization programs”, “Routine” (3), “Canada.” Mesh words such as vaccinations (2) AND “Immunization programs” (3)(4). (5) “Routine” AND “Covid-19” AND “Immunization” (1&4), (6) “Routine”, “Covid-19” AND “Vaccinations” AND “Immunization programs” AND “Routine AND Canada”. In addition, Google Scholar searches of relevant article titles obtained from the above search were used, and

their citations were explored. Furthermore, grey literature search using Canadian Newsstand using Mesh words “Routine childhood vaccinations” AND “Covid-19 in Canada”. We restricted the search to studies in English and published not more than ten years ago. APA was used for referencing.

### **Findings and discussion**

The COVID-19 pandemic interrupted life-saving routine immunization programs across the globe, placing thousands of children in danger of diseases that were prevented by immunizations in industrialized as well as in low- and middle-income countries (BBC News, 2020). Many nations momentarily and reasonably halted preventive broad immunization campaigns against diseases like meningitis, measles, polio, pertussis, polio, tetanus, and diphtheria (Ener et al., 2021). Considering, the risk of becoming infected along with the necessity to uphold physical distance throughout the COVID-19 pandemic (WHO, 2020). A recent UNICEF report indicated that over 67 million children failed to receive their scheduled vaccines between 2019 and 2022 in the 55 countries studied, including Canada and of those, 48 million did not obtain a single dose of routine immunization, or what is known as a "zero-dose." (Johnston,2023). McDonald et al. (2020) as cited by Sell et al. (2021) mentions that in the three weeks after the implementation of physical distancing measures in late March 2020, England's measles, mumps, and rubella (MMR) vaccination rates dropped by 19.8%. Notably, data from New York City revealed a 62% decline in immunization for infants under two years old during the pandemic's early phases (March-April) compared to the same time in 2019. In a statement by UNICEF, the organization expressed concern that covid-19 fueled the decline in vaccine confidence which manifested as the greatest sustained backslide in childhood vaccination in 30 years. When evaluating the 2019 to 2021 timeframe within the last three-year period, UNICEF reports that the number of children paralyzed by polio has increased by eight folds highlighting the need to ensure vaccination efforts to catch up are maintained. (Johnson,2023)

Children and adolescents received significantly fewer vaccines because of pandemic-related disruptions, such as school closings and restricted access to doctors' offices. (Weeks, 2022) According to the systematic review that studied the issues on the impact of Covid-19 on global immunization rates by Seyed Alinaghi et al. (2022), the authors reported a decline in vaccination coverage for children and adolescents during the COVID-19 pandemic in Canada.

Similarly, in a retrospective study carried out in Ontario, Canada, it concluded that at baseline, from January 2019 to March 2020(T1, all children under the age of two had an average overall up-to-date (UTD) immunization coverage rate of 71.0 %. Then during the pandemic period from March 2020 to July 2020 (T2) there was a 5.7% decline in the UTD coverage rate. Although, overall UTD coverage increased slightly later in the pandemic from August 2020 to December 2020(T3), it still lagged by 4.1% behind pre-pandemic levels. (Ji et al., 2022) Additionally, this study discovered that the baseline percentage of timely immunization coverage decreased from approximately 88% for infants at two months old to 51% at 18 months old. (Ji et al., 2022)

Vaccinations during childhood are one of the most affordable and cost-effective public health initiatives that could lower the rates of morbidity and death from diseases that are vaccine preventable diseases (VPDs). (Aldakhil et al.,2021, as cited by Seyed Alinaghi et al., 2022) The importance of vaccines in preventing infectious disease-related deaths and hospitalizations is widely acknowledged, with estimations showing that immunizations could have avoided nearly one-quarter i.e. 21.7% of the 5.3 million deaths among children under the age of five worldwide in 2019. (Hamson et al.,2023) The COVID-19 pandemic caused delays that led to a reduction in immunization rates and a decrease in the spread of several infectious diseases; however, these rates have since increased because of the removal of COVID-19 restrictions, and modeling studies suggest an increased risk of increased morbidity and mortality from several vaccine-preventable diseases. (Hamson et al.,2023) An article report by Weeks (2022) Dr Dubey mentioned that only 55% of Toronto students have had all nine of the provincial immunizations required to protect against diseases including polio, measles, whooping cough, and others in an interview. The report also stated that public health officials in Ontario rely on parents to report their children's vaccination status and that their ability to assess routine immunization status has been impeded by a focus on COVID-19, which makes it likely that the 55 percent number understates vaccine coverage. Weeks (2022) also mentioned that while there has been a decline in vaccination uptake among infants and young children, experts believe the most significant decline appears to be for the immunizations commonly given in schools: the meningococcal, hepatitis B, and human papillomavirus vaccines. The Childhood national immunization coverage survey cNICS (2023) published that there were some coverage declines for vaccines measured at 7 years of age in 2021 compared to 2019 (e.g., DTaP coverage decreased by 6%, measles coverage decreased by 4%,

while polio and rubella coverage decreased by 2%), suggesting that the COVID-19 pandemic may have had an impact on vaccine doses required at school entry.

Public Health Agency of Canada (PHAC) 2020 cited by Gallent et al. (2023), reported that schools serve as children's learning environments and many accessible public health programs, such as school-based immunization programs. Also, Kolbe LJ as cited by Gallent et al. (2023) agreed that while there are differences in the vaccines provided, the grades in which they are administered, and the ways that the provincial public health authorities oversee these programs in schools is relatively the same and it is also provided for free in every province and territory in Canada. Parental concerns, about movement limitations or lockdown rules, shifting COVID-19 priorities among healthcare professionals, and logistical delivery challenges (such as delays in vaccine shipment) are some of the factors that contributed to delayed or halted immunizations. (WHO, 2020) According to the cNICS survey, 10% of parents with 2-year-olds had their vaccinations delayed for 30 days because of the pandemic, and 11% of these parents had challenges getting their children the vaccines that they needed because of the COVID-19 virus with 74% of parents surveyed reporting having trouble getting an appointment, and 36% were worried about coming into contact with COVID-19. (cNICS,2023)

A thorough registry to monitor immunization rates does not exist in the majority of Canada. Through emerging reports there is evidence that routine immunization rates, appears to be declining which could cause issues, especially once cities and schools reopen. (Weeks,2020) Different provinces have recorded a decline in their routine immunizations. According to Monika Naus, the medical director of the communicable diseases and immunization service at the BC Centre for Disease Control British Columbia, where officials have access to up-to-date data, the routine immunization rate for children under two is down from 2 to 5% using recent data in some places in British Columbia. (Weeks,2020) According to information from a preliminary analysis based on provincial health statistics, the rate of HPV vaccination coverage in Alberta decreased to 6.6% in 2020-21 from 66.1% in 2017-18. (Weeks,2020) In Ontario, less than 1% of 12-year-olds received their HPV vaccinations in the 2020-21 school year, compared to 58% in the previous year, based on the Public Health Ontario report. From 25% in 2019-20, the rate of hepatitis B vaccination uptake fell to 16.8% in 2020-21. The meningococcal disease vaccination rate also decreased from 67.2% in 2019-20 to 17.3% in 2020-21. (Weeks,2022)

In response to the decrease in British Columbia, the government started a marketing and social media campaign to nudge parents into scheduling their kids' vaccine appointments. (Weeks, 2020) Similarly, after observing a significant decrease in vaccination orders at the end of March and the beginning of April primary care officials in Ottawa created a special vaccination clinic for immunization catchup. (Weeks, 2020) Also, in order to address the gap, Ottawa Public Health is conducting catchup childhood immunization campaigns in schools, which include sending letters to slightly over 12,000 pupils whose records indicate missed immunizations and organizing special clinics. (Payne, 2023) Furthermore, Anne Pham-Huy a pediatrician, mentioned that in collaboration with the Children's Hospital of Eastern Ontario and other community stakeholders, Ottawa Public Health was able to establish a stand-alone, referral-based clinic that specializes in serving parents whose children were unable to receive the COVID-19 vaccine and is open three days a week. (Weeks, 2020) Public Health Ontario indicated in a report from January that OPH has already achieved notable progress with catchup clinics for school immunizations. (Payne, 2023) Sell et al. (2023) environmental scan revealed that 10 of 11 provinces and territories were reporting summer catchup initiatives to reach kids who had missed immunizations due to school closures, and all P/Ts revealing plans for fall catchup to reach remaining students, school-based vaccination programs were most likely to be targeted for catchup.

## **Conclusion**

In conclusion, quantifying the level of disruptions in childhood and school-based immunizations in Canada is essential in preventing vaccine preventable diseases. Vaccinations of children and school-aged children should be a priority to promote immunity to infectious diseases and improve overall health. Additionally, public health official's collaboration with people in the medical fields and the community will be essential to catch up with missed immunizations and decrease vaccination misinformation.



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