



EXECUTIVE SUMMARY

The Epidemiology of COVID-19 in Canada in 2020: The Pre-Vaccine Era

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An RSC Policy Briefing

Overview of COVID-19 Epidemiology in Canada

- Coronavirus disease 2019 (COVID-19), the disease caused by the novel coronavirus now known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), predominantly manifests as pneumonia, however, COVID-19 can also present with an array of extrapulmonary signs and symptoms.
- As of December 5, 2020, there have been 408,921 cases of COVID-19 in Canada and 1,088 cases per 100,000 people.
- The first wave of the COVID-19 epidemic in Canada peaked in mid-April 2020 with subsequent reduction in cases due to various public health interventions.
- As the epidemic has progressed Canadians have become less adherent to public health recommendations, and these trends in self-reported public behaviour coincided with a national R_0 exceeding 1.0 in early August 2020, and the emergence of a “second wave”.
- As of early December 2020, Canada’s case fatality rate (CFR), which represents the proportion of deaths among individuals diagnosed clinically with COVID-19, is 3.4%.

Public Health Response and Mitigating Transmission

Key Concepts

- Public health strategies strive to lessen the severity of the pandemic.
- Prevention of spread and amplification of cases within healthcare settings, including long-term care homes, is paramount.
- General practices employed for mitigation include, (i) masking, (ii) social/physical distancing, (iii) handwashing, (iv) cleaning of shared surfaces and objects, and (v) optimizing indoor ventilation and promoting outdoor interactions.
- With mitigation practices, the reproductive number of the virus (R_0) can be reduced.

Differences among provinces

- Provinces vary with regard to geography, population size and density, and health demographics, which results in variable pandemic impact.
- Provinces, which have jurisdiction over health, have varied in their public health approach to the pandemic, though there are common themes.

Masking policies

- Though contentious to some, masking has been demonstrated to reduce transmission of SARS-CoV-2 from person to person in a variety of settings and in combination with other mitigating practices.

Testing Strategies

- Screening and testing strategies are an important component of the Public Health response.
- Knowledge of risk and of confirmed positive COVID-19 cases is vital to the efficient and effective application of specific mitigation practices, including self-isolation and quarantine.
- Screening strategies may vary depending on population and pandemic factors within a region or province at a given time.

COVID-19 in Canadian Workplaces

- Collaboration among experts in public health, occupational health and safety, infection prevention and control, and employers can help to prevent the spread of COVID-19 in occupational settings and communities by implementing tailored preventative measures.
- Timely, transparent, and factual communication with the working population about areas of risk and safety is essential.
- There are no nationally standardized definitions for outbreaks across various settings in Canada. Attempts to make comparisons across settings and jurisdictions must take this into account when considering or setting policy, and when communicating about risk mitigation for the Canadian workforce.
- Supporting Canadian workers and establishing safe partnerships with public health teams in test-trace-isolate strategies will greatly facilitate disease control and help to contain other costs.
- Support for workers includes adequate and stringently monitored protections at work; access to testing; availability of protective equipment; education; sick day policies; job security; community supports; and the absence of discrimination.

The Impact of the COVID-19 Pandemic on Long-term Care Homes in Canada

- The COVID-19 pandemic has had a devastating impact on residents and staff of long-term care homes (LTCH) in Canada.
- Residents of LTCHs have accounted for approximately 80% of all COVID-19 related deaths in Canada.
- Reasons for the frequency, size and scale of outbreaks are multifactorial and complex, but involve delays in preparation, longstanding system challenges in the sector, as well as underlying resident factors.
- Outbreaks frequently overwhelm the local LTCH's ability to respond, requiring a larger system response; in some cases even involving the military.
- The clinical presentation varies widely in this population; morbidity and mortality in residents is high.

COVID-19 and the Education System in Canada

- COVID-19 symptoms are generally milder in children compared with adults, and children are less likely to become seriously ill. Available knowledge shows that children are less likely to be infected on exposure, and that transmission between children is relatively limited.
- Transmission in schools is relatively rare, but school-based cases appear to increase as community transmission rates increase.
- School closures have an uncertain effect on overall community COVID-19 transmission as they have usually occurred within the context of a set of public health restrictions.
- Older children and teens appear to transmit SARS-CoV-2 more like adults, although remain at low risk of severe disease or complications.

Severe COVID-19 in Canada

- The spectrum of COVID-19 is varied, however greater than 90% infected Canadians have recovered at home, 8% have required hospitalization, and one fifth of hospitalized patients have required intensive care. A quarter of those in intensive care have required ventilators.
- Risk factors for severe disease in Canadians include age (> 60 years old), male sex, and the presence of pre-existing medical conditions (such as diabetes, high blood pressure, chronic lung disease and obesity).
- Hospitalization, if required, usually occurs approximately one week after the onset of symptoms.
- Severe disease most commonly presents as acute respiratory distress syndrome (widespread lung damage) and appears to be associated with hyperinflammation.
- Risk factors for death mirroring those factors associated with severe disease—namely age and pre-existing medical conditions.
- Most countries, including Canada, have had to increase their hospital and ICU capacity during the pandemic. This has been accomplished through increasing physical (ventilators, beds, space) and human (mainly via redeployment) resources, suspending or delaying elective and non-urgent procedures, utilizing triage criteria in some regions, and utilizing models to predict the timing and severity of surges.
- Some patients experience varied long-lasting post-viral symptoms for weeks or months after acute COVID-19, calling for the need for multi-disciplinary post-recovery clinics.

COVID-19 within Vulnerable Populations in Canada

Key Concepts

- Vulnerable populations within Canada are at increased risk of acquiring SARS-CoV-2, do not access the healthcare system in traditional ways and appear to be at risk of more severe COVID-19.

Indigenous Peoples

- To date there is a paucity of publicly available or published data on COVID-19 and Indigenous Peoples.

- Research may help to determine optimal pandemic strategies for Indigenous people and individual communities, though it is critical that the OCAP® principles be respected.

Racial Disparity – Ethnic Minorities & Newcomers to Canada

- Reporting of comprehensive COVID-19 data in relation to race and ethnicity is currently limited in Canada.
- Minorities in Canada are more likely to have risk factors for severe COVID-19.
- Immigrants, refugees and other newcomers appear to be disproportionately affected by COVID-19 in Canada.
- The development of a national strategy to collect and report race and ethnicity data during the COVID-19 pandemic response.

People Who Use Drugs (PWUD)

- The public health crises impacting PWUD have been made worse by the pandemic.
- Mitigation strategies have made the management and prevention of substance use disorders more challenging.
- Unintentional illicit drug overdose deaths have increased during the pandemic.
- Many PWUD are at increased risk of acquiring COVID-19 and at risk of severe outcomes.
- Maintaining adequate management of substance use disorders during the pandemic will require advocacy and innovation.

People Who Are Homeless

- Homelessness in Canada presents key challenges for pandemic planning due to complex health, situational and structural vulnerabilities.
- The homeless population are at increased risk of viral acquisition and severe COVID-19.
- Ensuring adequate space for mitigating practices, including social distancing in shelters and other safe spaces for the homeless, is critical to community pandemic planning.

People Who Are Incarcerated

- Correctional facilities are associated with high rates of respiratory virus transmission, including SARS-CoV-2.
- Outbreaks of COVID-19 are being reported in Canadian correctional facilities.
- Decreased incarceration and increased decarceration with community supported re-entry can ease the burden of COVID-19 in correctional facilities.
- In this setting, calls for changes to drug policy and decriminalization in Canada have grown stronger.

Sex and Gender Disparities

- Sex and gender influence COVID-19 risk and outcomes.
- The pandemic has accentuated existing disparities.
- Health surveillance systems should include information pertaining to sexual orientation or gender identity to optimize the pandemic response and to support sex and gender minorities while lessening the risk for further stigmatization.

People with Disabilities

- Disabilities put many individuals at higher risk of COVID-19 infection.
- Disruption of services and supports due to the pandemic have a major impact on individuals with disabilities.
- There is a paucity of Canadian data pertaining to disabled communities during the pandemic.

Recommendations

1. Prioritize screening, testing and contact tracing to prevent transmission of COVID-19 infection in all settings. Ensure adequate investment in public health infrastructure for test-trace-isolate strategies during future pandemics.
2. Ensure timely and transparent public reporting on infections, hospitalizations, deaths, risk factors, and outbreaks, in order to maintain trust and understanding amongst Canadians. This can be used as a key strategy to keep Canadians engaged as partners in the prevention of COVID-19 transmission.
3. Develop a national strategy to collect and report race, ethnicity and other population-specific data to bolster the evidence-base informing the pandemic response and protections for high risk and vulnerable populations.
4. Establish nationally standardized definitions and case reporting requirements for outbreaks in various settings including workplaces and schools during pandemics.
5. Develop mechanisms for reporting COVID-19 infections acquired amongst workers and ensure effective systems are in place to monitor the provision and maintenance of adequate protection in places of work and care. Care settings are those settings where protection of staff and residents are linked such as healthcare, congregate living, and correctional facilities.
6. Utilize standardized case epidemiology and outbreak tracking to inform policy on vaccine allocation and to facilitate communication with the public about vaccination program implementation.