

## EVIDENCE BRIEF

# Evidence on Public Health Measures Required for Rapid Control of Variants of Concern

02/16/2021

## Key Messages

- There are currently warning signs that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) Variants of Concern (VOC) cases are increasing in Ontario. This increase continued during the provincial shutdown and related measures, and there is evidence of community VOC spread; Ontario now has a sub-pandemic of variants with higher transmissibility.
- Public health measures to address exponential growth rates of Coronavirus Disease 2019 (COVID-19), including VOC, have been successful in jurisdictions such as England and Denmark, where strict nationally-imposed lockdowns were recently implemented. Similar control of rates of COVID-19 have also been demonstrated in Ireland where only the strictest level of measures was effective to control spread.
- To minimise VOC spread in Ontario communities, the lockdown evidence and experiences from Europe demonstrate that any currently implemented public health measures should be intensified (i.e., longer duration of lockdowns, more stringent restrictions).
- ‘Circuit breaker’ approaches of lockdown interventions that are communicated publically as time-limited have not been successful to control spread of COVID-19 in higher prevalence jurisdictions and should not be used in this context. There is no evidence for their use in the context of highly transmissible strains and their effectiveness is expected to be significantly less due to VOC rapid growth potential.
- To maintain the reproduction number significantly below 1, measures sufficient to control B.1.1.7 originally identified in the United Kingdom (UK) should be implemented in mid-February. Later implementation of measures will lead to a B.1.1.7-associated resurgence with population morbidity, mortality and health system impacts.

## Background

Decreasing the duration of lockdowns has been a topic of interest for policy-makers and the public due to impacts on school, work, the economy, and other important aspects of daily life. Relatively brief

lockdowns with predetermined end dates (sometimes termed ‘circuit breaker’ or ‘fire break’) were proposed in 2020 as one approach to potentially reduce rates of COVID-19 resurgence. ‘Circuit breakers’ such as the October 2020 two week lockdown enacted in Wales have; however, led to short-lived, minimal impacts on reducing rates of COVID-19. In contrast, longer-term, strict lockdowns have demonstrated the most significant impacts to reduce rates of COVID-19, but carry with it significant short-term economic impacts.<sup>1-4</sup>

Modelling indicates that longer duration lockdowns, with the goal to eliminate or near-eliminate community transmission of COVID-19, are less economically damaging and significantly reduce the number of deaths, in the long-term, when compared to multiple short-term lockdowns that aim to mitigate COVID-19 transmission.<sup>4</sup>

This document briefly summarizes synthesised evidence about the duration of lockdowns, provides Ontario contextual data about variants of concern (VOC), as well as a brief overview of recent successful lockdown efforts to control VOC in selected European jurisdictions.

## Methods

Published Public Health Ontario (PHO) environmental scans provided the synthesised evidence about the duration of lockdowns and recent successful lockdown efforts to control VOC in Europe.

## Ontario Context and Epidemiologic Signals

The number of VOC cases is increasing rapidly in Ontario. As the prevalence of VOC rise, the gains the province has made in reducing case counts are expected to revert, based on learnings from other countries, as Ontario now has a sub-pandemic of subtypes with higher transmissibility. Currently, there are several signals observed that indicate VOC are in Ontario and growing quickly.

- VOC cases have been identified in multiple public health units (PHUs) (12/34 PHUs as of February 10, 2021).<sup>5</sup> Multiple cases have no epidemiologic link to other known VOC cases; as such, we can be confident that **VOC are spreading in communities in Ontario**. This includes PHUs in Ontario’s North that may have resource implications for their Northern, rural and remote health systems.
- While results from whole-genome sequencing take time, real-time screening results are indicative of prevalence. **The proportion who screen positive for the N501Y mutation has been increasing, such that it is clear that the province is on a trajectory to VOC (i.e. lineage B.1.1.7) replacement.**
- Available data on mutation screening include:
  - Screening for the N501Y mutation at select labs, including PHO. **The first week (February 3-9, 2021) of screening all SARS-CoV-2 positive specimens received indicated that 6.7% of**

**specimens screened positive for the N501Y mutation** (PHO, unpublished). This mutation is highly predictive of VOC cases for lineages B.1.1.7, B.1.351 (501Y.V2) and P.1.

- For context, the interim results from the point prevalence study on January 20, 2021 identified the N501Y mutation in 5.5% of screened specimens (1.2% for samples not associated with an outbreak). Given the first reported case of VOC in Ontario dated to late November 2020, **these results indicate the prevalence of specimens with this mutation are increasing**.<sup>6</sup>
- S-gene target failure (SGTF) results from Dynacare labs (i.e. Greater Toronto Area [GTA] largely drawn from Markham, Brampton, Maple and Etobicoke) have demonstrated a consistent and increasing trend since the end of December. **The proportion of specimens with SGTF in these areas of the GTA based on a recent analysis is now approximately 15%**.<sup>7</sup>
- **The data are clear that the prevalence of B.1.1.7 is increasing rapidly. B.1.1.7 is estimated to be the dominant variant in Ontario by the end of February.**
- **To maintain the reproduction number less than 1, measures sufficient to control B.1.1.7 should be implemented in mid-February. Later implementation of measures will lead to a B.1.1.7-associated resurgence.**

## Evidence about Lockdowns and Experience from Other Jurisdictions

Three published PHO environmental scans synthesised best available evidence about lockdowns during the first wave, second wave, and since the emergence of VOC. The findings from each of the PHO reviews are summarized below.

**First wave:** Summary of findings from the environmental scan, *Lockdown' Public Health Measures during the COVID-19 Pandemic*:

- Lockdowns to control the **first wave** were effective to reduce the reproduction number and COVID-19-related hospitalizations rates and deaths when initiated rapidly and with strict measures that reduced population mobility.<sup>8</sup> Impacts of lockdowns begin to be observed by approximately two to three weeks.<sup>8</sup>
- Of the reviewed jurisdictions, only Victoria, Australia reached zero SARS-CoV-2 cases reported after using a strict state-wide lockdown approach (including school closures) that lasted 6 weeks before minor easing of restrictions in metropolitan Melbourne, and greater easing of restrictions in regional areas with low rates of SARS-CoV-2.<sup>8</sup>
- Other jurisdictions reviewed that had shorter lockdowns with faster easing of restrictions have since experienced additional waves of SARS-CoV-2.<sup>1</sup>

**Second wave:** Summary of findings from the environmental scan, “Resurgence of COVID-19, Lockdown Measures and Impact: A Rapid Scan”:<sup>9</sup>

- Multiple international jurisdictions experiencing the **second wave** (COVID-19 resurgence) applied similar lockdown measures as their first wave; lockdown impacts were observed two to three weeks after initiating lockdown measures.
- From a scan of nine jurisdictions, the most common resurgence lockdown measures were: limitations on population mobility and social gatherings, and the closure of bars/restaurants, retail, entertainment venues and recreation facilities. Mandatory face coverings/masks was also a common measure enacted during COVID-19 resurgence.
- All national lockdowns (e.g., England, Australia, France) were preceded by some level of restrictive regional-level measures. The duration of national lockdown measures and approaches for lifting restrictions varied.

**Emergence of VOC:** Summary of findings from the environmental scan, “Lockdown Duration and Re-opening including Considerations for COVID-19 Variants of Concern”:<sup>1</sup>

- Longer duration lockdowns (e.g. 42-60 days) appear to be more effective at reducing COVID-19 cases than shorter interventions.
- A low effective reproduction number and a low incidence of infection (before re-opening) are important to successfully re-open after a lockdown. Commonly reported strategies to mitigate risk for resurgence on re-opening include: physical distancing, testing, isolation of cases, contact tracing and isolation (quarantine), supports for at-risk individuals, and gradual (vs. abrupt) release from lockdown.
- The emergence of variants of concern (VOC) with increased transmissibility and possibly more frequent fatality outcomes across all age groups (e.g., B.1.1.7 lineage, also known as VOC 202012/01, or 20I/501Y.V1) requires that swift and stricter decision thresholds be considered for easing and reinforcing public health measures than would have previously been applied to non-variant strains of COVID-19. A prevention-based strategy maintaining low case numbers has been suggested.
- Three regions (England, Ireland, and Denmark) with VOC have responded with similar national lockdown measures to control transmission and spread of COVID-19 and VOC (measures summarized in Table 1). The epidemiological impact of these lockdowns is described in detail in the recently published PHO report.<sup>1</sup>

In addition, PHO conducted a review of retail reopening during periods of high community transmission.<sup>10</sup> There was limited evidence identified on the impact of specific measures for retail settings. The most evidence available is from population mobility studies and lockdowns involving retail closures or stay-at-home orders. These studies suggest that greater mobility of the population (e.g., travelling to retail locations) is associated with greater risk of COVID-19 transmission.

## Overview of Lockdown Measures Implemented in the VOC Context

Table 1 below summarizes the types of measures England, Ireland, and Denmark implemented in response to VOC. A detailed documentation of these lockdown measures is reported in PHO's recent environmental scan on lockdown duration and reopening including considerations for COVID-19 variants of concern.<sup>1</sup> Prolonged school closures and population mobility restrictions have needed to be enacted. Consideration will need to be given for additional public health measures that will be needed for the Ontario context, beyond what was enacted in the January 2021 Declaration of Emergency, to increase stringency in a swift and decisive manner.

## Equity Considerations

It is acknowledged that prolonged, stringent community-based public health measures, while effective in controlling COVID-19 transmission and the serious morbidity, mortality and health system impacts, involve important harms that are relevant to public health. For example, prolonged school closures have important negative impacts to children and families.<sup>11</sup> In addition, there is evidence that the harms from substance use including opioids has increased during pandemic public health measures.<sup>12</sup> While Ontario is faced with community transmission of VOC and the need for ongoing stringent public health measures, it is important to also implement strategies to mitigate the harms of measures for high-risk populations.<sup>13</sup> For example, approaches to the risks of further in-person schooling disruptions should consider broadening a definition of at-risk children and families who could benefit from additional supports and opportunity for in-person school attendance, such as implemented in England and other countries where measures were enacted in response to VOC.<sup>1</sup>

**Table 1. National lockdown measures implemented in select regions to respond to the emergence of VOC.<sup>1</sup>**

Type of measure	England <sup>14-16</sup>	Ireland <sup>17*</sup>	Denmark <sup>18-22</sup>
Mandatory face coverings/masks	Y	Y	Y
Curfew	N	N	N
Population mobility restrictions	Y	Y	N
School closures (moved education online)	Y**	Y	Y**
Work from home	Y	Y	Y
Closure of non-essential retail settings	Y	Y	Y

Type of measure	England <sup>14-16</sup>	Ireland <sup>17*</sup>	Denmark <sup>18-22</sup>
Closure of bars/restaurants (takeaway only)	Y	Y	Y
Social gatherings limits (in public and private settings)	Y	Y	Y
Religious gatherings limits	Y	Y	Y
Wedding, funeral, and civil ceremony attendance limits	Y	Y	Y
Closure of event, banquet, entertainment venues	Y	Y	Y
Closure of recreation facilities	Y	Y	Y

*\*Corresponds with Ireland's national restriction level five (most restrictive level of their national framework), implemented from December 30 2020 to March 5 2021.*

*\*\* England and Denmark moved all schools online during their lockdowns (initiated January 5, 2021), however vulnerable children permitted to attend school in both countries. In England, children who have a parent or guardian working in a critical sector (e.g., health care, public safety) may also attend school in-person.*

## Conclusions and Recommendations

- Based on the evidence, relatively brief lockdowns with pre-determined end dates (i.e. circuit breakers) have not been effective to manage COVID-19 resurgence. Strict, larger geography lockdowns of at least four weeks duration seem to have the most appreciable impact on COVID-19 rates, with longer duration most effective and required when rates are high, as has been seen with B.1.1.7 in other jurisdictions.
- We currently have evidence that the prevalence of B.1.1.7 is increasing in Ontario, and this occurred during the provincial shutdown. Increased case numbers are expected to be a late signal that will lead to morbidity, mortality and health system impacts due to rapid exponential growth.
- When making decisions about lockdown duration and measures in the context of VOC in Ontario, the evidence and experiences from Europe demonstrate that any current public health measures implemented must be swift and intense (i.e., longer duration of lockdowns, more stringent restrictions) to minimise spread in Ontario communities. Prevention is expected to offer great benefit in minimizing negative impacts on a stressed health system.
- Additional measures beyond the provincial shutdown and stay-at-home order enacted in January 2021 will be needed in Ontario to curb B.1.1.7 growth. Consideration should be given for measures at a higher-level than the PHU level, such as province-wide, given the required national-level lockdowns required in managing B.1.1.7 in other countries.

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