

## EVIDENCE BRIEF

# **(ARCHIVED)** Using COVID-19 Data to Inform Reopening Decision-making in the Context of Variants of Concern

Published: February 2021

Archived: November 2023

---

### ARCHIVED DOCUMENT

This archived content is being made available for historical research and reference purposes only. The content is no longer being updated and it may not reflect current evidence or guidance.

---

## Key Messages

- A stepwise, data-driven approach to guide decisions on when to reduce public health measures (PHM) can facilitate transparency and balance the risks of reopening and related capacity impacts to Ontario's health system in the context of Coronavirus Disease 2019 (COVID-19) Variants of Concern (VOC).
- Establishing a threshold for the effective reproduction rate ( $R_e$ ) significantly below 1 will provide a margin of safety that can be more clearly understood and adjusted as experience with VOC in Ontario is gathered and analyzed.
- Following a stepwise, data-driven approach would result in reopening decision-making beginning after incidence has declined to  $< 10/100,000$ , corresponding to the lowest level (Green – Prevent) of Ontario's COVID-19 Response Framework.<sup>1</sup>
- The approach should be applied at the public health unit level or at a larger regional level, based on context and acknowledgment of cross-jurisdictional transmission risks. It is not recommended for use at geographic levels smaller than public health units.
- Once the three proposed steps are achieved, reducing public health measures and reopening in community settings is recommended to proceed gradually. In the context of evolving

understanding of VOC growth, rapid re-implementation of stringent measures will be critical to achieve control and mitigate morbidity, mortality and health system impacts.

- This approach is based on commonly available epidemiological information. Decision-makers may incorporate other information in reopening decision-making.

## Issue and Research Question

- Increasing COVID-19 incidence (numbers of new cases) in Ontario through early January 2021 significantly impacted Ontario's health system capacity through increased hospitalizations and intensive care unit (ICU) admissions. These negative impacts on the health care system contributed to a second declaration of emergency.<sup>2</sup>
- COVID-19 VOC with evidence of increased transmissibility have been identified in Ontario.<sup>3</sup> These VOC increase risks of accelerating incidence, particularly as some VOC are being transmitted in Ontario communities.<sup>4,5</sup> However, their recent detection in Ontario means data are still evolving and makes quantifying these risks for Ontario challenging at this important time.
- Using available epidemiologic data at Public Health Ontario, this approach considers how data can these be used to guide reopening accounting for what is known (e.g. rates of new cases) and what is unknown (e.g. what is the effect of VOC in Ontario?). The stepwise, data-driven approach could support reopening at low community transmission levels, building on lessons learned in countries that have recently managed exponential VOC growth.<sup>6</sup>

## Methods

- This approach is intended to be stepwise to allow for both sustained reductions in COVID-19 burden and any effects of school reopening. Overall, a major goal is avoiding further school closure or re-implementation of broad, province-wide restrictions.<sup>6</sup>
- The approach (Table 1) includes a margin of safety for VOC effects and reflects that not all parts of Ontario are equally affected by COVID-19. By establishing a threshold for the effective reproduction rate ( $R_e$ ) significantly below 1, this margin of safety can be adjusted as more data regarding Ontario's VOC experience is gathered and analyzed.
- Incidence < 10/100,000, aligns with the Ontario COVID-19 Response Framework.<sup>1</sup> The Framework provides a colour-coded series of levels; <10/100,000 cases classifies an area as Green – Prevent. Due to variability in the data, particularly in public health units (PHUs) with small numbers of cases,  $R_e$  and incidence decline may not always align and thus, the emphasis is on incidence levels as a key factor.
- This framework is based on epidemiological indicators and does not encompass all factors that may be considered in reopening decision-making.
- At this time, vaccination indicators are not recommended as part of a reopening decision-making approach. Coverage remains low and limited evidence regarding vaccine efficacy for emerging VOC combine to recommend deferring inclusion of vaccination as a relevant indicator until vaccine coverage is higher and VOC implications better understood.<sup>7,8</sup>

**Table 1. Using COVID-19 Data to Inform Reopening Decision-making**

Steps	Rationale
STEP 1: Effective Reproduction Rate ( $R_e$ ) < 0.6 - 0.7 for 14 days	VOC reported to be 50-70% more transmissible; consider VOC as factor driving increased $R_e$ $0.6+50\% = 0.9$ , $0.7+50\% = 1.05$
STEP 2: Incidence declining and < 10/100,000	Ontario's COVID-19 Response Framework defines 10/100,000 as upper limit of green zone (Prevent) and aligns with reopening thresholds used in Spring, 2020. <sup>1</sup>
STEP 3: Health system capacity assessment	Occupancy (ICU and COVID-19 non-ICU admissions) declining necessary before reducing restrictions to be able to care for persons who may become infected/sick as restrictions are reduced. Public health system capacity assessed

## Application for Practice

- Tables 2 through 7 apply steps one and two of this approach and group Ontario's PHUs by when the level of COVID-19 new infections is expected to fall below 10/100,000. This example assumes a constant rate of decline in new cases using the rate of decline from the week of January 30 to February 5, 2021. It could be updated weekly as rates of decline may vary over time. It is important to note that:
  - An initial decline below 10/100,000 may not be stable and opting for a sustained decline below 10/100,000 over several weeks would further support prudent reopening.
  - The weekly rate of decline may vary as the effects of school reopening and COVID-19 transmission patterns in neighbouring regions may shift rates of decline.
- PHUs and other decision-makers are encouraged to collaborate to update the findings weekly to guide reopening decisions.
- Consideration for differences in colour-coded framework levels in neighbouring PHUs is important, given potential for cross-PHU mobility and transmission. Re-opening in a green-level PHU adjacent to a PHU with higher COVID-19 incidence may yield higher risks of COVID-19 than opting for a larger geographic region where all included PHUs have achieved similar COVID-19 control based on the elements of the stepwise approach.

- Where adjacent PHUs have significant cross-PHU travel for work or other activities, coordination of reopening across multiple PHUs may be relevant and useful to consider.

With any reopening approach, public release of the results is encouraged along with a schedule for the frequency of updating the results. Since weekly rates of decline may not be constant, weekly updating with updated data increases the validity of predictions based on this approach.

**Table 2. Example Application of the Approach by PHU (PHUs achieving Step 2 as of February 5, 2021)<sup>9,10</sup>**

Health Unit	RATE/100,000, WEEK JAN 30-FEB 5	% CHANGE, WEEK-WEEK	R <sub>e</sub>
Hastings Prince Edward Public Health	2.4	100.0	NA
Kingston, Frontenac and Lennox & Addington Public Health	4.2	0.0	NA
North Bay Parry Sound District Health Unit	4.6	20.0	NA
Renfrew County and District Health Unit	2.8	-25.0	NA
Timiskaming Health Unit	3.1	0.0	NA
Leeds, Grenville & Lanark District Health Unit	8.7	-42.3	1.04

NA: Not available as number of cases too few to calculate effective reproduction rate

**Table 3. Example Application of the Approach by PHU (PHUs expected < 10/100,000 by February 12, 2021)**

Health Unit	RATE/100,000, WEEK JAN 30-FEB 5	% CHANGE, WEEK-WEEK	R <sub>e</sub>
Peterborough Public Health	12.8	-47.2	0.80
Public Health Sudbury & Districts	14.1	-63.6	0.58

**Table 4. Example Application of the Approach by PHU (PHUs expected < 10/100,000 by February 19, 2021)**

Health Unit	RATE/100,000, WEEK JAN 30-FEB 5	% CHANGE, WEEK- WEEK	R <sub>e</sub>
Grey Bruce Health Unit	11.8	-13.0	1.16
Algoma Public Health	12.2	-6.7	1.71
Porcupine Health Unit	31.2	-63.4	0.83

**Table 5. Example Application of the Approach by PHU (PHUs expected < 10/100,000 by February 26, 2021)**

Health Unit	RATE/100,000, WEEK JAN 30-FEB 5	% CHANGE, WEEK- WEEK	R <sub>e</sub>
Huron Perth Public Health	31.5	-38.9	0.61
Ottawa Public Health	31.9	-24.7	0.80
Lambton Public Health	32.8	-38.6	0.69
Eastern Ontario Health Unit	39.3	-38.8	0.74
Wellington-Dufferin-Guelph Public Health	48.1	-51.6	0.75

**Table 6. Example Application of the Approach by PHU (PHUs expected <10/100,000 after March 1, 2021)**

Health Unit	RATE/100,000, WEEK JAN 30-FEB 5	% CHANGE, WEEK- WEEK	R <sub>e</sub>
Niagara Region Public Health	76.2	-40.6	0.68
Windsor-Essex County Health Unit	58.8	-34.2	0.72
Chatham-Kent Public Health	73.4	-32.2	0.96
Middlesex-London Health Unit	38.6	-20.0	0.83
York Region Public Health	72.5	-28.0	0.80
Region of Waterloo Public Health and Emergency Services	59.9	-24.9	0.79
Durham Region Health Department	50.7	-22.5	0.86
Southwestern Public Health	40.7	-18.1	0.84
<b>Ontario</b>	<b>68.4</b>	<b>-22.5</b>	<b>0.88</b>
City of Hamilton Public Health Services	67.0	-20.4	0.78
Simcoe Muskoka District Health Unit	45.2	-15.8	0.99
Brant County Health Unit	32.2	-12.3	0.67
Toronto Public Health	112.0	-20.0	1.01
Peel Public Health	123.7	-17.3	0.86
Haldimand-Norfolk Health Unit	30.7	-7.9	1.00

Health Unit	RATE/100,000, WEEK JAN 30-FEB 5	% CHANGE, WEEK- WEEK	$R_e$
Thunder Bay District Health Unit	63.4	-9.5	0.98

**Table 7. Example Application of the Approach by PHU (PHUs expected <10/100,000 that are unable to predict date due to positive growth rate)**

Health Unit	RATE/100,000, WEEK JAN 30-FEB 5	% CHANGE, WEEK- WEEK	$R_e$
Northwestern Health Unit	19.4	6.3	0.99
Haliburton, Kawartha, Pine Ridge District Health Unit	32.8	17.0	1.02
Halton Region Public Health	62.7	12.8	0.85

## Discussion and Implications

- This approach assumes constant weekly percentage declines in new cases. This is a simplifying assumption. As more data become available, these results should be updated, ideally weekly. For example, should B.1.1.7 VOC become dominant in Ontario as occurred in the United Kingdom,  $R_e$  would rise and the weekly percentage change move closer to zero or potentially be positive, resulting in cases increasing. Increasing numbers of new cases result in increased morbidity and mortality, increasing risks of overwhelming the health care system, and thus requiring timely implementation of stringent public health measures.
- By building an approach to reopening around widely available data, stakeholders may be more engaged in this data-driven approach.
- While this approach establishes a data-driven, stepwise approach to when to consider reopening decisions, it does not specify the content of reopening decisions. Once the thresholds consistent with low rates of community transmission are achieved, decision-makers may consider which public health measures would be eased and how. Experience from other jurisdictions indicates that gradual reopening of settings is more successful in controlling COVID-19 than rapid reopening.<sup>6</sup>
- Geographies larger than individual PHUs may be more suitable for reopening due to travel across PHU borders. Decisions about reopening any region, PHU or larger, bordering a high-

incidence region (i.e. in higher levels of the provincial framework) should consider risks of cross-jurisdictional mobility facilitating COVID-19 transmission.

- The data-driven approach provides guidance for decisions but does not make decisions. Thus, a cluster of VOC cases in a region with a low rate (e.g.  $<10/100,000$ ) might prompt a slowing of reopening or rapid re-implementation of stringent public health measures while the extent of the impact on the community can be assessed.



## References

1. Government of Ontario. COVID-19 response framework: keeping Ontario safe and open [Internet]. Toronto, ON: Queen's Printer for Ontario; 2020 [cited 2021 Feb 10]. Available from: <https://www.ontario.ca/page/covid-19-response-framework-keeping-ontario-safe-and-open>
2. Ontario. Office of the Premier. Ontario declares second provincial emergency to address COVID-19 crisis and save lives [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Jan 29]. Available from: <https://news.ontario.ca/en/release/59922/ontario-declares-second-provincial-emergency-to-address-covid-19-crisis-and-save-lives>
3. Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 UK variant VOC-202012/01 – what we know so far [Internet]. Toronto, ON: Queen's Printer for Ontario; 2020 [cited 2021 Feb 11]. Available from: <https://www.publichealthontario.ca/-/media/documents/ncov/covid-wwksf/2020/12/what-we-know-uk-variant.pdf?la=en>
4. Ontario Agency for Health Protection and Promotion (Public Health Ontario). SARS-CoV-2 variants of concern: results of point prevalence study [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Feb 11]. Available from: <https://www.publichealthontario.ca/-/media/documents/ncov/voc/02/sars-cov-2-variants-point-prevalence.pdf?la=en>
5. Phillips K. Simcoe Muskoka reports 19 COVID-19 variant cases and 126 possible cases. CTV News [Internet], 2021 Feb 01 [cited 2021 Feb 10]; Barrie. Available from: <https://barrie.ctvnews.ca/simcoe-muskoka-reports-19-covid-19-variant-cases-and-126-possible-cases-1.5291008>
6. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Lockdown duration and reopening including considerations for COVID-19 variants of concern [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Feb 11]. Available from: <https://www.publichealthontario.ca/-/media/documents/ncov/phm/02/covid-19-environmental-scan-lockdowns-reopening-considerations-voc.pdf?la=en>
7. Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 B.1.351 (501Y.V2) variant of concern – what we know so far [forthcoming]. Toronto, ON: Queen's Printer for Ontario; 2021.
8. Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 – What we know so far about... herd immunity [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Feb 11]. Available from: <https://www.publichealthontario.ca/-/media/documents/ncov/covid-wwksf/2021/02/wwksf-herd-immunity.pdf?la=en>
9. Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 regional incidence and time to case notification in Ontario [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Feb 11]. Available from: <https://www.publichealthontario.ca/-/media/documents/ncov/epi/covid-19-regional-epi-summary-report.pdf?la=en>
10. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Trends of COVID-19 incidence in Ontario [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Feb 11]. Available from: <https://www.publichealthontario.ca/-/media/documents/ncov/epi/covid-19-epi-trends-incidence-ontario.pdf?la=en>

## Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Using COVID-19 data to inform reopening decision-making in the context of variants of concern. Toronto, ON: Queen's Printer for Ontario; 2021.

©Queen's Printer for Ontario, 2021

## Disclaimer

This document was developed by Public Health Ontario (PHO). PHO provides scientific and technical advice to Ontario's government, public health organizations and health care providers. PHO's work is guided by the current best available evidence at the time of publication.

The application and use of this document is the responsibility of the user. PHO assumes no liability resulting from any such application or use.

This document may be reproduced without permission for non-commercial purposes only and provided that appropriate credit is given to PHO. No changes and/or modifications may be made to this document without express written permission from PHO.

## Public Health Ontario

Public Health Ontario is an agency of the Government of Ontario dedicated to protecting and promoting the health of all Ontarians and reducing inequities in health. Public Health Ontario links public health practitioners, front-line health workers and researchers to the best scientific intelligence and knowledge from around the world.

For more information about PHO, visit [publichealthontario.ca](https://publichealthontario.ca).

