

FEDERAL/PROVINCIAL/ TERRITORIAL PUBLIC HEALTH RESPONSE PLAN FOR ONGOING MANAGEMENT OF COVID-19

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Executive Summary

This Federal/Provincial/Territorial plan developed in collaboration with federal, provincial and territorial public health officials, Indigenous partners, and health system partners, for these and other stakeholders, provides a common forward planning approach for ongoing management of COVID-19 in Canada. The plan acknowledges jurisdictional roles and responsibilities, identifies when national approaches are anticipated and when provincial/territorial flexibility and customization are expected.

Key elements of the plan include:

- a goal statement,
- public health response objectives,
- planning assumptions,
- a reasonable worst case scenario, and
- summaries of current and planned response activities for each main component of the public health response (i.e., Surveillance, Laboratory Response Activities, Public Health Measures, Infection Prevention and Control and Clinical Care Guidance, Vaccination, International Border and Travel Health Measures, Health Care System Infrastructure, Risk Communications and Outreach, and Research).

There is also content specifically addressing planning with Indigenous Communities, planning for high-risk settings and populations, and the role of modelling in the response. Much like other technical guidance, this document may require updating as our scientific knowledge of the SARS-CoV-2 pathogen increases, the epidemiological picture evolves in Canada and globally, epidemic control measures change, and new medical countermeasures become available (e.g., a vaccine, effective treatment).

The pandemic response goal is to minimize serious illness and overall deaths while minimizing societal disruption as a result of the COVID-19 pandemic. The COVID-19 response has been unprecedented with the swift implementation and public adoption of public health measures. While these measures have been successful in reducing the incidence of COVID-19 in Canada, the restrictive nature of many of these measures have had some negative health, well-being and societal consequences. Many of these consequences have disproportionately affected specific segments of the Canadian population. The goal statement and objectives reflect the need to respond in a way that achieves a better balance between minimizing the impact on morbidity and mortality with the impact on societal disruption in order to support a long-term, sustainable response.

To facilitate a common approach and appropriate level of preparedness across Canada, the plan includes a list of planning assumptions, a “reasonable worst case scenario”, and a list of capabilities and requirements needed to mitigate this scenario. The scenario is not the most likely scenario, rather, it provides a baseline to guide consideration of key capabilities, capacity issues, and identification of resource needs that will help focus planning activities. It is provided as a “stress-test”, not a prediction, and is intended to stimulate thinking concerning our current response efforts, capacity thresholds and resiliency. The reasonable worst case scenario includes an epidemic curve with a large peak in the fall or winter of 2020 followed by ongoing peaks and valleys for the next 2-3 years, with all peaks in incidence

creating a demand for resources that exceeds system capacity. It does not account for a widespread vaccine program or availability of an effective treatment.

The capabilities needed to mitigate this scenario, and for the ongoing management of COVID-19 in general, include the ability to:

- detect signals indicating a significant surge in cases may occur,
- prevent a large peak in the fall that greatly exceeds Canada's capacity to respond,
- reduce surges in incidence and hospitalizations,
- increase health care and public health capacity,
- monitor demand for health care resources, and
- foster ongoing public vigilance and compliance with measures and recommendations.

This plan, in conjunction with other foundational federal/provincial/territorial response plans, provides public health leaders with a coordinated approach to: address common issues, and to support the provincial/territorial responses to COVID-19 in the Canadian population. It includes information regarding the current focus of the public health response and anticipated needs for the short, mid and long term ongoing management of COVID-19, which will facilitate awareness and coordination both within and beyond the public health sector.

1. Purpose

The purpose of the *Federal/Provincial/Territorial Public Health Response Plan for Ongoing Management of COVID-19*, is to provide federal, provincial and territorial public health officials, Indigenous partners, health system partners and other stakeholders with a common forward planning approach for ongoing management of COVID-19 in Canada. This plan promotes a long-term approach that covers immediate planning imperatives for the fall/winter 2020 period and thereafter until population herd immunity in one form or another is sufficient to bring the pandemic activity in Canada to an end. This is an evergreen document that may require updating as our scientific knowledge of the SARS-CoV-2 pathogen increases, the epidemiological picture evolves in Canada and globally, epidemic control measures change, and new medical countermeasures become available (e.g., a vaccine, effective treatment).

Building on the ongoing public health response, this document identifies federal/provincial/territorial (F/P/T) public health preparations that are needed and already underway for the short, mid and long-term management of COVID-19 in Canada. It provides overarching guidance that is informed by existing intergovernmental pandemic preparedness, public health emergency planning and data, information and resource sharing agreements, arrangements and protocols (see *Appendix 1*) and draws extensively on the [Canadian Pandemic Influenza Preparedness Guidance](#) (CPIP). The CPIP stipulates that while it is a guidance document for pandemic influenza, much of its guidance is also applicable to other public health emergencies, which has been the case for the COVID-19 response. It is assumed that an ongoing (but appropriately scaled) F/P/T coordinated response structure and activities as outlined in the [F/P/T Public Health Response Plan for Biological Events](#) (F/P/T PHRPBE), will be needed for the foreseeable future.

To facilitate a common approach and appropriate level of preparedness across Canada, this plan includes a “reasonable worst case scenario.” While this scenario is not necessarily the most likely scenario, it provides a baseline to guide consideration of key capabilities, capacity issues, and identification of resource needs that will help focus planning activities. As with other F/P/T plans, this document outlines overarching goals and objectives, acknowledges jurisdictional roles and responsibilities, identifies when national approaches are anticipated and when provincial/territorial (P/T) flexibility and customization are expected. This document has been developed to facilitate planning for an ongoing COVID-19 response that is not only flexible and adaptive but also sustainable.

2. Context

COVID-19 represents an unprecedented threat to the health, social and economic well-being of Canadians, Canadian society and the global community. On January 30, 2020 the Director General of the World Health Organization (WHO) determined that COVID-19 constituted a Public Health Emergency of International Concern (PHEIC) and declared it a pandemic on March 11, 2020, due to extensive international spread. Mitigating the impact of COVID-19 in Canada requires a comprehensive, integrated and cross-sectoral “whole-of society”, “whole-of-government” strategy that focuses on what is within the span of control of our country while trying to reduce the risk of what is not. The context of our planning, therefore, is primarily Canadian-centric but recognizes that the global situation will have a significant effect on response activities.

Mobilizing Canada's health sector response to COVID-19 remains a critical part of that overall effort. This plan and its more detailed components that are described herein, draws heavily on the experience acquired and the work completed during the response to the introduction and subsequent first wave of COVID-19 in Canada. While Canada's F/P/T public health officials have conducted pandemic planning for years, plans must be customized and supplemented as the pandemic unfolds, as each pandemic is different. Despite the incredible effort and pace of COVID-19 response in Canada to date, we are still operating from a place of significant unknowns and need to continue learning and adapting as we move ahead with planning activities.

While the pandemic has affected Canadians in diverse ways, Canadians have not experienced these impacts equally. Emerging evidence indicates that social determinants of health, including low-income status, adverse physical environments, precarious housing, and race/ethnicity, among others, correlate with increased risk of COVID-19 infection.¹ Data show that compared to men, women in Canada have experienced higher rates of COVID-19-related fatalities, and job losses have been higher for women, with recent recoveries in the workforce disproportionately benefitting men.^{2,3} As a result of the economic downturn triggered by the pandemic, visible minorities have been particularly affected, with a larger share reporting having difficulties meeting their financial obligations or essential needs compared to White workers.⁴ Similarly, Indigenous Peoples, persons living with disabilities, and LGBTQ2IA+ communities, among others, have been disproportionately affected by the pandemic.⁵

Furthermore, some populations have been particularly impacted by the measures implemented to control the pandemic; for example, the unprecedented extent and duration of school closures which may have long-term effects on child development, health and education^{6,7}. As efforts shift towards the next phase of the response, it is imperative that the needs of diverse groups of Canadians are carefully considered in order to mitigate adverse consequences and reduce both known and reasonably anticipated inequities.

3. COVID-19 Response Goal, Objectives and Response to Date

3.1 Goal

Canada's goal for responding to COVID-19 is based on that established for pandemic influenza in the *Canadian Pandemic Influenza Preparedness: Planning Guidance for the Health Sector* document (last updated August 2018). The goal is:

- To minimize serious illness and overall deaths while minimizing societal disruption as a result of the COVID-19 pandemic.

This goal has guided F/P/T actions and has helped reduce the incidence of COVID-19 in Canada (i.e., flattening of the initial epidemic curve) and associated serious illness and deaths. Reducing the health impact of COVID-19 in the absence of a vaccine or effective treatment while minimizing societal disruption has been extremely challenging. The pandemic circumstances, not only in Canada but globally, have led to the extraordinary implementation of broad, restrictive community-based public health measures and the need to offer an unparalleled level of societal support measures (e.g., income support, housing support, and expansion of social services such as mental health and food assistance).

When the original CPIP pandemic goal was developed it was thought that the main cause of societal disruption would be the absence of essential workers (including health care providers) from the workplace due to illness, need to care for ill family members, workplace outbreak control measures and/or refusals to work. The closure of international borders, businesses, schools and restrictions on social gatherings was always acknowledged as a potential source of societal disruption in a severe pandemic. The COVID-19 response has been unprecedented with the swift implementation and public adoption of public health measures (PHM). The restrictive measures that have averted widespread essential service disruption due to illness have, however, had significant broader direct and indirect impacts on health and wellbeing.

3.2 Objectives

As the focus of planning now shifts to a long-term sustainable response it is time to examine how to strike an optimal balance between minimizing both health impacts and societal disruption. The following public health objectives aim to achieve this balance.

Objectives

To mitigate both health and societal impacts of the pandemic by:

- Taking public health action to reduce the incidence, morbidity or mortality of COVID-19 to a locally manageable level;
- Protecting high-risk populations and communities, including Indigenous communities;
- Reducing negative physical and mental health consequences of COVID-19 response actions;
- Taking a risk and evidence based approach to the use of restrictive public health measures;
- Supporting access to health care services (both COVID-19 and non-COVID-19 related services), supplies and treatment options;
- Leveraging Canada's research, surveillance and laboratory systems;
- Working with other sectors to strengthen the social and economic services and policies that protect health and prevent disease (e.g., adequate housing, employment and income supports); and
- Working collaboratively with the international community.

3.3 Response to date

F/P/T response actions to date have been comprehensive and have gone a long way toward achieving these national public health objectives. These actions include but are not limited to:

- rapid case identification, confirmation, and isolation for the period of communicability;
- rapid contact tracing, identification, communication and quarantine of contacts for the duration of the incubation period;
- supporting evidence-informed decision-making by collecting, analyzing and sharing surveillance and other scientific information to inform and target interventions;
- rapid outbreak identification and containment activities;
- preventing the importation of COVID-19 through border and travel restrictions;
- reducing the spread of infection through consistent and frequent communication to the public to promote the importance of individual, family, community and organizational mitigation strategies and PHM;
- promoting modifications to day-to-day activities to reduce transmission of COVID-19 in community settings as much as possible;

- protecting those most at risk of serious illness through the provision of resources, guidance and public messaging;
- protecting those most at risk of serious illness in congregate settings and health-care facilities through targeted communications, guidance and response actions;
- establishing a protective stance through community-level screening, guidance and quarantine measures for Northern/remote/isolated communities, and Indigenous populations;
- supporting community-level health and social interventions aimed at supporting and protecting populations at high risk and mitigating negative impacts of public health interventions;
- providing guidance to public health partners, health care delivery stakeholders, and non-health sectors/settings that facilitates an evidence-informed, risk-based approach;
- facilitating rapid access to health care supplies, equipment and resources, including medical evacuation from remote, isolated and under-serviced communities;
- supporting the continuity of health care and other essential services;
- providing additional mental health resources and social services; and
- facilitating a gradual, cautious return to community functioning in the context of ongoing COVID-19 activity.

Maintaining the trust and confidence of Canadians through timely and transparent communication of evidence-informed public health decisions; communicating appropriate and timely advice (including changes to this advice) to decision-makers, health professionals and the public; taking into consideration the diverse needs of population groups based on vulnerability, ethnicity/culture, ability status, and other socioeconomic and demographic factors; and supporting a coordinated response by working collaboratively with all orders of government and stakeholders, continue to be essential in this ongoing response. We need to prepare the public for the reality of living with COVID for the foreseeable future and the changes that will come in next 2 to 3 years by which time we hope to have widespread access to vaccines, effective treatment and increasing levels of herd immunity.

In order to achieve the response goal and objectives it is essential that the effectiveness of COVID-19 control measures be assessed against any negative effects of implementation of these measures (including the re-allocation of other public health program resources); with the objective of reducing COVID-19 incidence to a locally manageable level in mind. This is key to a sustainable long-term response.

Public health officials are prepared to respond to the variety of challenges that the management of COVID-19 will involve as the pandemic continues to unfold. Advice, recommended measures and interventions have been made based on these shared pandemic goals and objectives. As our collective knowledge increases, these objectives will be revisited and updated as needed.

4. Forward Planning: Assumptions and Epidemiological Drivers

This plan aims to support consistent but flexible public health planning at all levels of government in order to prepare for short, mid and long-term COVID-19 response activities. Plans should reflect a combination of nationally agreed upon approaches with regionally and locally adaptable actions and be aligned with the pandemic response goals and objectives, taking into account the needs of diverse

groups of Canadians on the basis of health status, age, gender, ethnicity/culture, ability status, and other socio-economic and demographic factors.

Table 1 identifies general planning assumptions that aim to provide a common basis for planning in the Canadian context for the next several months to years. The areas of uncertainty, listed in the table, help identify current unknowns. Given these areas of evolving evidence and knowledge, plans need to include flexible elements or placeholders that can be updated as the pandemic progresses and knowledge and experience increase. Both planning assumptions and areas of uncertainty require validation and/or updating and may be triggers for re-visiting and modifying plans.

Table 1: Summary of planning assumptions and areas of uncertainty

General planning assumptions
<ul style="list-style-type: none"> • Compared to influenza, COVID-19 has higher transmissibility (i.e. it has a higher basic reproductive number or R_0) is highly transmissible prior to symptom onset, and has a higher infection fatality rate. • Transmission by asymptomatic cases is occurring. • The pandemic likely won't be halted by "herd immunity" until $\geq 60\%$ of the population is immune (through natural infection or vaccination). • Immunity (from natural infection or vaccination) may not be strong or long-lasting. • A vaccine will not be widely available in the short term or mid term (i.e., before 2021). • Once a safe and efficacious vaccine is available it will be rolled out in a targeted manner. • There will be a national approach to prioritization/targeting of any limited resource which will be based on an ethics framework. Policy development around prioritizing limited resources will also be informed by other logistical, epidemiological and societal considerations, for example the Declaration of the Rights of Indigenous Peoples. • The national epidemic curve will be a compilation of the epidemic activity in each province and territory, which will be influenced by the locally implemented public health response measures and public adherence to and compliance with these measures. • The risk of imported cases sparking localized outbreaks is ongoing. • International borders will be open over time with corresponding increases in travel (during the period covered by this plan). • Response measures implemented in one jurisdiction could have an impact on neighbouring jurisdictions, even if they themselves do not implement that measure. • The level of response across Canada will vary based on local epidemiology (e.g., could be surging in multiple jurisdictions at same time, different times or lulls could coincide).

- Our health care system and public health system capacity has limits which could be breached during peaks of COVID-19 activity.
- Effects of concurrent circulation of influenza and other respiratory viruses will be additive, on health care (including long-term and other community care) and public health system capacity during the fall-winter period but potentially lower than usual seasonal increases due to the effect of COVID-19 public health and infection prevention and control measures.
- High uptake of an effective (i.e., well matched) seasonal influenza vaccine amongst those at high-risk of influenza complications will mitigate the demand for hospital resources during the influenza season. High vaccine coverage in the general population may also indirectly mitigate demand by reducing transmission of influenza to high-risk individuals.
- Public health capacity to respond to other priorities (e.g., the overdose crisis and higher rates of problematic substance use) needs to be maintained. Capacity to catch-up on interrupted program delivery may also be required.

Areas of uncertainty

- Whether there will be a change in COVID-19 severity, risk groups, transmission patterns/dynamics in the short, medium or long term (e.g., due to viral mutation).
- Duration of natural immunity (i.e., recovered cases), what constitutes immunity, and whether infection with other coronaviruses provides cross-protection.
- Whether COVID-19 will eventually have a seasonal pattern similar to other respiratory infections.
- Whether restrictive community PHM could successfully be implemented again, to what degree, duration, how consistently and at what level (e.g., P/T vs regionally vs locally).
- How potential variations in risk tolerance over time and in different geographic areas will impact response actions.
- Whether significant rates of co-infection with SARS-CoV-2 and a seasonal influenza virus or other respiratory pathogen will occur and whether co-infection will significantly impact morbidity or mortality cases and subsequently demand on the health care system and resources.
- Whether recommendations for early/lower thresholds for influenza antiviral treatment will significantly reduce influenza-associated hospitalizations.
- Robustness of international COVID-19 data and testing.

Three potential epidemic curve patterns (see *Figure 1*) have been proposed by modellers, epidemiologists and other experts for planning purposes⁸:

1. **Peaks and Valleys:** The initial wave of COVID-19 in spring 2020 is followed by a series of repetitive similar or smaller waves that occur through the summer and then consistently over a 1- to 2-year period, gradually diminishing sometime in 2021.
2. **Fall Peak:** The initial wave of COVID-19 in spring 2020 is followed by a larger wave in the fall or winter of 2020 and one or more smaller subsequent waves in 2021.
3. **Slow Burn:** The initial wave of COVID-19 in spring 2020 is followed by a “slow burn” of ongoing transmission and case occurrence, but without a clear wave pattern.

The slow burn scenario is our aim as it is most likely to keep incidence, morbidity and mortality at a locally manageable level.

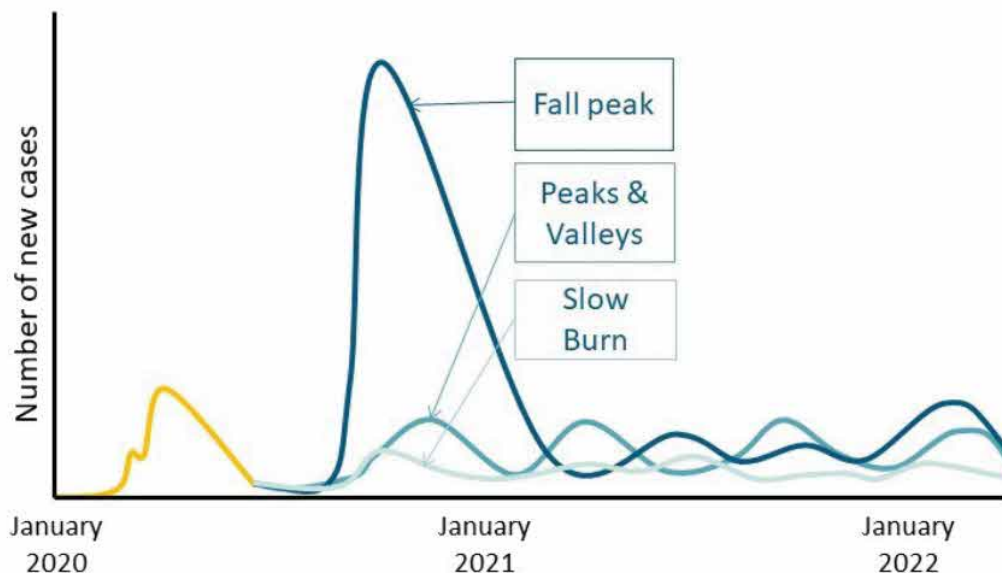
Figure 1: Potential Epidemic curve Patterns

Figure 1 – Text Description

This figure is a graph that has an X-axis (horizontal) with 3 points in time: January 2020, January 2021 and January 2022 and a Y-axis (vertical) that does not have a scale but represents the number of new cases of COVID-19; together these frame a general epidemic curve. The curve starts with an orange line depicting the initial wave of COVID-19 cases in Canada, specifically starting with zero cases at the start of January 2020 followed by a relatively steady increase in new cases over time, peaking in April 2020, then followed by a more gradual decrease to July 2020. The rest of the graph includes 3 lines (in shades of blue) that pick up where the orange line left off (corresponding to July 2020). These 3 lines depict the 3 potential epidemic curve patterns described in the text prior to the figure. In accordance with the text these lines are labelled: “Fall peak”, “Peaks and Valleys” and “Slow Burn”. All 3 potential epidemic curve patterns end just after the X-axis point for January 2022, roughly corresponding to March 2022.

These patterns assume different levels of ongoing or temporarily imposed mitigation measures and does not include a scenario where there is an absence of public health measures. They do not account for a widespread vaccine program with good uptake.

Modelling and capacity assessments facilitate appropriate planning by exploring how possible ranges of parameters relevant to these issues affect the extent and impact of the epidemic. Forecasting models are best suited to inform what may occur in the coming 2-3 months; therefore the role of modelling in long-term planning is focused on providing additional information to decision makers regarding the potential impact of control measures as opposed to the incidence rate itself.

Mathematical modelling supports planning our response to epidemics and outbreaks, and the COVID-19 epidemic has demonstrated the important role and need for the full range of modelling tools required

to support decision-making during a complex public health crisis. This role and the types of models currently in use are described in *Appendix 2: Modelling Support for Forward Planning*.

It is important to recognize that the national epidemic curve will likely be a combination of the epidemic curve patterns from each province and territory, which in turn will be dependent on the effect of the escalation and suppression drivers in each jurisdiction. *Figure 2* identifies epidemiological drivers that will influence the number and timing of new cases and therefore the epidemic curve “wave pattern” we experience in Canada going forward.

Figure 2: Epidemiological Drivers

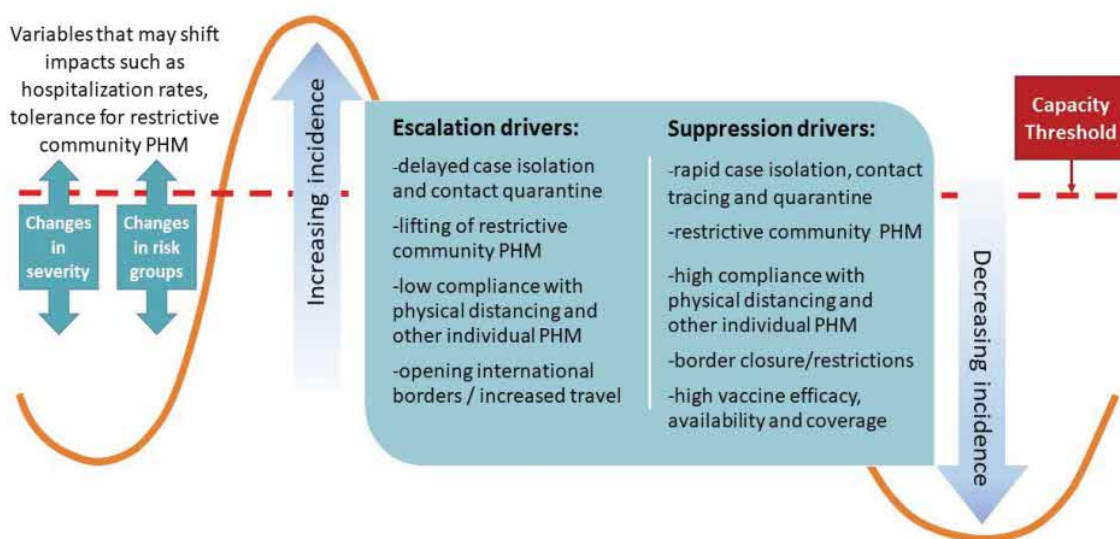


Figure 2 –Text Description

This graphic visually conveys how epidemiological drivers influence incidence of COVID-19 and thereby the epidemic curve pattern (depicted by an orange line that arcs up and then down). The escalation drivers (that would lead to more new cases and depicted by an upward blue arrow that includes the text “Increasing incidence” and points to the upward arc) are listed in a text box as: delayed case isolation and contact quarantine, lifting of restrictive community public health measures, low compliance with physical distancing and other individual public health measures, and the opening of international borders/increased travel. The suppression drivers (that would lead to less new cases and thus depicted by a downward blue arrow that includes the text “Decreasing incidence” and points to the downward arc) are listed as: rapid case isolation and contact tracing and quarantine, restrictive community public health measures, high compliance with physical distancing and other individual public health measures, border closure/restrictions, and high vaccine effectiveness, availability and coverage. Also included in this graphic is the concept of “Capacity Threshold” which conveys the idea of an upper response capacity limit that could be breached by a high number of cases occurring over a short period of time. This is depicted with a horizontal red dashed line that crosses the upward arcing orange line (that suggests an epidemic curve pattern where the number of new cases is peaking). Finally variables that may shift impacts, such as hospitalization rates, tolerance for restrictive community public health measures, are broadly grouped as “changes in severity” and “changes in risk groups” in two text boxes with both up and down arrows coming off of the boxes to highlight that these variables may impact the response capacity threshold.

An epidemic curve pattern is one part of a planning scenario as it reflects the potential changes in the number of new cases occurring over a period of time. To ensure optimal planning it is important to consider not only the number of cases but variables that may shift the health and societal impacts of those new cases (as depicted on the left side of Figure 2) and subsequently possible surges that exceed current health care and public health capacity thresholds. These variables include but are not limited to: changes in severity of illness experienced by the majority of cases, changes in high-risk groups (i.e., both the demographic characteristics of who is getting severely ill and identification of new risk factors for severe illness), availability of an effective treatment and/or vaccine, duration of naturally acquired immunity and concurrent demands on the health and public health system that affect capacity to manage new cases. The manifestation of these variables will also influence public risk perception and therefore, in a somewhat circular manner, epidemiological drivers like compliance with PHM.

5. Reasonable Worst Case Scenario

To facilitate planning in the context of a high degree of uncertainty and the numerous possible scenarios, a “reasonable worst case scenario” has been developed. It is based on a combination of the previously described “Fall peak” and “Peaks and Valleys” epidemic curve patterns. See *Figure 3*. This scenario should not be considered a prediction or even highly likely, but rather a common set of characteristics that will support robust forward planning (see text box).

Figure 3: Epidemic curve for reasonable worst case scenario

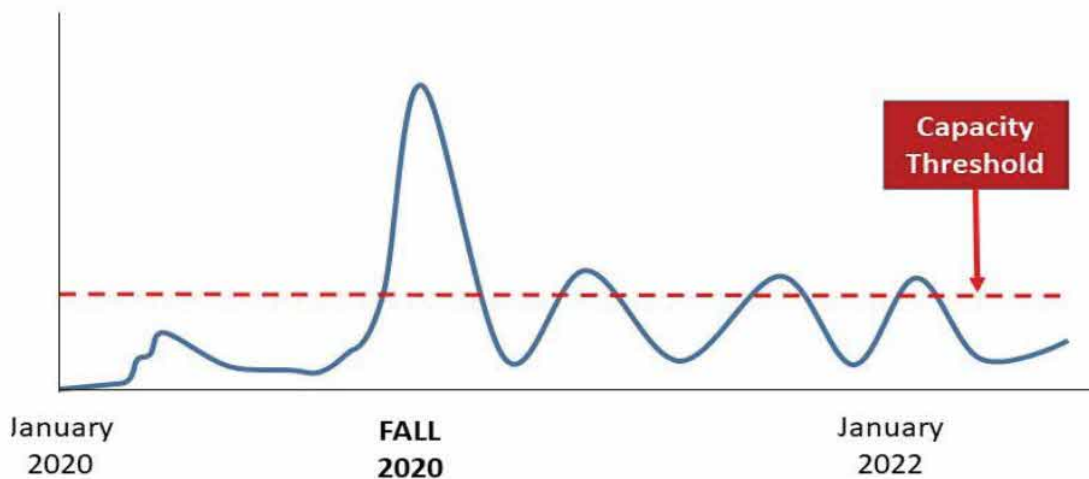


Figure 3 – Text Description

This figure is a graph that has an X-axis (horizontal) with 3 points in time: January 2020, Fall 2020 and January 2022 and a Y-axis (vertical) that does not have a scale but represents the number of new cases of COVID-19; together these frame a general epidemic curve. The epidemic curve pattern for the reasonable worst case scenario (which is a combination of the “Fall Peak” and “Peaks and Valleys” scenarios previously described in the text) is depicted with a blue line that undulates horizontally across the graph. The line depicts the initial wave of COVID-19 cases in Canada, specifically starting with zero cases at the start of January 2020 followed by a relatively steady increase in new cases over time, peaking in April 2020, then followed by a more gradual decrease to July 2020. The line stays relatively flat then heads upwards to form a peak that corresponds with the Fall 2020 time frame and is 2 to 3 times higher than the initial wave. This peak is followed by a relatively sharp decline to complete the image of a large Fall wave. The line then continues in a peak and valley pattern through to its conclusion corresponding to the Spring 2022 time frame. Also included in this graphic is the concept of “Capacity Threshold” which conveys the idea of an upper response capacity limit that could be breached by a high number of cases occurring over a short period of time. This is depicted with a horizontal red dashed line. In this epidemic curve for the reasonable worst case scenario, the peaks in the curve all cross over the capacity threshold line – depicting the situation where the surge in cases results in increased response capacity demands that exceed the capacity threshold.

Reasonable worst case scenario characteristics:

- Epidemic curve with a large fall 2020 peak followed by ongoing peaks and valleys for the next 2-3 years
- Fall/winter peak occurs in 2020 and is 2-3 times higher than the incidence experienced at the peak of the initial wave, with corresponding increases in mortality. (Note: the amplitude of the fall peak at the PT or regional level in this scenario will be influenced by the incidence experienced at the peak of the initial wave.)
- Demand for health care resources (hospitalizations, ICU beds, ventilators, personal protective equipment, Long-term care spaces, etc.) exceeds system capacity (during all peaks)
- Shortage of health care providers (e.g., due to illness, burnout, work refusal, international competition)
- Demands on both laboratory and public health resources exceed capacity (during all peaks)
- COVID-19 peaks occur concurrently with severe influenza/other respiratory pathogens season
- Similar timing of peaks across the country (each jurisdiction experiences peaks at same time)
- Low level of compliance with public health measures
- Permeation of mis/disinformation in Canadian society
- Weak/non-sustained post-infection immunity (recovered cases can become susceptible again)
- No effective widely available treatment
- No effective vaccine available

Nationally the incidence was approximately 31/100,000 population or 11,849 new cases reported during the peak week in the initial wave. There was a high degree of variation between PTs with the most populous PTs having the greatest impact on the national epidemic curve. The reasonable worst case scenario should include planning for a fall or winter peak of 2-3 times the amplitude of the initial wave in PTs or regions that experienced a high peak in incidence during the initial wave and up to 100 times the peak incidence in areas that had lower incidence in the initial wave.

This reasonable worst case scenario can be used to identify any new or outstanding preparedness and response needs or issues that would require, or benefit from, a coordinated F/P/T effort should Canada be faced with this scenario. It is provided as a “stress-test” not a prediction and is intended to stimulate thinking concerning our current response efforts, capacity thresholds and resiliency.

More specifically, the scenario presents a set of potential risks, each requiring mitigation strategies based on an assessment of capacity requirements and our collective capability to manage the risks. *Figure 4* identifies high-level capabilities that need to be in place for this scenario and *Table 2* identifies associated requirements that should be considered at all levels of government.

Figure 4: Capabilities for management of the reasonable worst case scenario

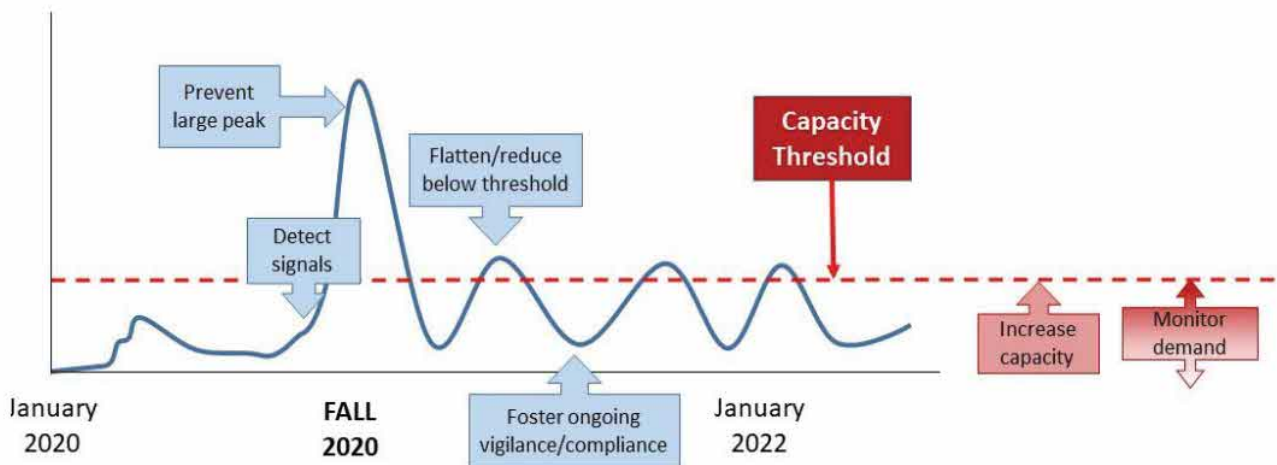
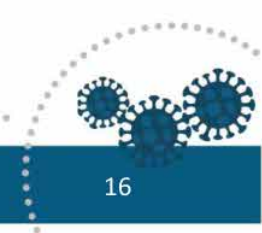


Figure 4 – Text Description

This figure is the same as Figure 3 but includes text boxes that identify capabilities needed for the management of the reasonable worst case scenario. Several of the text boxes have arrows that point to locations on the curve pattern where it is particularly important that the capacity be in place, however the intention is that these capacities are needed on an ongoing basis throughout the response. Also included in this graphic is the concept of “Capacity Threshold” which conveys the idea of an upper response capacity limit that could be breached by a high number of cases occurring over a short period of time. This is depicted with a horizontal red dashed line. In this epidemic curve for the reasonable worst case scenario, the peaks in the curve all cross over the capacity threshold line – depicting the situation where the surge in cases results in increased response capacity demands that exceed the capacity threshold. There are two red shaded text boxes that highlight the need to increase response capacity and to monitor demand. There are four text boxes, that point to the epidemic curve. The first includes the text “Detect signals” and points to the epidemic curve (depicted by a blue line), right before a surge in the number of new cases (depicted by an upswing and peak in curve) corresponding with a large Fall 2020 wave. The next text box includes the text “Prevent large peak” and points to the epidemic curve right where the large Fall 2020 peak is depicted. Where a subsequent peak (smaller in amplitude to the Fall 2020 wave) occurs and crosses the capacity threshold line, a text box indicates the need for capacities aimed at reducing demands caused by the peak in cases with the text “Flatten/reduce below threshold” included in the box. Finally in a “valley” in the peaks and valleys epidemic curve portion of the reasonable worst case scenario epidemic curve, there is a text box indicating the ongoing need to “Foster ongoing vigilance/compliance” particularly when new case numbers seem to be low or decreasing.

Table 2: Reasonable worst case scenario risk management requirements

Capability	Risk Management Requirements
<i>DETECT –signals indicating a significant surge in cases may occur</i>	<ul style="list-style-type: none"> ➤ timely surveillance data (local, P/T, national and international) ➤ laboratory resources to rapidly distinguish between COVID-19 and other respiratory viruses ➤ rapid analysis/investigation to assess risk of large peak (exceeding response capacity), based on precise/granular local level data ➤ early warning for increased demand on resources and response activities ➤ rapid resource allocation to reduce and/or manage impacts ➤ pro-active risk communication ➤ ongoing vigilance/commitment to COVID-19 response
<i>PREVENT –large fall peak that greatly exceeds capacity to respond</i>	<ul style="list-style-type: none"> ➤ resources to ensure ongoing response measures are adequate to control current spread and prevent new cases ➤ public cooperation with surveillance and case and contact management activities (i.e., to facilitate timely identification and isolation/quarantine) ➤ consistent, clear localized triggers for re-implementation of restrictive PHM ➤ rapid deployment of targeted outbreak control/containment resources (including implementation of local “lockdowns”) ➤ gradual, controlled “re-opening” of settings and gradual resumption of activities (with modifications) that are known to be associated with increased transmission risk ➤ high compliance with ongoing modifications/controls put in place as restrictive PHM are lifted ➤ high compliance with personal protective measures ➤ proactive international border control measures ➤ increased messaging and public education regarding personal protective measures as more social interactions move back indoors in the fall season ➤ increased health care system capacity (especially in high-risk settings such as long-term care) and consideration of how to deliver needed health care (e.g., at alternate sites, using retired workers or students or alternate care providers)
<i>REDUCE –surges in incidence and hospitalizations</i>	<ul style="list-style-type: none"> ➤ adequate resources to ensure ongoing response measures to control current spread and prevent new cases, hospitalizations and deaths ➤ focus on rapid detection and isolation of cases, and rapid identification and quarantine of contacts ➤ rapid detection of outbreaks and deployment of outbreak control/containment resources ➤ consideration of how to re-implement restrictive community PHM and which PHM to re-implement based on clear local-level triggers ➤ increased use of/compliance with, personal protective measures ➤ ongoing international border control measures with possible re-introduction of restrictions



INCREASE—health care and public health capacity

- laboratory surge capacity to ensure rapid diagnosis and case notification
- availability of public health resources for surges in case and contact management requirements in the community (including isolation of cases and quarantine of contacts at home/alternative designated sites), development of new guidance products and provision of expert advice based on evolving scientific literature
- resources (i.e., human and equipment/supplies), planning and training for outbreak control activities in high-risk settings, including clear emergency back-up contact points
- surge capacity to ensure availability/access to health care resources including equipment (e.g., ventilators, personal protective equipment) during peaks
- availability of sufficient health care providers to meet surge in demand
- ability to access and distribute effective pharmaceutical treatments
- ongoing monitoring of scientific literature, networks and expert advice to inform best practices for treatment and identification of effective pharmaceuticals that reduce hospitalization requirements and/or duration of hospitalization
- recovery policies and measures (e.g., discharge for recovery at home or alternate site) to avert potential backlogs in the hospital system

MONITOR—demand for health care resources

- surveillance for early indicators that other illnesses that may cause a surge in demand for health care resources (e.g., seasonal influenza, other respiratory pathogens)
- linkages between health care delivery and public health to ensure timely establishment of alternative/over-flow care sites
- enhanced monitoring of global supply chains that could trigger drug shortages and identified alternatives and strategies to prioritize and conserve supply (e.g., critical supply reserve etc.)

FOSTER—ongoing public vigilance and compliance with measures and recommendations

- ongoing public trust in public health authorities
- communication and education products to support continued widespread public adherence to personal protective measures and community-based public health measure
- public knowledge, attitudes and behavior research to inform sustainable effective behavioral changes

6. COVID-19 F/P/T Response Components

Forward planning will also be informed by ongoing reflection regarding what has worked well, what we have learned and what we can be adjusted based on evidence and experience. Using the response components identified in the CPIP, with a focus on those requiring F/P/T public health leadership and consultation, this section provides details on national-level activities planned or already underway that will assist and expedite complementary planning in each federal government department, province and territory.



6.1 Surveillance

The purpose of surveillance and risk assessment activities is to provide decision makers with the timely epidemiological and risk information they need to inform action. Similar to national influenza surveillance (FluWatch), COVID-19 surveillance is a pan-Canadian initiative that integrates numerous data streams including existing surveillance systems with novel, non-traditional data sources.

Current Status/Focus

Currently, the following data sources are facilitating monitoring across the spectrum of disease (i.e., from mild cases in the community based on sentinel surveillance to severe illness based on hospitalization data).

- Case-level data reported by PTs: Revised national dataset including more information on cases, risk factor data, improved occupational data, and the addition of race/ethnicity data is a key priority.
- Aggregate laboratory result data: Provincial public health laboratories and PHAC's National Microbiology Lab report numbers of people tested for SARS-CoV-2.
- Syndromic surveillance data: Canadian residents with influenza-like illness and individuals reporting influenza-like illness to participating sentinel practitioners participating in PHAC's FluWatch.
- Apps: User data from Canada COVID-19 and other symptom tracking applications.
- Mobility data: Partnership with BlueDot Inc., and other sources that may become available, to monitor indicators of population movement as a proxy measure for compliance with PHM, and the levels of inter-P/T movement.
- Special survey: Impact of COVID-19 on specific populations (e.g., health care worker).
- Sentinel Surveillance Networks:
 - Hospital networks - Several hospital-based data streams measure the impact of COVID-19 in Canadian hospitals and collect detailed case information on most severe cases.
 - Canadian Pediatric Surveillance Program - occurrence of Multi Inflammatory System in Children (MIS-C).
 - Community-based systems/ networks - Assess the level of transmission in the community and the epidemiologic characteristics of outpatient cases.
- Publicly available data: supplementary data source to add situational awareness on COVID-19 transmission in jurisdictions.

Preparations/Forward Planning

Preparations are underway to improve the quality, completeness and timeliness of surveillance data in advance of a potential fall resurgence. This includes F/P/T/Indigenous support of First Nations/Inuit/Métis-led data management. In general, the multiple data streams are being configured in order to pick up signals and changes in epidemiology. These preparations and ongoing activities based on the anticipated short, mid or long-term timeframe are identified below.

Short term:

- Work with Surveillance Expert Working Group (SEWG) on the operationalization of a new national dataset.
- Work with the PHAC Health Portfolio Operations Centre (HPOC) to ensure seamless reporting and mapping to existing data.

- Updating/developing data dictionary, case report form, metadata guide (i.e., description of data collection processes in each jurisdiction), and surveillance guidance.
- Implementation of updated database infrastructure.
- Work through the Canadian Public Health Laboratory Network (CPHLN) to determine what demographic data on COVID-19 tests would be available at the national level and to improve laboratory surveillance data stream.
- Continue the work with P/T representatives to increase standardization of outbreak reporting (including establishment of a weekly outbreak dataset) via the Canadian National Public Health Intelligence system.

Medium to Long term:

- Consideration of new cloud-based database for use in HPOC and to support multiple data streams.

Planning Variables or Signals

It is possible that a new syndrome or rare event would require the development of a new, or adjustments to, the surveillance strategy as has occurred for Multisystem Inflammatory Syndrome in Children (MIS-C).

New settings or populations affected by outbreaks could emerge in outbreak surveillance (or via outbreak intelligence gathering) which could precipitate new data needs, additional surveillance activities or new variables to be collected to inform actions. For example, outbreaks among temporary foreign workers have highlighted the need to be prepared to rapidly implement specific surveillance and coordination mechanisms, as well as drawn attention to how social determinants of health (e.g., crowded housing, precarious work, access to medical services) can impact transmission and control of COVID-19.

6.2 Laboratory Response Activities

Laboratory-based surveillance is an integral part of monitoring respiratory virus activity. Because there are numerous respiratory viruses circulating at one time especially during the fall and winter seasons, laboratory testing using validated tests is critical for diagnosing COVID-19. Since the start of the COVID-19 outbreak, Canada's National Microbiology Laboratory (NML) has been providing leadership in regard to testing for COVID-19 and surge capacity for provincial and territorial public health laboratories. The NML has also contributed to domestic and international efforts to better understand COVID-19 virus characteristics that can inform the development of medical countermeasures.

Current Status/Focus

Canada's public health laboratories response activities are currently focused on the following:

- optimizing molecular testing to reduce reagent consumption by exploring the reduction in PCR target genes, pooling of samples, evaluating the optimal types of samples, swabs and transport media, through the Canadian Public Health Laboratory Network (CPHLN);
- working to evaluate serological testing kits as well as developing in-house contingency serological tools such as ELISA, neutralization assays and point of care tests (serological work is in support of the broader Canadian Immunology Task Force);

- supporting work being done by the Canadian COVID Genomics Network (CanCOGeN) to sequence 150,000 genomes;
- working closely with northern, remote and Indigenous communities to enable those communities to have greater access to laboratory diagnostic tools (e.g., diagnostic platforms, reagents, training, supply chain management, and augmentation of Transport of Dangerous Goods (TDG) sample shipping requirements) to meet pandemic challenges in those and all Canadian communities; and
- undertaking (through the NML) animal research that will aid in understanding pathogen characteristics.

Preparations/Forward Planning

The NML together with the CPHLN undertaking the following activities in order to prepare for a potential fall resurgence based on the reasonable worst case scenario but also as part of the laboratory preparedness long-term vision.

Short term:

- Optimizing molecular testing to be able to distinguish COVID from non-COVID respiratory infections during the coming flu season
- Continuing strong communication among Canada's public health partners through CPHLN to ensure aligned and appropriate laboratory response strategies

Mid term:

- Optimizing serological testing to be able to determine whether individuals have been previously infected, especially for healthcare and other service providers such as police, fire, long-term care facilities, etc.
- Streamlining molecular and serological testing, including stewardship of reagents so they are conserved as testing demands increase
- Developing, validating, and enabling greater access to faster diagnostic tools such as Point of Care tests (prioritizing northern, remote, isolated and Indigenous communities)
- Working with manufacturers to enhance the sourcing of critical laboratory supplies that meet appropriate standards
- Working with P/Ts and other stakeholders to inform the use of testing in specialized settings (such as borders)

Planning Variables or Signals

Although the percentage of positivity has been diminishing recently, a change in the inflection of that curve (i.e., switch to increasing trend) is an immediate signal that a second wave has been triggered and therefore may affect timelines, strategy or prioritization of these activities.

6.3 Public Health Measures

PHM are the activities implemented by public health authorities to support individuals and communities to prevent, delay or mitigate infectious disease transmission. These include measures focused on individuals (i.e., personal practices, case and contact tracing, self-monitoring, isolation and quarantine) to protect themselves and others, and community measures such as public education campaigns and general recommendations for non-pharmaceutical interventions (e.g., hand hygiene, physical distancing

and use of non-medical masks) to protect groups and the community at large. The community-based measures should be informed by a risk assessment tailored to each setting. Some measures are referred to as “restrictive” if they include limiting the movement, activities, or access to resources/facilities/institutions, at the community as opposed to individual level (e.g., school closure, cancellation of mass gatherings, access to workplaces, businesses or event venues). Many of these measures have important consequences beyond the context of COVID-19 management which require careful consideration and prioritization in relation to other determinants of health, such as childhood development.

Since the start of the COVID-19 outbreak the F/P/T public health response has involved working closely with multilateral partners, other government departments, First Nations, Inuit and Métis stakeholders to develop, update and disseminate appropriate public health guidance for a range of target audiences on how to detect, report, prevent and manage COVID-19 infection. One example of this is the formation of the Public Health Working Group on Remote, Isolated and Northern Indigenous Communities that is working to adapt public health measures guidance to the unique needs, context and considerations of these communities in the response.

Current Status/Focus

Current FPT PHM include:

- Focusing on isolating all cases, and tracing and quarantine of all contacts in a timely manner;
- Monitoring the evolving domestic and international situation, updating advice and adjusting PHM accordingly (e.g., advice on non-medical mask use);
- Phased lifting of restrictive PHM by PTs while monitoring for signals of concern (e.g., increases in unlinked cases) and protecting high-risk populations;
- Promoting risk based approaches to using PHM based on the setting and consideration of the broad impacts of PHM on health and wellbeing;
- Supporting workplaces/businesses by working with the Canadian Centre for Occupational Health and Safety, to provide guidance for safe and healthy workplaces; and
- Developing and updating national guidance as information becomes available.

Preparations/Forward Planning

In terms of F/P/T preparations, the focus is on building, adjusting and updating existing PHM guidance and resource products as needed, based on new knowledge, experience and contingencies (including planning for the reasonable worst case scenario).

It is important that these ongoing activities continue to be as timely and responsive as possible and take into consideration the specific needs of high-risk populations by social, economic and demographic factors. Community-based PHM are most effective when implemented as early as possible in response to epidemiological triggers of concern. Therefore, preparations include being ready to re-implement restrictive community PHM if required, while modifying them if possible to avoid negative impacts on health, wellbeing and society. Communication activities that continue to build public trust and confidence will be critical to facilitating public understanding and cooperation with respect to recommended PHM.

These preparations and ongoing activities based on the anticipated short, mid or long-term timeframe are identified below.

Short term:

- Ongoing updates to existing national guidance as evidence evolves;
- Completing new guidance (e.g., post secondary guidance);
- Updating public and health professional communication and education products;
- Developing sufficient P/T public health capacity to isolate cases, trace and quarantine contacts in place, including through the use of digital tools;
- Establishing a process for providing comprehensive advice to workplaces/businesses.

Mid term:

- Ongoing situational monitoring of COVID-19 and broader impacts of PHM and recommendations, updating advice and adjusting PHM accordingly;
- Ongoing guidance updates;
- Monitoring public compliance with PHM; adjusting messaging and enforcement as required;
- Re-instituting PHM in jurisdictions, if resurgence occurs;
- Providing considerations for PHM into plans for vaccination clinics (influenza and COVID-19); and
- Re-evaluating F/P/T plans for stockpiling supplies (e.g., hand sanitizer, gloves, masks, disinfectant supplies) in consideration of PHM

Long term:

- Evaluating the long-term strategy for PHM and developing/updating F/P/T plans;
- Providing public education to entrench PHMs as a core practices that will become the new baseline practices based on effectiveness of measures (evidence reviews); and
- Work with other sectors to strengthen the social services to protect health and mitigate risk.

Planning Variables or Signals

Preparations and forward planning will consider adaptations to current activities, recommendations and guidance, e.g., if there are significant changes in diseases activity, high risk groups or public adherence to recommended PHM, and the impact these may have in various population groups.

6.4 Infection Prevention and Control and Clinical Care Guidance

While impacting the F/P/T public health response, the provision of infection prevention and control (IPC) and clinical care guidance and expert advice has predominantly been aimed at informing practising health care professionals. Therefore engagement with stakeholders outside of the public health sector, in particular front line health care workers, is a key part of supporting preparedness.

Current Status/Focus

The current focus of response activities pertaining to IPC and Clinical Care include:

- Ensuring that previously published COVID-19 Infection Prevention and Control documents continue to provide relevant and evidence-informed guidance;
- Updating (based on new information) the interim guidance for the clinical management of patients with moderate to severe COVID-19;
- Providing clinical guidance on the changing presentation, complications, risk factors and outcomes of COVID-19;
- Completing any outstanding guidance products;

- Planning for joint PHAC/Association of Medical Microbiology and Infectious Disease Canada (AMMI) webinars addressing ongoing key clinical issues that will occur once a month starting July 2020, potentially through to March, 2021; and
- Providing key clinical journal articles review and summation to F/P/T public health tables.

Preparations/Forward Planning

All Clinical Care Guidance and Infection Prevention and Control documents are being reviewed on an ongoing basis to ensure they reflect the most up to date information on clinical care and IPC. This includes key clinical findings in the literature, responding to new and/or changing science.

Planning Variables or Signals

If additional clinical or infection prevention and control information emerges, (e.g., a change in mode of transmission or additional or unknown risk groups), there may be a need to revise or develop additional IPC or Clinical care guidance documents. Similarly, the identification and availability of an effective treatment will require updating of Clinical care guidance.

6.5 Vaccination

The World Health Organization (WHO) is providing information on the progress of over 150 COVID-19 vaccine candidates⁹. At this time 21 candidate vaccines are in clinical evaluation and 139 candidate vaccines are in preclinical evaluation. It is necessary to start planning for implementation of a COVID-19 vaccine strategy for Canada now, however, for planning purposes it is assumed that an efficacious vaccine will not be available until 2021 at the earliest.

Reducing hospitalizations due to seasonal influenza and invasive pneumococcal disease through increased vaccine coverage can preserve both public health (e.g., diagnostic/testing, outbreak response) resources and health care (i.e., outpatient visits and inpatient stays) capacity¹⁰. For these reasons it has been identified as a forward planning element.

Current Status/Focus

PHAC is involved in COVID-19 vaccine planning through strategic discussions with the regulator and potential manufacturers. PHAC has also engaged the National Advisory Committee on Immunization (NACI) to develop an equitable, ethical, feasible and accessible framework outlining prioritization principles that will optimize public health benefits from vaccination against COVID-19 during the pandemic. NACI has also published guidance on COVID-19 vaccine research priorities.

Preparations/Forward Planning

Anticipating that it will take time to manufacture a sufficient supply of a new COVID-19 vaccine, and shipments may be staggered, Canadians need to be aware that the vaccine will not be offered to all Canadians at the same time. Furthermore, the traditional influenza pandemic vaccine approach (i.e. to vaccinate everyone immediately) may not be advisable or appropriate for a novel coronavirus vaccine developed where there is limited experience of its safety and effectiveness.

It is expected that PHAC will have an interim framework informed by NACI at the end of summer 2020, following extensive evidence reviews and F/P/T engagement to identify target groups for the first available doses of COVID-19 vaccine and vaccine program strategies. In the absence of a COVID-19

vaccine, general planning (as outlined in the Vaccine Annex of the CPIP) is proceeding, for example, enhanced tracking systems for adverse events following immunization (AEFI), vaccine effectiveness (VE) assessment and uptake; allocation, storage and handling; vaccine delivery strategies, are all being addressed as part of the vaccine strategy for COVID-19 vaccination in Canada. In the event vaccine is sourced from manufacturers that do not have an existing Canadian presence, PHAC may also be involved in contracting for vaccine storage and distribution centres. In addition, the Government of Canada is proactively procuring essential supplies (e.g., needles, syringes, epinephrine, etc.) on behalf of the PTs via the National Emergency Strategic Stockpile to mitigate against potential supply shortages when a COVID vaccine becomes available for use in Canada.

A newly formed Government of Canada COVID-19 Vaccine Task Force will focus on strategic investments in vaccine research, development, and domestic bio-manufacturing to facilitate domestic vaccine supply. In addition, a COVID-19 Vaccine Clinical Trial Discussion Forum is convening academic, government, and industry partners to discuss vaccine clinical trial challenges and optimal designs.

While a COVID-19 vaccine is not anticipated in time to respond to any fall resurgence of COVID-19, the timelines for guidance products is as follows:

Short term:

- Interim NACI guidance (this fall) on COVID-19 vaccine strategies and target groups for early vaccines.

Mid term:

- Adaption of the contents of the CPIP Vaccine Annex for the COVID-19 context.

Longer term:

- Enhancements/preparations for AEFI tracking and analysis;
- NACI final programmatic guidance on the use of authorised COVID-19 vaccine(s); and
- Logistical planning for supply chain, including for transport /storage /use of vaccines in northern, remote, isolated settings and Indigenous communities.

Influenza vaccines and routine programs

F/P/T public health responders are concerned about interruptions to routine immunization programs due to COVID-19 PHM and physical distancing, and are monitoring trends. To this end, PHAC has issued guidance on the importance of immunization program continuity in particular to mitigate the risk of measles and other vaccine-preventable disease outbreaks once international travel resumes.

Also of concern is the potential convergence of COVID-19 and influenza in fall 2020, which could exacerbate pressures to the health system. In response, PHAC is taking action to order a specialty influenza vaccine (Fluzone High Dose) on behalf of the P/Ts for the 2020 influenza season to support the prevention of influenza transmission and outbreaks in long term care (LTC) homes. PHAC has ordered enough vaccine for all adults over 65 years in LTC. The intent is to reduce the burden of influenza on the healthcare system and LTC homes/facilities that will potentially be dealing with concurrent COVID-19 outbreaks.

In anticipation of increased or sustained COVID-19 transmission during the roll-out of influenza vaccination programs (fall, 2020), PHAC is also preparing guidance on the delivery of influenza vaccine in the presence of COVID-19. The guidance will focus on alternative delivery models, clinic set up, changes

to immunization practices and processes, infection prevention and control, and personal protective equipment at influenza vaccine clinics.

Planning Variables or Signals

It is important for planning purposes to recognize that the final vaccine strategy in Canada cannot be designed until more is known about the new COVID-19 vaccine's characteristics (e.g., efficacy, safety, dosing schedule), how well the candidate vaccines work in different populations (e.g., elderly), and the supply situation. Forward planning should include consideration of variations in vaccine acceptability and response to AEFI reports or signals. This will require AEFI surveillance, health promotion and education and risk communication expertise.

6.6 International Border and Travel Health Measures

Since the onset of the pandemic, the Public Health Agency of Canada (PHAC) has significantly shifted its border and travel health programs to focus primarily on mitigating the risk of COVID-19 importation and together with other response measures, protecting the capacity of provinces and territories to offer health services to Canadians. Prior to this pandemic, it was not envisioned that extensive international border closures would be implemented as a pandemic response measure.

Current Status/Focus

Several new and enhanced border and travel health measures critical to the COVID-19 response have been developed and implemented including:

- an increased capacity for PHAC to undertake health-related risk assessments and provide travel advice and other measures to minimize the risk of Canadians' exposure to the disease, including on conveyances (air, marine, land);
- leveraging the provisions of the *Quarantine Act*, together with the creation of a new compliance and enforcement regime, to limit entry of foreign nationals and impose new quarantine and isolation requirements for incoming travellers to Canada;
- the establishment of a stronger public health presence at the border (i.e., public health officers being assigned to 36 high volume points of entry) as well as enhanced PHAC capacity to conduct virtual health assessments for COVID-19 via access to a 24/7 Central Notification System;
- the establishment of temporary federal quarantine facilities across the country and their continued management to support enforcement of public health Orders;
- enhanced partnerships with provincial and territorial health authorities and other key players to support data-sharing, compliance, enforcement of quarantine and awareness on COVID-19 (e.g., through the ArriveCan app); and
- messaging and communication tools for the travelling public.

Preparations/Forward Planning

Moving forward as part of planning for a potential resurgence of the disease, PHAC will continue to maintain a high level of readiness to respond to COVID-19 through a combination of border and travel measures that are calibrated to:

- Evolution of the domestic COVID-19 situation and provincial and territorial considerations;
- Updated modelling and risk analysis of other countries and international experiences to ensure lessons learnt;

- Operational capacity pre-, at- and post-border to handle anticipated increased incoming and outbound travel volumes;
- Consideration of public health/health system capacity to manage potential increase in imported cases (testing, contact tracing and reporting, provincial and territorial health care capacities); and
- Volumes that different classes/sectors or arrival modes bring to Canada.

Planning Variables or Signals

Should the international and/or domestic context shift, signalling a need for Canada to consider border and travel measures anew, there are a variety of possible approaches that could be explored:

- **Global restrictions:** Increase/impose global restrictions for all destinations, control through health-related measures. Possible exclusion of high-risk countries based on country risk assessments.
- **Country-specific restrictions:** Remove global advisory/prohibition of entry, but maintain/impose restrictions for individual destinations by exception, based on risk of importation
- **Sectoral/class restrictions:** Decrease exemptions to travel measures based on a sectoral analysis
- **Reciprocal:** Leave global advisory/prohibition of entry, remove or ease restrictions based on reciprocal arrangements with individual states (or regions e.g., Caribbean) and assessment of respective COVID situations
- **Modal:** Ease measures first for entry by air/sea and later for entry by land

6.7 Health Care System Infrastructure

A peak in pandemic activity greater than the first COVID-19 wave in any jurisdiction can have a substantial impact on health care service capacity and the ability of health care organizations to keep those providing or receiving health care services safe.

Current Status/Focus

The F/P/T public health response in terms of health care system infrastructure has involved linking with those partners responsible for monitoring, anticipating and planning for surges in health care system capacity in order to increase mutual knowledge and situational awareness, and support response activities regarding the delivery of health care to COVID-19 cases in Canada. To support this work:

- the Government of Canada together with the PTs have taken steps to support hospital surge capacity and ensure timely access to critical equipment and supplies;
- funding has been provided for the development, expansion and launch of virtual care and mental health tools to support P/T services;
- modelling has been used to project anticipated demands;
- sharing of hospital-based data (on rates of admission, current capacity and equipment/supplies/resources usage) has been included in surveillance products; and
- the Logistics Advisory Committee (LAC) has been convened to facilitate resource procurement.

Preparations/Forward Planning

In terms of forward planning, the Government of Canada will continue to:

- consult with PTs and use modelling to assess need for additional procurement of personal protective equipment (PPE), essential supplies, and life-saving medical equipment to support P/T health care systems and increase National Emergency Strategic Stockpile (NESS) capacity

- explore opportunities to build domestic production capacity for critical PPE and other essential supplies
- monitor for potential COVID-related drug shortages and work with P/Ts and stakeholders to proactively develop and implement strategies to manage these risks
- provide PPE to First Nations, Inuit and Métis communities to ensure the safety of healthcare workers and others supporting the delivery of health services through the Indigenous Services Canada (ISC) PPE Stockpile and PHAC's National Emergency Strategic Stockpile (NESS)
- facilitate sharing of best practices on alternate care facilities, triage and management of delivery of non-COVID-19 health care services review the latest available scientific evidence to inform guidance for health settings and develop tailored approaches for communities with specific health care needs, such as remote, northern and isolated communities as well as Indigenous peoples in urban settings.

Health care institutions, many of which are already working close to full capacity, need to plan for how they will accommodate potentially large influxes of patients, including establishing ethical frameworks for the allocation of scarce resources such as ICU beds and ventilators. In remote, northern and isolated communities it is also critical to plan for potential supply-chain and medical evacuation interruptions due to weather.

Forward planning must consider the broad health care system impacts and changes that occurred during the initial wave of COVID-19 in Canada. Specifically, the unanticipated reduction in emergency room visits for serious conditions, the shift of primary care to virtual care, and the backlog of surgery, need to be addressed both in terms of the implications for “catchup” and the need to plan for future waves in a way that doesn't shut down the health care system more than is necessary.

Planning Variables or Signals

In the event health care institutions start to see an increase in the number or change in the characteristics (e.g., demographics, underlying medical conditions) of patients being treated for COVID-19, the Government of Canada will work with PTs to monitor capacity and use of PPE, ventilators, intensive care unit (ICU) beds, and other critical supplies, to enable collaborative and effective management of outbreaks. Surge capacity in terms of health care workers and other human resources is also being examined.

6.8 Risk Communications and Outreach

Communication of information and advice in a public health emergency is a critical public health intervention that helps to protect public health, save lives, and minimize the overall social and economic impacts. Using a risk communications approach, the Public Health Agency of Canada, together with other government departments and P/Ts counterparts, have worked hard to provide health care providers, Canadians and key stakeholders with the timely, trusted, accessible, evidence-informed and complete information they require to protect themselves, their families, their communities and businesses.

Current Status/Focus

The current focus is on communicating clear, concise and concrete messages that will cut through the current fatigue, confusion and fragile compliance, in order to: ensure Canadians have the information they need to protect themselves and others from the virus and to reduce its impacts on personal health,

the healthcare system, social life and the economy as Canadians' transition into the new reality of 'Living with COVID-19'; and to help Canadians make a conscious and informed decision about the activities that they will participate in outside the home and how they can participate in a way that protects them, their families and communities.

Key activities to date include:

- engagement of F/P/T and Indigenous networks to ensure consistency of messaging and to share best practices (and lessons learned) across jurisdictions;
- briefings by Chief Medical Officers of Health and local Medical Officers of Health in the PTs and nationally by the Chief Public Health Officer and Deputy Chief Public Health Officer –including modelling and epi updates;
- targeted communications on enhanced border measures;
- use of all communications levers (advertising, web, social media, regular briefings, national mail outs, partnerships, P/T collaboration, community outreach, etc.) to reach stakeholders (including the Canadian public);
- The implementation of a four-phased COVID-19 Risk Communications Strategy with different foci (e.g., containment and delay, tools and empowerment, mitigation and working together to 'flatten the curve', perseverance and ongoing vigilance in context of disease reduction and re-opening of society); and
- F/P/T and Indigenous community collaboration to share best practices and lessons learned and to ensure future messaging is aligned and consistent (via Public Health Network Communications Network and the Special Advisory Committee).

Challenges and Considerations:

Messages in the earliest phase of the pandemic were clear – stay home; wash your hands – now the environment is much more complex:

- There are different epidemics across the country so different public health measures are in place across jurisdictions. Messages and their delivery must be clear and firm to combat any confusion.
- There is still much uncertainty that impacts how precise and definitive we can be in our messaging. As science evolves and we learn more, advice to Canadians may change, adding to confusion and accusations of flip-flopping from earlier messages.

Communicating is becoming more complex as the economy reopens and Canadians engage in social and economic activities following a prolonged period of disruption to their lives:

- Canadians are being encouraged to participate in the economy as it re-opens in this period of recovery. We need to help people make an informed and conscious decision each time they leave their home to help them protect themselves and others.
- Canadians need to assess their activity, their risk tolerance, their risk to others and the importance of their own behaviour in reducing risk. Our communications efforts must arm them with the information to do so easily and accurately.

The risk perception (and compliance) of Canadians will vary based on their individual experiences and their unique reality.

- We need to maintain the current level of compliance and find ways to continue to encourage and provide positive reinforcement to those who are following public health guidance while tackling low risk perception and compliance among specific groups.

Preparations/Forward Planning

It is now important to shift messaging as we transition Canadians into the reality of 'Living with COVID' and transition nationally from an acute response to the loosening of public measures to varying degrees across the country. The lifting and loosening of PHM needs to be balanced with the message that certain measures must remain in place in order to keep the level of transmission at a locally manageable rate. All levels of government need to communicate that Canadians should be prepared for a walk back or tightening of PHM if necessary.

The forward planning communications approach includes:

Provide clear, consistent, concise and concrete messages and advice with relatable examples and tools for Canadians:

- Apply behavioural science to test a variety of public health messages and tools.
- Guidance to help the public minimize risk while venturing out into public spaces.
 - Checklists for when you leave the house
 - Decision making tools

Stop telling and start showing:

- The best way to reinforce the behavior we want from Canadians is to demonstrate it.
- Showcase community members/organizations/spokespersons who are "doing it right."
- Leverage more storytelling to motivate behavior (youth testimonials, etc.).
- Recognition and celebration of those who have made a difference.

Communicate with empathy and honesty

- The efforts of Canadians through the first phase have very likely saved thousands of lives. Need to acknowledge that and encourage everyone to keep doing that.

This approach will be supported by F/P/T strategies, content and implementation plans that include:

- Sufficient public opinion research (POR) and behavioural insights (re. behaviours, vaccine, public health measures, back to school) to identify all Canadians' priorities, values and concerns, and capture regional variations;
- Public Education Campaigns
- Vaccine readiness campaigns (seasonal flu and COVID-19);
- Travel readiness campaigns;
- Contact tracing related communication activities;
- F/P/T collaboration to share best practices and lessons learned and to ensure future messaging is aligned and consistent (via PHN Communications Network and SAC).

This will predominantly be achieved through strategic outreach and engagement by the Chief Public Health Officer (CPHO), Deputy Chief Public Health Officer (DCPHO) and P/T spokespersons, public education campaigns, media relations and issues management, social media, and website updates. Significant outreach and engagement with a range of health and non-health stakeholders has been an essential part of the national response to COVID-19. This outreach and engagement has evolved throughout the pandemic from a focus on proactively sharing the latest public health developments and resources to identifying stakeholder information needs and perspectives, to collaborating on guidance development and joint communication messages. A range of stakeholders have been engaged through

regular COVID-19 briefings, teleconferences and webinars including the following: CPHO Health Professionals Forum (national health professional organizations), national allied health organizations, local public health medical officers of health, critical infrastructure stakeholders, agriculture and agri-food stakeholders, business groups, and childcare and education stakeholders.

It has been and continues to be especially important to engage community leaders from Indigenous communities, racialized communities/communities of color, and faith-based organizations to help deliver critical information¹¹.

Planning Variables or Signals

Surges in cases requiring change in or implementation of restrictive community PHM along with any changes in science (e.g., new information about COVID-19 that requires a shift in Canada's public health response or guidance to specific populations), changes to border measures, indicators of vaccine hesitancy and vaccine availability, will all necessitate updating of the current F/P/T communication strategy and products.

6.9 Research

The Government of Canada has mobilized Canada's research and scientific communities in response to the spread of the novel coronavirus (COVID-19). Priority research areas include medical countermeasures (vaccines, therapeutics, and diagnostics), clinical management research, as well as social and policy research.

Current Status/Focus

Currently:

- the Government of Canada has established mechanisms for mobilizing rapid research responses for this type of emergency, which have been activated to accelerate development of medical countermeasures, to support priority research on the transmission and severity of COVID-19, and to understand the potential benefits and potential limitations of medical, social and policy countermeasures;
- Health Canada has established a number of temporary innovative and flexible measures to help prioritize and expedite the regulatory review of COVID-19 health products without compromising Canada's high standards for safety, efficacy and quality (these measures have been put in place to facilitate safe and timely access to products Canadians and health care workers need);
- there are several federal programs available aimed at mobilizing industry, innovation and research to respond to COVID-19;
- capacity at federal research facilities is being leveraged, and federal granting agencies are strategically aligned to support Canadian research capacity;
- the Canadian private sector (R&D, manufacturing) is being engaged to contribute research and development solutions; and
- the Government of Canada is also supporting various strategies to bring significant findings arising from these research efforts to decision-makers in a useful and timely way.

Preparations/Forward Planning

In order to prepare for a fall resurgence based on the reasonable worst case scenario, the following needs have been identified:

- Need to prioritize and pursue a wide array of **Clinical Trials activities** for therapeutics and vaccines.
- Need to strengthen our capacity to deliver on **relevant COVID-19 modelling work**: The COVID-19 epidemic has demonstrated the important role and need for greater and ongoing capacity to implement the full range of modelling tools required to support decision-making during a complex public health crisis. Models help to predict where and when COVID-19 infections may emerge or re-emerge, and they can be used to explore the best combinations of approaches to control disease progression and protect the health of Canadians.
- Need to **pursue research and surveillance studies** aiming at better understanding mechanisms of infections and immunity against the COVID-19 virus. Investigating and tracking the genetic diversity of SARS-CoV-2, the virus that causes COVID-19, across Canada to better respond to its spread; evaluating and establishing blood test (serologic) methods to determine the immune status of Canadian populations; and research and research coordination with partners to develop COVID-19 animal models and medical countermeasures.
- There is a need to invest in and mobilize knowledge relating to social sciences such as sociology, anthropology and psychology. Specifically **behavioural science and ethnic research** can guide future policy and regulatory actions.
- Need to strengthen our capacity to perform **rigorous and rapid evidence review** to generate evidence reviews and answer specific questions to provide the most up-to-date science evidence for optimal decision-making.
- Need to explore the epidemiological value of new, innovative methods to track community spread, such as **testing SARS-CoV-2 from sewage water** to provide early warning ability at the community level (municipality, special settings such as Long-Term Care Facilities, prisons, hospitals and remote communities).

Short to Mid term:

In the short to mid term, the approach to these preparations is to:

- Work collaboratively with National partners, FPT, stakeholders groups (including National Indigenous Organizations; Indigenous researchers and scholars; National Collaborating Centre for Indigenous Health), and the Federal Science Community to support the work of key task groups mandated to support Canada's COVID-19 response (Immunity Task Group, the Vaccine Task Force, the Therapeutic task Group) and Indigenous-led culturally grounded research;
- Work collaboratively with Federal Science Based departments with specific targeted engagement with the CIHR and the Chief Science Advisor of Canada; and
- Continue engagement with the pan-Canadian Public Health Network (via the Technical Advisory Committee and Special Advisory Committee). Activities include sharing research, data and local experience that will inform further planning in alignment with our stated public health pandemic goal and objectives (e.g., quantifying the negative and positive consequences of the PHM that were used in the initial response to be better able to address the inequities that have arisen).

Long term:

In the longer-term, efforts will include seeking investment to strengthening laboratory capacity in the area of genomic innovation and bio-informatics.

Planning Variables or Signals

As with other response component several factors including: evidence of significant increased in the mortality ratio, data from vaccine and therapeutic clinical trials, data on immunological protection of Canadians, new / rigorous knowledge on the impact of COVID-19 specific high-risk groups, a significant shift in genomic pattern of SARS-CoV2 (leading to examine possible shift in virulence or infectivity) and new / rigorous knowledge of the importance of a non-respiratory mode of transmission, would potentially impact preparations for the ongoing COVID-19 response.

7. Planning with Indigenous Communities

Indigenous communities have been supported as they worked to update and activate their community pandemic plans. Over 30 Indigenous organizations have been engaged and collaborating together to support public health response through the Public Health Working Group on Remote, Isolated and Indigenous Communities as part of the SAC structure. Indigenous Services Canada (ISC) together with National Indigenous Organizations (NIOs), have been leading work with PHAC, Statistics Canada and the First Nations Information Governance Centre to address data gaps regarding the impacts of COVID-19 on Indigenous Peoples.

As a result of community supported response efforts, infection rates on-reserve and in the North have remained lower than the rate in the overall Canadian population. However, it is important to note that gaps for urban, Métis, Inuit and off reserve First Nations populations persist and increased linkages are required to support these populations. A summary of the response activities that have been supported to date in addition to the strategy/approach, actions and deliverables for these preparations for the short, mid and long term (i.e., being before September, September to December, and 2021 and beyond, respectively) are included in *Appendix 3: COVID-19 Response Planning with Indigenous Communities*.

8. Planning for High-risk settings and populations

A specific setting may be considered as “high-risk” due to:

- the potential for higher rates of severe disease or death amongst those in the setting compared to that of the general population (because of clustering of people with underlying medical conditions, clustering of those in high-risk age group or both); and/or
- potential for high rates of transmission (because of unavoidable crowding indoors with limited ability to use or inconsistent use of protective measures).

Epidemiologic investigations of outbreaks in these settings are key to improving our understanding of transmission dynamics and setting-specific risks. It can be challenging to significantly mitigate these risks; therefore planning activities need to look at the specific circumstances of each setting and what enhanced measures can be put in place to prevent and manage COVID-19 outbreaks in these highly variable contexts. This should include measures to prevent introduction of the virus into these settings, (e.g., through screening of employees and visitors, restriction of visitation, efforts to prevent work at more than one high-risk location, implementation of a quarantine period for people entering the setting).

As has been observed during the first wave of COVID-19, high-risk settings that would benefit from special planning considerations have included:

- Long-Term Care facilities.
- Worksites necessitating close proximity to others (e.g., meat processing) or with communal housing (e.g., temporary foreign workers living on work farms, remote/fly-in work camps like northern mines).
- Remote populations without ready access to advanced health services (e.g., fly-in only access communities), and with potentially elevated rates of underlying medical conditions or other pre-existing disparities.
- Homeless shelters.
- Prisons.

While guidance has been developed and measures have been put in place aimed at preventing further outbreaks in these settings, planning for the reasonable worst case scenario necessitates that we undertake activities in the short term to shore up capacity to undertake prevention and outbreak response measures, as well as, continuously monitoring these measures and adjusting as necessary. For example:

- If there were to be a high level of pandemic activity in the surrounding geographic areas would the response plans for these settings be applicable and sufficient?
- What are the existing gaps in guidance, measures or resources, and how can these be addressed prior to a potential fall resurgence?
- Are prevention measures that were implemented during the first wave of COVID-19 sustainable and realistic for a fall resurgence and/or the reasonable worst case scenario?
- What impact could these measures have on high-risk populations?

This collaborative work to plan and support high risk settings and populations will continue at all levels of government and across multiple sectors and stakeholders from public health, health care, education, agriculture/agri-food, immigration, economic development, corrections, social services/housing, science/research and labour.

As work continues, it is important to take into consideration the impact that these measures may have on the various sociodemographic groups most likely to be affected. Considerations for low-income workers, seniors, migrant workers, persons living in overcrowded housing, persons experiencing homelessness, and prisoners, among others, will need to remain a cornerstone of all response plans.

9. Assessment and Evaluation

Assessing and evaluating pandemic response efforts during periods of relatively lower response tempo will help identify areas of improvement and prioritize future planning efforts. It is also vital, on an ongoing basis, to determine whether response activities have been effective and implemented efficiently so as to achieve the intended results and whether areas of uncertainty (see Section 4) can or have been addressed. The F/P/T COVID-19 response governance structure (see Appendix 1), which includes the Special Advisory Committee (SAC), Technical Advisory Committee (TAC) and Logistics Advisory Committee (LAC), provides multiple forums for these discussions and opportunities for sharing of experience, lessons learned and identified best practices. More structured processes for assessment

and evaluation, including in-action and after-action reviews should be considered at all levels of government to inform forward planning and future pandemic preparations.

Now that the initial wave of COVID-19 is subsiding and our collective knowledge about this disease and its impact has increased, the broader direct and indirect consequences of the COVID-19 response in terms of other physical and mental health outcomes as well as societal and economic impacts must be acknowledged and assessed so that reduction of negative impacts can be accounted for in comprehensive forward planning efforts.

This should involve consideration of the impact response measures may have on individuals' physical, social, mental and emotional health and wellbeing, including how this may affect the adoption of control measures. The broader impact of restrictive community PHM in terms of health, wellbeing, child development and welfare needs to be assessed and plans implemented to prevent other immediate health harms and to prevent increasing health inequities for higher risk populations. These could be in the area of other direct impacts to health including; risks of delaying health procedures, domestic violence, child welfare/neglect, reducing access to harm reduction services or safe drug supply and mental health services. It could also involve addressing indirect COVID-19 associated health and wellbeing risks such as congregate housing, low employment standards, lack of access to educational supports for high need students, and risk of visitor restriction policies (e.g., family caregivers in long-term care homes).

Resources and guidance to support mental health is in development, however the need for other resources needs to be considered. Furthermore, improving the conditions (such as housing and employment conditions) that increase the risks associated with COVID-19, could also help reduce the health and societal impacts of future pandemics.

Appendix 1: Canada's Public Health Emergency Response System and Inventory of Resources, Guidelines and Agreements to inform COVID-19 Preparedness and Response

Canada's public health emergency response "system" comprises a series of complementary, mutually reinforcing plans, arrangements, protocols and networks that incorporate lessons-learned from previous outbreaks like SARS, 2009 H1N1 pandemic and Ebola which are regularly updated to reflect the latest evidence and scientific advance. Taken together, they span the local, provincial, territorial, pan-Canadian, North American and international levels and provide a strong and proven framework for Canada's response to COVID-19.

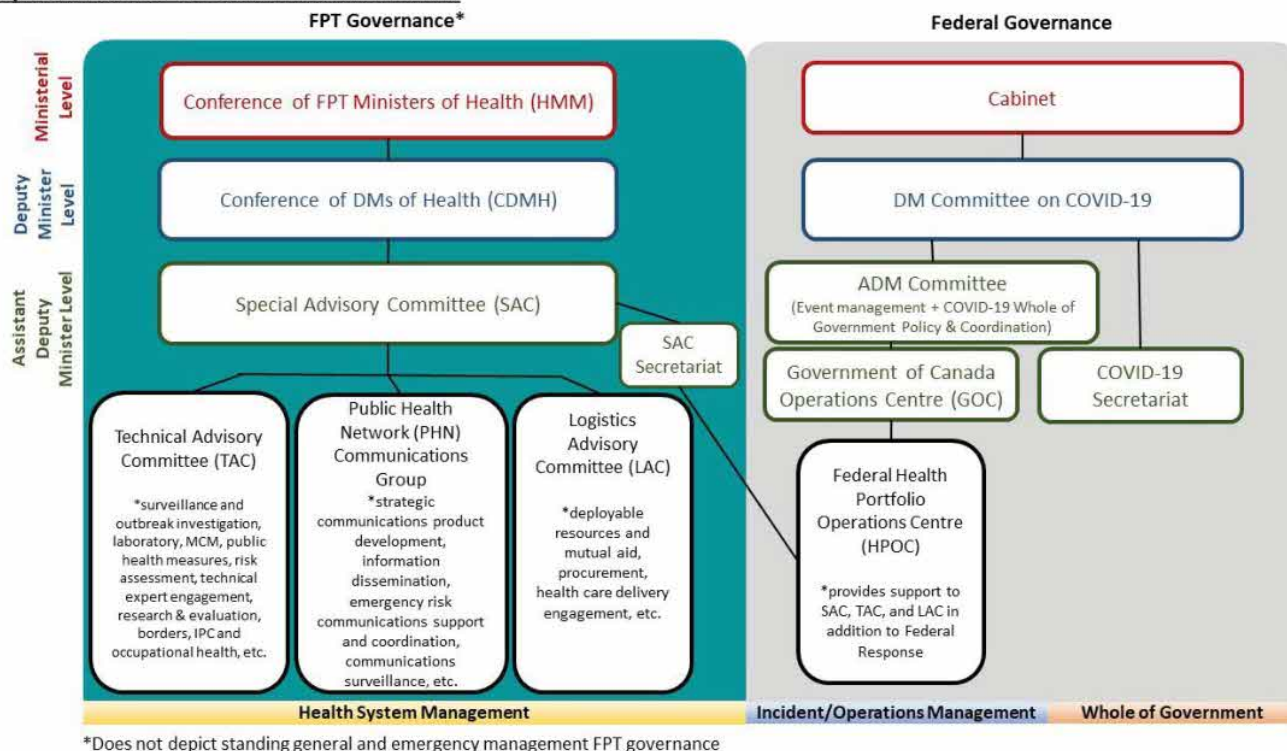
As public health in Canada is an area of shared jurisdiction, federal, provincial and territorial health officials and experts are working together through the *Special Advisory Committee (SAC) on COVID-19* and its various expert committees and working groups to ensure a coordinated and effective response to the COVID-19 outbreak in accordance with the *F/P/T Public Health Response Plan for Biological Events*. The Plan, which includes a summary of F/P/T roles and responsibilities in a public health emergency, can be found at <https://www.canada.ca/en/public-health/services/emergency-preparedness/public-health-response-plan-biological-events.html>

The SAC draws on the pan-Canadian Public Health Network (PHN) structure. Established in 2005, the PHN reflects lessons-learned from the Severe Acute Respiratory Syndrome (SARS) outbreak, which highlighted the imperative for a proactive and collaborative approach to public health emergency planning and response in Canada. PHN has since proven its value and effectiveness as a vehicle for collaborative leadership during the 2009 H1N1 pandemic, Middle Eastern Respiratory Syndrome (MERS-CoV) and Zika outbreaks.

SAC comprises members of the PHN Council and the Council of Chief Medical Officers of Health (CCMOH). Three expert groups comprising senior F/P/T officials and public health experts from across the country support SAC:

- Technical Advisory Committee (TAC): monitors COVID-19 epidemiology, shares information and advises on technical issues through the development of recommendations, guidelines and protocols.
- Logistics Advisory Committee (LAC): supports logistics (e.g., supplies, joint procurement, scarce resources), shares information and advises on logistical issues through the development of recommendations, guidelines and protocols.
- Public Health Network Communications Group: supports consistent and coordinated public communications and messages on COVID-19 across jurisdictions.
- Public Health Working Group on Remote and Isolated Communities supports Indigenous public health response in remote and isolated Indigenous communities.

Graphic 1: COVID-19 Governance Structure



Graphic 1 – Text Description

This graphic depicts two main hierarchical governance structures and linkages between the two particularly at the working level. The structure on the left side of the graphic on the teal background shows the Federal/Provincial/Territorial Governance structure that has been activated for the COVID-19 response as per the Federal/Provincial/Territorial (F/P/T) Public Health Response Plan for Biological Events. There is an asterisk linked to text to remind the viewer that this does not depict standing general and emergency management F/P/T governance. At the top of this structure is the Conference of FPT Ministers of Health (HMM) which operates at the Ministerial level. Directly below the HMM is the Conference of Deputy Ministers of Health (CDMH) which operates at the Deputy Minister level. Directly below the CDMH is the Special Advisory Committee (SAC) which is considered to operate at the Assistant Deputy Minister Level. Below the SAC are 3 committees/groups and a brief description of the types of response issues they lead on from a F/P/T public health response perspective. The Technical Advisory Committee (TAC) reports up to the SAC and leads on: surveillance and outbreak investigation, laboratory, medical countermeasures (MCM), public health measures, risk assessment, technical expert engagement, research & evaluation, borders, infection prevention and control, and occupational health, etc. The Public Health Network (PHN) Communications Group, also reports to SAC and leads on: strategic communications product development, information dissemination, emergency risk communications support and coordination, communications surveillance, etc. The Logistic Advisory Committee (LAC) is the third main group that reports to SAC and leads on: deployable resources and mutual aid, procurement, health care delivery engagement etc. This entire FPT governance structure has a health system management perspective/focus, as is indicated in a yellow bar spanning the bottom of this side of the graphic.

On the right side of the graphic on a grey background is the Federal Governance structure which has more of an incident/operations management and whole of (federal) government focus. At the top of this structure is the Cabinet which like the HMM on the left (FPT side) operates at the Ministerial Level. Reporting up to Cabinet is during this response is the Deputy Ministers Committee on COVID-19, which operates at the Deputy Minister Level and is directly supported by an Associate Deputy Ministers Committee (that oversees federal event management

and the COVID-19 whole of government policy and coordination) and the COVID-19 Secretariat. These two groups along with the Government of Canada Operations Centre (GOC), operate at the Assistant Deputy Minister Level. The Federal Health Portfolio Operations Centre (HPOC), which is linked to the GOC, provides support to the SAC, TAC and LAC in addition to the federal response. The HPOC formally links to the SAC via the SAC secretariat which functions as is a key linkage point between these two governance structures. At the working level the HPOC Incident Management Structure (IMS) includes groups that develop F/P/T response products and support the TAC, LAC PHN Communications Group and SAC.

The Government of Canada has also established a Cabinet Committee on the federal response to COVID-19 that meets regularly to ensure whole-of-government leadership, coordination, and preparedness for a response to the health and economic impacts of the virus.

FPT Collaborative Agreements: Mutual Aid, Information Sharing and Emergency Supplies

Federal/Provincial/Territorial Public Health Response Plan for Biological Events: is a federal, provincial, and territorial (F/P/T) guidance document that provides an overarching governance framework to ensure a coordinated intergovernmental health sector response to public health events that are biological in nature and of a severity, scope or significance to require a high level, coordinated F/P/T response.

Canadian Pandemic Influenza Preparedness: Planning Guidance for the Health Sector (CPIP): is an F/P/T guidance document that outlines how jurisdictions will work together to ensure a coordinated and consistent health-sector approach to pandemic preparedness and response. While CPIP is specific to pandemic influenza, much of its guidance is also applicable to other public health emergencies. CPIP consists of a main body, which outlines overarching principles, concepts, and shared objectives, as well as a series of technical annexes that provide operational advice and technical guidance, along with tools and checklists on specific elements of pandemic planning. CPIP is regularly updated to reflect new evidence and best practices.

Operational Framework for Mutual Aid Surge Requests for Health Care Professionals: is a guidance document that provides for a consistent and timely pan-Canadian approach to inter-jurisdictional health care professional mutual aid during health emergencies. The framework identifies roles and responsibilities and provides standard processes to guide jurisdictions making requests for, and offers of, mutual aid and the mobilization/demobilization of health care professionals. It also informs a complementary *Memorandum of Understanding (MOU) on the Provision of Mutual Aid in Relation to Health Resources During an Emergency Affecting the Health of the Public*.

Multilateral Information Sharing Agreement (MLISA): is a legal agreement that establishes standards on sharing, usage, disclosure and protection of public health information for infectious diseases and public health emergencies of international concern. The MLISA sets out what public health information is to be shared and how it will be used. It allows for trends and/or urgent public health events to be identified more rapidly and to reduce duplication of information requests. MLISA also informs an *FPT MOU on the Sharing of Information during a Public Health Emergency*. The Memorandum of Understanding (MOU) provides a framework for the sharing of information between and among its signatories during public health emergencies.

National Emergency Strategic Stockpile (NESS): contains supplies that provinces and territories can request in emergencies, such as infectious disease outbreaks, natural disasters and other public health events, when their own resources are not enough. These include a variety of items such as medical equipment and supplies, pharmaceuticals and social service supplies, such as beds and blankets.

Public Health Ethics Framework: A Guide for Use in Response to the COVID-19 Pandemic in Canada: is a framework intended for use by policy makers and public health professionals making public health decisions in the context of COVID-19. Section 1 articulates ethical principles and values for public health authorities to consider, and Section 2 sets out a framework to help clarify issues, analyse and weigh relevant considerations, and assess options, in order to support decision making in real situations.

Federal Emergency Response Plans

The Federal Emergency Response Plan (FERP): is the Government of Canada's all-hazards response plan. The FERP outlines the processes and mechanisms required to facilitate a whole-of-government response to an emergency. The FERP is designed to harmonize federal emergency response efforts with the efforts of PT governments, non-governmental organizations (NGO) and the private sector.

The Federal Policy on Emergency Management (FPEM): promotes an integrated and resilient whole-of-government approach to emergency management planning, which includes better prevention/mitigation of, preparedness for, response to, and recovery from emergencies. It provides direction to federal institutions on mandate-specific all-hazards risk identification and management within a federal institutions area of responsibility.

International Response Plans and Protocols

North American Plan for Animal and Pandemic Influenza (NAPAPI): outlines how Canada, the United States and Mexico intend to strengthen their emergency response capacities, as well as trilateral and cross-sectoral collaborations and capabilities, in order to assist each other and ensure a faster and more coordinated response to outbreaks of animal influenza or an influenza pandemic. The NAPAPI complements national emergency management plans in each of the three countries.

Global Health Security Initiative (GHSI): is an informal, international partnership among like-minded countries and organizations to exchange information and coordinate practices within the health sector to strengthen public health preparedness and response globally, including pandemic influenza.

International Health Regulations (IHR): represent an international agreement between all World Health Organization (WHO) Member States to build capacity to detect, prevent, assess, notify and response to public health events. Canada has a legal obligation to meet the core public health capacities set out by the IHR.

World Health Organization (WHO) Strategic Response Plan: outlines the public health measures that the international community stands ready to provide to support all countries to prepare for and respond to COVID-19. The document (published February 3, 2020 and updated on April 14, 2020) takes what has been learned so far about the SARS-CoV-2 virus and translates that knowledge into strategic action that can guide the efforts of all national and international partners when developing context-specific national and regional operational plans.

Appendix 2: Modelling Support for Forward Planning

Modelling recreates the essential components of pathogen transmission cycles from our understanding of the biology of the pathogens and their interactions with their hosts. Models help to predict where and when infectious diseases may emerge or re-emerge, and they can be used to explore the best methods or combinations of methods to control disease outbreaks or epidemics and protect the health of Canadians. For response to COVID-19, there are three broad types of model being used:

1. Deterministic compartment models. These are Susceptible-Exposed-Infectious-Recovered (SEIR) type dynamic models in which the population is divided into “susceptible”, “exposed”, “infectious” and “recovered” classes. After encountering infection, individuals in a population move from one state to the next. This basic structure includes elements to model SARS-CoV-2 and impacts of public health measures, with more realism. These elements include compartments for isolated cases and quarantined “exposed” contacts from which onward transmission to susceptible people is limited or absent, compartments for asymptomatic cases that may or may not be detected by surveillance, as well as flows to “isolation” and “quarantine” compartments that allow variation according to different levels of public health effort. These models are used to inform broad policies at a national level, including i) estimating numbers of cases, hospitalisations and deaths; ii) estimating the effects of non-pharmaceutical interventions (NPIs), (physical distancing, case detection and isolation, and contact tracing and quarantine), iii) design of vaccination programs; and iv) the design of programs to enhance “herd immunity” via use of antivirals/therapies if vaccines prove ineffective.
2. Agent-based models. These are also SEIR models, and they can also be used to inform development of national strategies. However, because they can simulate disease transmission with some detail in and amongst homes, work places leisure spaces etc., they are particularly useful for decision-making at an individual community level regarding needs for NPIs, and strategies for relaxing restrictive closures.
3. Branching models. These are a more recent addition to the types of models used for COVID-19. They simply assess what factors cause single chains of transmission to expand or become extinct. They are being used to assess the needs for controlling transmission in work places and institutions.

The PHAC has developed models that can be shared, and are constantly undertaking modelling to support decisions. The PHAC External COVID-19 Modelling Expert Group was formed in February 2020, and currently comprises 33 members from 21 universities across Canada, as well as 43 members from other Federal departments/organisations provincial/territorial public health organisations. The group comprises the majority of infectious disease modelling group leads in Canadian universities, and is capable of supporting modelling needs for decision-making.

Appendix 3: COVID-19 Response Planning with Indigenous Communities

A summary of response activities for Indigenous Communities, including the work of SAC's FPTI Public Health Working Group on Remote and Isolated Communities, that have been supported by Indigenous Services Canada (ISC) and the F/P/T response partners to date include:

- **Preparedness:** Resources to support pandemic planning updates/activation; access to medical supplies and PPE; training; and, guidelines.
- **Health Human Resources:** Resources to support surge capacity for health human resources, including nursing, medical and paramedical supports; as well as, charter services to get health human resources into communities with reduction to commercial airline service.
- **Infrastructure:** Resources to procure temporary shelter solutions and to support communities in efforts to re-tool existing spaces to offer safe assessment and overflow space; and, additional surge supports for food, water and other supply chain components.
- **Infection prevention and control (IPC):** Shared information (i.e., public health measures and promoting personal health measures for individuals and health providers), training and increasing capacity to support community response, including public service announcements in Indigenous languages. Provided training of community workers and health providers on IPC. Funded communities and service providers to increase their capacity for infection prevention and control, including First Nations-run schools, boarding homes, family violence shelters and friendship centres.
- **Medical transportation:** Supported medical transportation or adapting its policies (i.e., to use private modes of transportation where possible for those with higher risk factors) to minimize transmission; and, offered IPC support for service providers such as boarding homes.
- **Governance:** Worked with Indigenous partners, the Public Health Agency of Canada (PHAC), Health Canada, Public Safety's Government Operations Centre, and other departments, as well as their provincial and territorial counterparts for a coordinated and consistent Canadian approach to COVID-19 to protect the health and safety of First Nations, Inuit and Métis communities.
- **Communications and Surveillance:** Developed and broadly disseminated communication messaging through Department's COVID-19 Single Window to networks with Public Service Announcements in multiple Indigenous languages. Used digital media to further reach stakeholders with communications such as public health measures. Multilateral calls with partners at the national and regional levels.
- **Monitoring:** Adapted the Department's flu surveillance tool to track COVID-19 across First Nations communities; and developed a tracking tool to develop dashboards on key indicators of COVID-19.

Based on knowledge and feedback learned to date, ongoing preparations needed to support Indigenous populations to respond to a possible fall resurgence include continued planning and logistics that support food security; and, also medical supplies, including PPE, needs of communities and off-reserve Indigenous organizations providing essential services. Continued access to timely testing supplies, P/T labs for processing, and results, including point of care testing for northern, remote and isolated communities. There is also a need to plan for reduced flight schedules, which can create supply chain challenges for food, medical supplies, and health human resources reaching communities; and for communities to send swab tests taken for processing at PT labs.

Additional refresher training in infection prevention control is required to support health professionals and communities, for example in donning and doffing PPE and environmental cleaning practices to

reduce the spread of COVID-19. In addition to supporting training for health human resources working in communities, increased funding for telemedicine and virtual health care providers is required to support ongoing health service delivery, and to avoid a potential backlog in appointments following the pandemic or worsening health conditions.

Access to care to treat more severe symptoms of COVID-19 in remote and isolated communities also requires that ongoing arrangements, or new ones, are in place to ensure an adequate number of beds in hospitals south of 60, to support the treatment of Indigenous peoples living in northern, remote and/or isolated communities without this type of service. In communities where there are long-term care facilities, or Elders residences, it is important to have access to adequate resources to support their planning in keeping Elders safe and healthy – this includes funding to take basic infection prevention control measures (i.e. PPE, high dose flu vaccine, cleaning supplies, etc.), to engineered and more administrative public health measures.

A distinctions-based approach has been adopted by the Federal Government to ensure that the unique rights, interests and circumstances of the First Nations, the Métis Nation and Inuit are acknowledged, affirmed, and implemented. In this context, it takes into account the cultural and socio-economic particularities of each of the Indigenous Nations involved. Distinctions-based, Indigenous-led analysis of this information is necessary to advancing culturally appropriate and science-based approaches, for First Nations, Inuit and Métis Nation communities. Learning from H1N1, we know that long standing public health gaps and health disparities between First Nations and non-Indigenous Canadians increase the likelihood and potential severity of a coronavirus disease outbreak in Indigenous communities. These disparities are often exacerbated in remote or fly-in communities, where access to necessary supplies and health care services is limited as compared to non-Indigenous communities. We also know that in H1N1 data for First Nations/Inuit/Métis populations were not captured in a consistent way, or a way that supported communities in their preparedness and response efforts.

Surveillance activities are critical to informing public health responses to a pandemic. They support the early detection and description of potential health threats present in Canada, including on-reserve First Nations communities. In order to be able to make informed decisions, decision makers and leaders throughout the system need reliable public health data. Existing data quality and gaps for First Nations, Inuit and Métis populations living both on and off reserve are critical to effectively responding to future waves of COVID-19 among this population, protecting their health and safety by getting them the access to care required.

The strategy/approach, actions and deliverables for these preparations for the short, mid and long-term (i.e., being before September, September to December, and 2021 and beyond, respectively) include:

Short term: In the short term, ongoing work to continue to secure medical supplies & PPE are necessary, both to support future waves of COVID-19; and, to support the return of services in communities (i.e. immunization, water monitoring, treatment for substance use, etc.). Access to point of care testing is vital to supporting the safe reopening of northern, remote and/or isolated communities and continued work to advocate for access to test cartridges available on GeneXpert machines, and for new point of care technologies when approved will continue. Flu and pneumococcal vaccine planning, from securing vaccines, working with PTs on vaccine strategies, mobile clinics, etc. as well as planning for flu vaccine mass immunization strategies in light of COVID-19, and potential space limitations in communities, leading to prolonged clinics to allow for appropriate physical distancing, regular disinfection of spaces,

etc. Ongoing monitoring of forest fires for possible evacuations and planning in light of COVID-19 over the summer and fall months.

Medium term: Ongoing access to funding to support food security, working with Transport Canada and Agriculture and Agri-Food Canada essential. Access to required PPE for Inuit, Métis and off reserve First Nations organizations providing new services as an interim measure to respond to COVID-19 and links with local public health authorities and the Public Health Agency of Canada required to support these services and population. Access to care and planning for the availability of hospital beds required to support possible influx of Indigenous patients requiring care for more severe symptoms of COVID-19. Resources needed to bolster long-term care in communities and mental wellness supports to address impacts associated with pandemic and isolation; as well as, ongoing substance use (i.e. opioid, crystal meth, etc.). COVID vaccine prioritization and deployment strategy planning for First Nations, Inuit and Métis populations.

Longer term: Resources to support Indigenous-led data collection/governance/infrastructure to support data optimization for the longer term in Canada is essential. Resources to bolster community-led public health supports and work are required, as well as training to support these functions. To support access to patient care, as well as the work of community based workers and nurses in northern, remote and/or isolated communities increased funding for telemedicine and virtual health care providers is necessary. This will avoid a backlog of medical or specialist appointments after COVID-19, and support access to timely care supporting better health outcomes.

High level signals that would necessitate a change in timelines or strategy/approach and sub-sequent actions and deliverables, include:

- ongoing and prolonged active cases – either slow, or in an outbreak scenario on reserve
- signals and risks of community spread, where communities may be at a higher risk due to geographic location
- access to health care to treat more severe symptoms
- strain on system for medivacs should there be a greater need in PTs
- shifts in hospitalization rate, ICU admission rate, case fatality rate
- reproductive rate
- Long-term care (LTC) outbreaks
- shift in age/sex distribution of cases

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