

Coronavirus COVID-19

BC Ministry of Health



Management of COVID-19: Health Sector Plan for Fall/Winter 2020/21

September 2020

Table of Contents

EXECUTIVE SUMMARY	3
OVERARCHING GOAL	7
PRINCIPLES	9
HEALTH SYSTEM RESTART AND STRATEGIC PLAN	9
ACTIONS	11
HEALTH SYSTEM PLAN FOR FALL/WINTER 2020/21 – MANAGEMENT.....	11
PLANNING AND CO-ORDINATION	11
MODELLING AND ANALYSIS.....	14
Health System Operational Modelling	20
HEALTH SERVICES KEY ACTIONS.....	38
PUBLIC HEALTH STATUS AND ACTION	38
PRIMARY CARE AND MEDICAL SPECIALIST CARE	39
COMMUNITY CARE SERVICES	40
PATIENT TRANSPORTATION (B.C. EMERGENCY HEALTH SERVICES/REGIONAL HEALTH SERVICES).....	42
LABORATORY TESTING CAPACITY	42
HOSPITAL CAPACITY & SERVICES	43
SUPPORTIVE ORGANIZATIONAL INFRASTRUCTURE	45

Executive Summary

This plan sets out the proposed actions to the health system for the fall/winter period of 2020/21. These actions include efforts to sustain the health system restart of health services after the spring phase of the COVID-19 pandemic and to manage the ongoing pandemic over the coming months. The action plan builds on an analysis and modelling of both potential COVID-19 transmission and projected overall seasonal health care demand against health system capacity.

The safe health system restart focused on services that had been temporarily reduced or stopped during the spring. Of significance was the surgical renewal, but it also included ensuring critical health care needs were being adequately met after the impact of the spring phase of COVID-19. The Ministry of Health's intention for the fall is to sustain the focus on the broader set of health system services. In addition, the Ministry of Health is refocusing on the operational and strategic actions of the health sector, as set out in the Ministry of Health 2020/21 Service Plan and health authority executive mandate letters to improve health system performance, many of which were slowed down or stopped during the spring.

The health system plan for the fall/winter 2020/21 management of COVID-19 builds on the cautious lifting of restrictions. The Ministry of Health has established a COVID-19 Response and Health Emergency Management Division at the ministry and seven health authority Pandemic Planning and Management working teams focused collectively on enhanced co-ordination, collaboration and data sharing between the actions of the ministry and regional health authority to effectively manage the COVID 19 response through the end of 2020/21. This effort will include continued engagement with health-care professionals, service providers, health associations and unions.

From a public health perspective there will be three key areas of ongoing focus:

- Building out access to testing capacity for up to 20,000 tests per day for the mid-fall through winter when there is a higher prevalence of flu and colds in the community, and an increased need to quickly and accurately assess positive COVID-19 cases.
- Increased contact tracing and case management capacity by adding up to an additional 600 contact tracers over the early part of the fall.
- An enhanced fall flu immunization campaign, with close to two million doses available.

These actions will continue to be underpinned by efforts to maximize individual and population engagement in maintaining essential control measures: appropriate physical distancing; wearing face coverings in settings where physical distancing is not possible; regular hand and respiratory hygiene; and seeking out testing, collaborating with contact tracing, and self-isolating when needed. While continuing to take these measures are important for all individuals in B.C., they will be especially important for professionals and staff across the health, social, and teaching sectors. Public health will enhance guidance as needed for commercial, public and domestic settings to reduce virus transmissions indoors as the fall and winter season approaches.

From a health system perspective, the focus will be to ensure access to quality primary, community, and hospital care (hospital, ICU/HAU, ventilator care) for both non-COVID-19 and COVID-19 patients, as required. The focus builds on refreshed modelling of supply and demand for inpatient critical care and medical beds. This work includes restating potential supply and demand calculated by using normal seasonal demand (including the impact of a full flu season), and the additional inpatient surgical demand due to the surgical renewal plan.

Modelling COVID-19 critical care and acute medical care bed requirements has been completed for four scenarios using the B.C. spring experience of COVID-19 pandemic for practical planning purposes, plus a theoretical high++ transmission scenario as a reference stress test for the health system to be used for contingency planning:

1. **Low COVID-19 cases** (this mirrors the June situation, with low numbers of daily new cases and admission; represents a minimal number of COVID-19 beds required among a limited number of sites).
2. **Moderate COVID-19 cases** (increasing transmission, resulting in a moderate number of COVID-19 cases and admissions).
3. **High COVID-19 cases** (the number of COVID-19 new cases and admissions mirrors the March-May pandemic high point levels).
4. **High++ COVID-19 case** (the number of COVID-19 new cases and admissions mirrors an extreme scenario with twice as many cases as during the March-May pandemic experience)

The acute care hospital services platform will again focus on the readiness of the assigned COVID-19 bed capacity across 19 hospital sites and only in an extreme circumstance moving to use additional hospital capacity across the remaining hospital sites. This approach will be further supported by work underway to ensure a responsive patient transportation and support service in rural areas of the province.

Overall, and as set out in spring 2020, the B.C. health system has adequate physical capacity to meet demand while knowing that we can successfully implement more extreme hospital access measures if required. This includes proactively adding available surge capacity over the fall to inpatient medical and critical care beds. Implementing surge capacity requires a continued focus on strengthening health human resources – hiring, training, and effective deployment will continue to be a key priority over the fall. In addition, learning from the spring experience, over this fall and winter there would be a staged and regional approach to managing any significant surges in demand in contrast to the system wide reduction in hospital bed occupancy used in March 2020. This staged approach will be managed through the COVID-19 Response and Health Emergency Management network.

In addition, over the fall/winter period, the overall health system capacity will be further strengthened by a suite of additional measures to reduce normal historical demand on inpatient medical bed use focused on flu transmission suppression and a range of actions across the different sectors of the health system:

- A key driver of historical demand on inpatient bed use during the late fall and winter months is the influenza season, which should be impacted positively by the physical distancing and other transmission control measures in place for COVID-19 and the enhanced fall influenza immunization campaign noted earlier.
- A range of other health system actions will be implemented during the fall to further strengthen capacity:

Protecting Vulnerable Seniors in Long-Term Care:

- Fluzone-High Dose immunizations will be made available to all long-term care and assisted living residents as part of the fall immunization strategy.
- Robust infection prevention and control practices across all home care, assisted living and long-term care facilities with approximately and additional 2,000 staff.
- Substantive recruitment and training strategy to fill approximately 2,000 vacancies and for an additional 3,000 health care aides, cleaning and food service staff across the long-term care homes.

Protecting Those at Higher Risk in the Community through Primary and Medical Specialist Care:

- Community patient care guidelines and practices for COVID-19 patients including rapid referral pathways to higher levels of care as required.
- Operational and patient care clinical guidelines including the use of virtual care focused on health and safety for older patients and/or individuals more likely to experience a serious form of the illness due to underlying chronic medical conditions (cardiac, diabetes, renal, respiratory, cancer, compromised immune system).
- Use the urgent and primary care centres and other designated primary care clinics as “respiratory care centres” for the coming fall/winter flu/COVID-19 season as required to enhance access to testing capacity and community care. These will be enhanced by drive through sites for testing if required.
- Risk mitigation strategies to counter an increasingly contaminated and toxic illicit drug supply to help prevent overdose events.
- Robust infection prevention and control practices across services to vulnerable populations being housed in provincial shelters and congregate housing during the COVID-19 pandemic.

Improved Patient Transportation and Access to Care in Rural/Remote Areas:

- Implement the announced Rural, Remote and Indigenous Community Framework to provide increased access to in-community testing, and timely access to primary and urgent hospital care through emergency ground and air ambulance transportation.

Increased Assessment and Laboratory Testing Capacity:

- Gradual increase COVID-19 NAT assessment and testing capacity across health authorities to approximately 20,000 daily capacity by mid-fall, including testing for flu.

Strengthen Hospital Capacity and Services:

- Robust hospital infection prevention and control practices across all hospital sites.
- Actionable plans in place to implement additional surge-bed capacity across hospital sites as required to meet demand.
- Hospital COVID-19 preparation across all hospitals, with a specific focus on specific management strategies across the 19 primary COVID-19 management sites as follows:
 - Emergency departments establish COVID-19 and routine care pathways (respiratory/non respiratory);
 - Safe visitor policies;
 - COVID-19 “cohorted” wards;
 - Critical care and ventilator management (ICU/High Acuity Units); and,
 - Prototype hospital-at-home model along with other measures to reduce inpatient medical bed demand.
- Ongoing focus on building and strengthening health human resource capacity across hospitals for COVID-19 readiness.

Adequate Personal Protective Equipment:

- Additional funding and ongoing efforts to source and strengthen reliable supply chain and build out on-hand capacity of personal protective equipment (PPE) for mid-fall/winter.
- From March to the end of August, the following PPE has arrived in B.C.:
 - Over 6,300,000 N95 or equivalent respirators;
 - Almost 50,500,000 surgical or procedure masks;
 - Over 2,600,000 pieces of eye protection, including goggles and face shields;
 - Over 90,000,000 pairs of gloves; and,
 - Almost 8,000,000 gowns.

The Ministry of Health has been provided an additional \$1.6 billion to support this action plan for 2020/21. This includes approximately \$850 million for several initiatives already announced (including increased contact tracing staff, the enhanced rural remote transportation framework, single-site staffing, surgical renewal and increased spending for personal protective equipment).

Overarching Goal

COVID-19 had a significant impact on the operational and strategic agenda of the health sector. An important action following the first wave of the COVID-19 pandemic was the safe restart of the parts of the health system where services were temporarily reduced or stopped during the spring. Sustaining the health system restart through the fall/winter of 2020/21 is a key overarching goal.

As B.C. moves to its next and new phase in responding to and managing the COVID-19 pandemic, the overarching goal is to find the right balance for B.C. against five objectives that recognize that physical, emotional, social and economic health rise and fall together:

Minimize

1. Protect lives by suppressing the transmission rate to the lowest rate possible for at-risk populations, until a vaccine and/or effective drug therapies become available. Ongoing monitoring and assessment will be important, and strategies will need to evolve based on what materializes or does not materialize over the coming 12 to 18 months. This is to optimize the capacity of the health-care system to effectively trace and manage transmission.

Manage

2. Make sure the health system is not overwhelmed to the point that it cannot offer quality care to both non-COVID-19 and COVID-19 patients. This requires managing the transmission rate within the capacity of the health system until a vaccine and/or effective drug therapies are available.

Balanced against:

Modify

3. Meeting the very real, ongoing physical health and mental health needs of patients and the population by continuing to focus on supporting optimal health and wellness for all British Columbians.
4. Getting people back to work and rebuilding the economy.
5. Optimizing the social fabric of families and communities.

This plan sets out the steps the health system is taking with the restart of health services following the spring phase of the COVID-19 pandemic, and the steps being taken to respond to the ongoing pandemic through the fall and winter of 2020/21.

The reference points for the restart/refocusing of the health system are the Ministry of Health 2020/21 Service Plan, and health authority board and executive mandate letters.

The starting point for the ongoing management of the COVID-19 pandemic was the cautious lifting of restrictions over the summer to support increased economic, commercial and social activity. It was recognized that as some public health measures were lifted, a higher level of COVID-19 transmission would be unavoidable. The aim is to carefully balance the risks associated with the spread of COVID-19 and actions to manage and control transmission, with the unintended social, economic and health consequences of restrictive public health measures. The need for caution and ongoing collective effort is underscored by the re-surge in transmissions seen across various jurisdictions and in B.C. as restrictions were lifted over the summer months and individuals chose not to follow physical distancing guidelines and controls. Key indicators going forward will be R_t scores, careful monitoring of the weekly cumulative positive cases per 100,000 at a regional level¹; and inpatient hospital use.

Overall, this is a very different starting point than that of February 2020, when the pandemic first presented in British Columbia. In the first phase, B.C. only had external reference points to guide its response (the Province referenced its response to a Hubei-type pandemic, a South Korea-type pandemic and a Northern Italy-type pandemic). The Province now knows its ability to collectively manage the spread of COVID-19 in B.C.'s social and geographic context: we better understand the very serious risk this virus presents to the frail elderly and those with underlying medical conditions; we better understand the percentage of infected patients who will require hospitalization; and, more specifically, access to ICU and ventilator care.

Using B.C. data, experience and current case rates as a reference baseline, the go-forward plan sets out a range of strategies that will be put in place by early- to mid-fall 2020 to strengthen our capacity to respond to increased rates of transmission in a stepwise manner if transmission and, more importantly, hospitalization rates start to rise significantly. This should allow more measured responses than using the sweeping across-the-board measures during the early phases of the pandemic.

¹ This could be expanded to a sub-regional level if numbers warranted.

Principles

- **Scientific and evidence-based decision making** – Decisions to further ease and/or reinstate measures will continue to be based on a clear statement and analysis of current evidence.
- **Co-ordination and Collaboration** – Ongoing strong collaboration and co-ordination across the Ministry of Health and health sector as well as across broader government is key to ongoing success. It is important to maintain the same provincewide, whole-of-government approach and health sector wide co-ordination that has taken us through the first phase of the pandemic. Timely and accurate data and information sharing is critical to understanding the situation across B.C. and is essential to informing efforts.
- **Accountability and Transparency** – There is a strong commitment from the B.C. government to continue to be accountable and transparent with its residents as we manage through the pandemic. There will be continued fulsome public reporting of transmission data, as well as actions to manage the COVID-19 response.
- **Flexibility and Proportionality** – Public health measures and health sector actions should be both flexible and proportionate based on the level of threat and be implemented in a controlled and phased manner based on information that may change over time.

Health System Restart and Strategic Plan

The Ministry of Health will report out on progress against the implementation of restart plans and the reboot of the operational and strategic agenda of the health sector as set out in the Ministry of Health 2020/21 Service Plan and health authority mandate letters, and managed through the Strategy Management Office and the Finance and Corporate Services Division.

The directions set out in these documents are important to the government's core platform commitment to delivering better health services for B.C. residents. The Ministry of Health's strategic focus is:

- Implementing a primary care model that provides comprehensive, co-ordinated and integrated team-based care for patients across the province (Primary Care Division).
- Effective community-based services for seniors that improve health outcomes and reduce hospitalizations. This includes supporting seniors to healthily live independently or with access to linked and co-ordinated team-based supports in the community; increasing digital solutions to better support seniors in the community; improving and strengthening long-term care services to ensure seniors receive dignified and quality care (Health Services Division).

- Effective community services for persons with mental health and substance use issues that will better link and co-ordinate services including health authority delivered services; 811/Health Link, and community-based agencies (crisis lines, not-for-profit support services) and ongoing response to the opioid crisis (Health Services Division).
- Providing timely access to surgical procedures now incorporated into the surgical renewal plan for B.C. (Health Services Division, Surgical Recovery Team).

These strategies link to the broader operational focus of continued improvement in the delivery of health services focused on:

- Effective population health, health promotion, and illness and injury prevention services (Population and Public Health Division).
- Continued improvement of emergency health services, diagnostic, pharmaceutical and hospital services (Health Services Division; Pharmaceutical and Laboratory Services Division).

The overall strategy is underpinned by the need to continue to explore innovative approaches to providing a sustainable publicly funded health-care system that will include: ensuring an effective health human resource strategy that includes the reform of professional oversight by the health colleges; increased use of digital technologies to support health professionals; effective budget management; fulsome reporting and analytics; meaningful and scalable innovation (Health Sector Workforce and Beneficiary Services Division; Health Sector Digital IMIT Division; Finance and Corporate Services Division; Health Sector Information, Analytics and Reporting Division; Partnership and Innovation Division).

The importance of this strategic and operational focus is amplified by the COVID-19 pandemic. The focus will be refreshed in light of the pandemic, including expediting or adding to certain aspects of the plan: effective primary and community-based care that reduces the need for hospitalization; the enhanced use of virtual care in primary, medical specialist care and ambulatory outpatient care provided in hospitals; continuing to strengthen the quality and safety of long-term care; and focused human resource recruitment and training to mitigate surges in demand or increased levels of sick-time due to the impact of COVID-19.

Actions

1. The Ministry of Health Strategy Management Office will co-ordinate the work of ministry divisions and health authorities to action the directions set out in the service plan, mandate letters, and divisional plans. These rebooted plans will focus on the seven months from Sept. 1, 2020 – March 31, 2021. Routine reporting on progress will re-commence starting the end of September.
2. Continue implementation of the surgical renewal plan, including a significant and sustained focus on addressing the surgical backlog, ensuring operational efficiency and adequate health human resources.

Health System Plan for Fall/Winter 2020/21 – Management

Planning and Co-ordination

The Ministry of Health's Strategic Management Office will continue to lead and co-ordinate the routine core health system strategic and operational plan oversight. However, the emergency management approach used to respond to the first phase of the pandemic will shift to a sustained planning and management response that will take the health system through the next twelve months to June 2021.

There will continue to be a strong emphasis on a well co-ordinated provincial strategy and approach to the management of COVID-19 with regional planning and response within the context of the overall provincial strategy. Specifically:

- The provincial health officer and deputy minister of health will continue to provide overall strategic public health and health system operational oversight of B.C.'s pandemic response reporting through to the Minister of Health. They will be supported by an assistant deputy minister (ADM) accountable for COVID-19 response and health emergency management:
 - The Ministry of Health has established a COVID-19 Response and Health Emergency Management Division to ensure an ongoing, focused response to supporting and co-ordinating the health system within the context of COVID-19 over the next 12 months.
 - The ADM will support the ongoing development and co-ordination of the provincial strategy by:
 - Working closely with the provincial health officer and deputy minister of health on overall COVID-19 strategy;
 - Working closely across government ministries on the broader provincial approach to managing COVID-19;
 - Working closely with the provincial health officer and the chief medical health officer's team;

- Facilitating provincial health officer/chief medical health officer input and advice to operational and health service clinical and operational policy direction as required;
 - Being the primary vehicle for the provincial health officer to seek input from health services on the development of provincial health officer guidance or directives related to the pandemic emergency;
 - Being the key interface for the Ministry of Health to request advice and recommendations from BC Centre of Disease Control (BCCDC) into policies and guidelines developed by the ministry to support health and clinical services delivery during the pandemic; and,
 - Working closely with Provincial Health Services Authority (PHSA) Provincial Clinical Policy team who will co-ordinate the development of evolving clinical guidelines for the care of COVID- 19 patients and at-risk patient populations.
- The COVID-19 Response and Health Emergency Management Division will ensure a focused and well co-ordinated provincial and regional approach to the health system’s response to the COVID-19 pandemic over the coming 12 months. Key accountabilities include:

(1) Planning

- Co-ordinate the work of the Ministry of Health’s divisions with respect to COVID-19 actions.
- Co-ordinate the work of health authority Pandemic Planning and Management working teams focused on planning for and managing the COVID 19 response through the balance of 2020/21 at the health authority level within a co-ordinated provincial response.

(2) Analysis and Reporting

- Provide routine analysis and reporting through to the Minister of Health, deputy minister, provincial health officer, Leadership Council and the ministry’s senior leadership team.
- Provide epidemiological and health system analytics and modelling supported by the BCCDC’s Analytics Team; the PHSA Modelling Team; and the ministry’s Health Sector Information, Analysis and Reporting Division.
- Monitor and report on COVID-19 transmission rates, including Rt scores, weekly cumulative cases per 100,00 at a regional level and system capacity metrics:
 - Epidemiological monitoring and reporting will be provided by the BCCDC.
 - Operational data will be provided daily from the health authorities admission discharge transfer and emergency department data feeds.

(3) Logistics

- Monitor and co-ordinate (as necessary) provincial health system efforts to strengthen the supply chain system for personal protective equipment (PPE) and address other supply issues (including lab reagents and components; swabs; needles; cleaning supplies; medications) for the B.C. COVID-19 pandemic response. Key objectives:
 - Maximize at hand PPE supplies as much as possible within the global demand context;
 - Effective PPE testing capacity; and,
 - Implement efficient distribution capacity to meet immediate and potential PPE needs through the fall and winter for the health sector.
- The BCCDC has been a strong asset throughout the spring phase of the COVID-19 pandemic. Through its memorandum of understanding with the Ministry of Health and Office of the Provincial Health Officer, the BCCDC is responsible for:
 - Management of communicable disease threats or outbreaks:
 - As delegated by the provincial health officer, leading and co-ordinating across regions the development and implementation of the communicable disease and outbreak components of the public health system.
 - Planning for, detecting, investigating and responding to emerging pathogens in collaboration with partners, including microbiology/scientific experts.
 - Procuring, monitoring and distributing emergency response biologicals and medications for select communicable diseases, including mass immunization strategy.
 - Ongoing epidemiological dynamic modelling and analysis.
 - As requested by the provincial health officer, providing expertise and advice on the development and implementation of provincial level public health related emergency management guidance and directives.
 - As requested by deputy minister of health and provincial health officer, providing analysis and advice on transmission trends.
 - As requested by Ministry of Health, providing advice and recommendations into ministry policies and guidelines to support health and clinical services delivery during the pandemic.
 - Monitoring of unintended consequences of public health measures against COVID-19 transmission.

Within this mandate, the BCCDC will need to continue and sustain key roles and functions over the fall/winter while restarting its other services that have been partially put on hold during the spring (e.g., population and public health projects; surveillance and management of sexually transmitted disease and blood borne infection programs; opioid and harm reduction programs; immunization and communicable disease projects).

With respect to COVID-19, the BCCDC will provide:

- Knowledge synthesis focused on key topic areas to guide decision-making.
- Ongoing development and review of provincial guidelines for public health management (e.g., contact tracing, case isolation and distancing measures) and support (health human resources, swat team and hotline) to regional health authorities and the First Nations Health Authority.
- Daily provincial surveillance and reporting of cases, clusters and outbreaks, including:
 - A single linked provincial case database with required data input feeds from health authorities.
 - Population health and sero-prevalence surveys.
- Laboratory and testing services, including genomic and outbreak analysis:
 - Expertise in developing testing strategies.
 - Monitoring and reporting on the development and evolution of test technologies.
 - Supporting regional health authorities in the implementation of testing.
- Strategic research, planning and advice.
 - Pandemic clinical guidelines.
 - COVID-19 disease modelling and analysis.
- Logistical services, including: a negative results hotline and contact support for active daily monitoring; capacity to ensure direct follow-up on issues as required (examples from the spring phase of the pandemic include cruise ships, flights, correctional facilities and work camps).
- Maintaining a public source of trusted, accurate and up-to-date information, including:
 - Public-facing documents.
 - Distribution of materials and website updates.

Modelling and Analysis

This section sets out the modelling and analysis that underpins the approach to planning for and managing COVID-19 in the fall/winter, followed by the proposed actions to be taken by the health system.

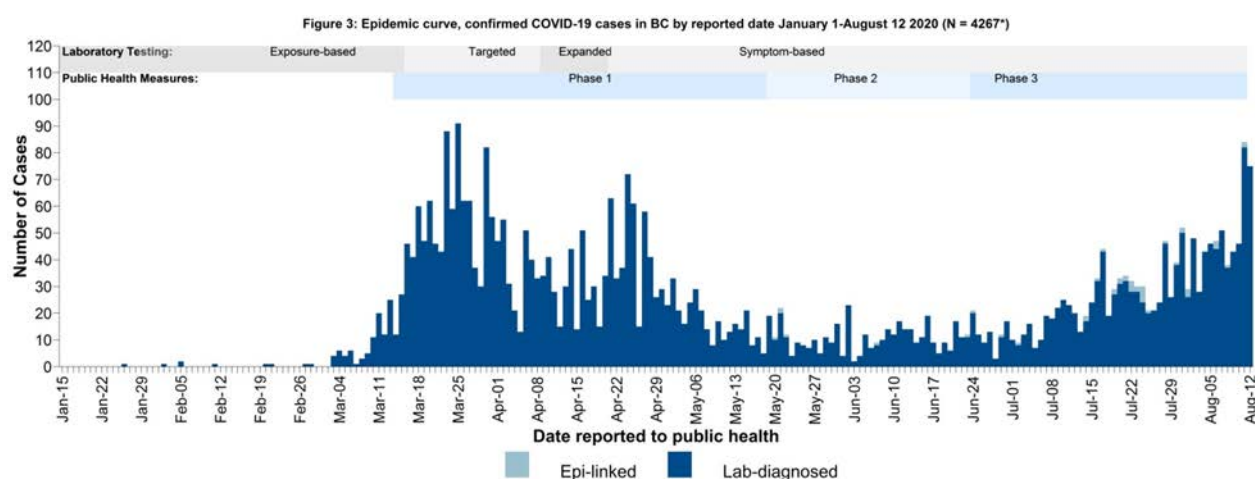
As reported by the BCCDC, as of mid-August, British Columbia reported about 4,300 COVID-19 infections. During the first phase (January 15-May 18), half of those infections were among adults 30 and 59 years of age. Subsequently, the age distribution shifted toward younger adults, with half of infections among adults 20 to 39 years of age during the lifting of restrictions phase from June 24-August 8. In all phases, less than 5% were among children under 10 years of age. Most cases (82%) had a mild, self-limiting illness, while about 1 in 8 required hospitalization and approximately a third of these – or 5% overall – were admitted to the ICU. The highest proportions of hospital and ICU-admitted cases were observed in those aged 60-79 years, representing 42% and 53%, respectively. 69% of deaths were among individuals 80 years and older; the median age of all deaths was 85 years of age.

Of cases with known source information, 1,969 (68%) were acquired through close contact with a known case or cluster of COVID-19 and 362 (12%) were via international travel. During the first wave of COVID-19 transmission, only 567 (20%) of infections were acquired through true community transmission (i.e., no known source). Monitoring the number and proportion of cases with no known source are important as these are better measures of local risk than absolute number of infections.

The BCCDC's use of dynamic compartmental modelling suggested that there would be a gradual increase of transmission due to increased levels of contact following the cautious lifting of restrictions throughout the summer months with the overall increase in levels of interaction. Further, that this increase could be restrained by the control measures that have been put in place to reduce transmission across social interactions whether at home, while travelling, shopping or working.

The emphasis and need for caution and ongoing collective effort is underscored by the re-surge in transmissions seen across various jurisdictions and in B.C. as restrictions have been lifted over the summer months and individuals chose not to follow social distancing guidelines and controls:

Confirmed COVID-19 cases in B.C. by reported date between Jan. 1 - Aug. 12, 2020 (N=4267)



Over the summer months, the transmission infectious rates have consistently been on the very high end of the rates indicated through the compartmental modelling. Although this is still at a low overall rate per 100,000 across all regions, the escalating numbers point to the importance of efforts to reduce transmission.

The need for an ongoing focus on sustaining the hierarchy of infection prevention and control measures (physical distancing, personal health hygiene practices, engineering controls and use of masks) that have formed part of the B.C. pandemic management strategy remains. This will be even more critical during the fall/winter flu season, with increased time spent indoors at home. There will also be the requirement to adequately build out testing capacity for the fall/winter when there will be a higher prevalence of flu and colds in the community with the need to quickly and accurately assess COVID-19 cases, as well as contact tracing and case management capacity to effectively suppress transmission.

In addition, there will need to be an ongoing focus on protecting those patient populations at greater risk in terms of 70+ population (in long-term care, assisted living and the community), along with those with underlying chronic medical conditions (e.g., cardiac, diabetes, renal, respiratory, cancer, compromised immune system).

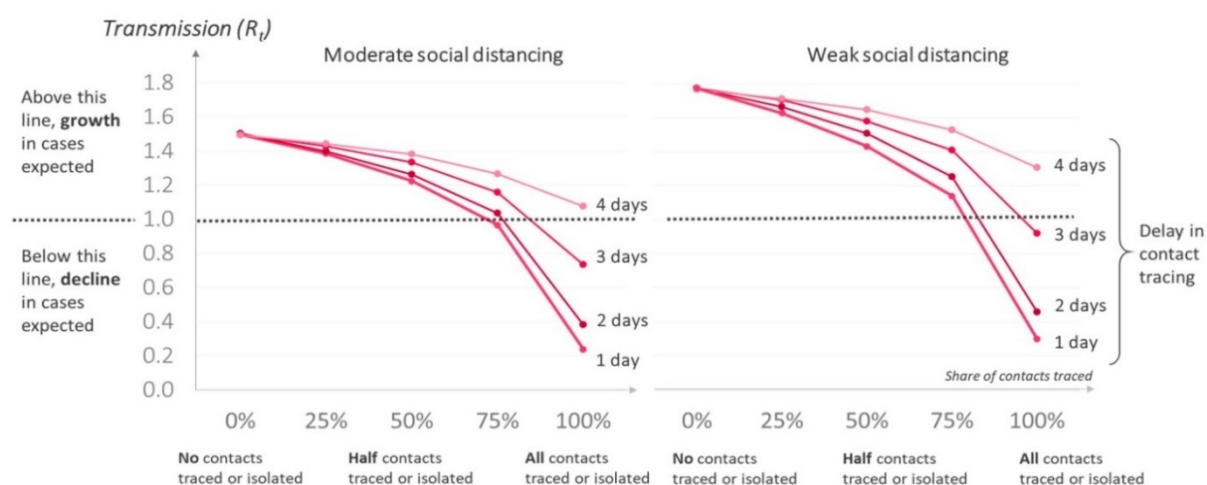
While the dynamic modelling and daily case counts provided a useful framing to think about the importance of social interaction as a driver of transmission, for COVID-19 planning and management purposes in the fall/winter, there will be four key reference points going forward:

1. The reproductive (R_t) number linked with the timeliness and number of contacts traced;
2. The weekly cumulative new cases per 100,000 people at regional health authority level;
3. The age stratification of the new cases; and,
4. The weekly average of inpatient isolation-bed occupancy (this includes COVID-19 positive patients and COVID-19 suspected patients) at the service delivery area hospital level.

In practice, the first three measures should be an indicator of the likely demand on the fourth.²

From a public health perspective, rapid efficient investigation and contact tracing, and effective management of new cases will have a meaningful impact on the reproductive or transmission rate of the virus. From the spring, we know that exponential growth in this number can be managed down within a couple of weeks by strategies that reduce social interaction. However, the objective is to avoid, if possible, switching on and off these more restrictive directives that would significantly impact efforts at business and economic recovery and healthy social interaction by effective testing, contact tracing and case management.

Overall, while it is desirable to have a R_t of less than 1, a R_t of greater than 1 can be mitigated by effective contact tracing and management, and this will be a key part of the forward strategy in to fall/winter:



² According to WHO estimates, 80% of infections are mild, 15% are severe infections potentially requiring hospitalization, and 5% are critical requiring intensive care unit admission. In addition, there is a significant age gradient, with older individuals (predominantly 70+) at greater risk of more severe infection.

These metrics will be carefully monitored and reported retrospectively on a weekly basis throughout the fall and winter. In addition, we will monitor and report: the retrospective weekly new cases per 100,000 people at the regional health authority level³; macro reporting at a regional health authority level of possible acquisition by social or workplace type; and, the age stratification of the new cases by regional health authority.

Contact tracing is a critical function of COVID-19 transmission suppression. It involves trained public health officials interviewing a known infected individual, identifying contacts and advising the exposed contacts to self-monitor for symptoms, self-quarantine as needed, and obtain medical evaluation and treatment as required. The health sector will need to quickly respond to larger singular outbreaks:

- A singular large public exposure.
- A hospital or long-term care/assisted living exposure.
- A community-based business or organizational exposure (workplace, faith-based organization).
- A local community wide outbreak.

Significant capacity has been built up during the spring phase of the COVID-19 pandemic, with over 700 staff (nursing and allied health) assigned to support this function over the spring. Additional capacity will be added to support regional health authorities to meet potential increased demand over the fall/winter and allow the return of permanent staff to their base duties. This capacity may be enhanced by virtual online daily follow-up and integrating digital contact tracing. Potential digital contact tracing applications continue to be assessed.

These three areas of focus will continue to be underpinned by efforts to maximize individual and population engagement in maintaining essential control measures: appropriate physical distancing; wearing face coverings in settings where physical distancing is not possible; regular hand and respiratory hygiene; and seeking out testing, collaborating with contact tracing, and self-isolating when needed. Public health will enhance guidance as needed for commercial, public and domestic settings to reduce virus transmissions indoors as the fall and winter season approaches.

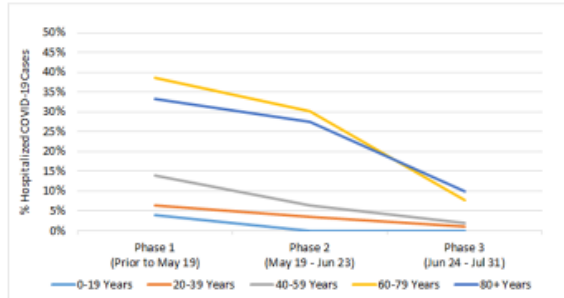
From a health system operation perspective, the key metric is ensuring access to hospital care (hospital, ICU/HAU, ventilator care) for COVID-19 patients as needed. Experience from the spring 2020 phase of the COVID-19 pandemic in B.C. had patients with more severe symptoms being hospitalized early (2-7 days from case identification based on assessment with modelling based on 5 days), resulting in approximately 11% of total confirmed cases being hospitalized (non-critical inpatient care) for between 9-15 days (modelling based on a 12 day stay) and 11% of total confirmed cases being hospitalized (critical care – ICU or HAU) for between 7-10 days (modelling based on 10 days) with a more proactive use of ventilation (80% of cases in critical care being ventilated).

³ Reporting at the sub-regional level of service delivery area or local health area would be possible but not of value when the overall numbers are low.

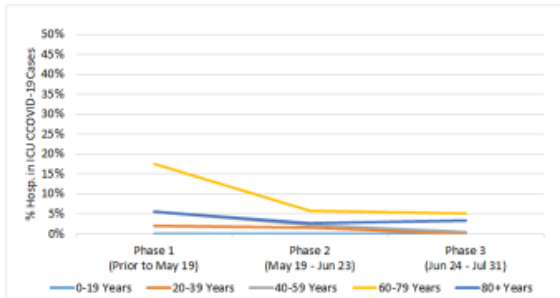
Over the summer, these rates have changed and, in recent weeks, hospitalization rates have not increased in parallel with recent increases in case counts:

COVID-19 Hospitalization Rates

Percentage of COVID-19 Cases Ever Hospitalized



Percentage of COVID-19 Cases Ever in ICU



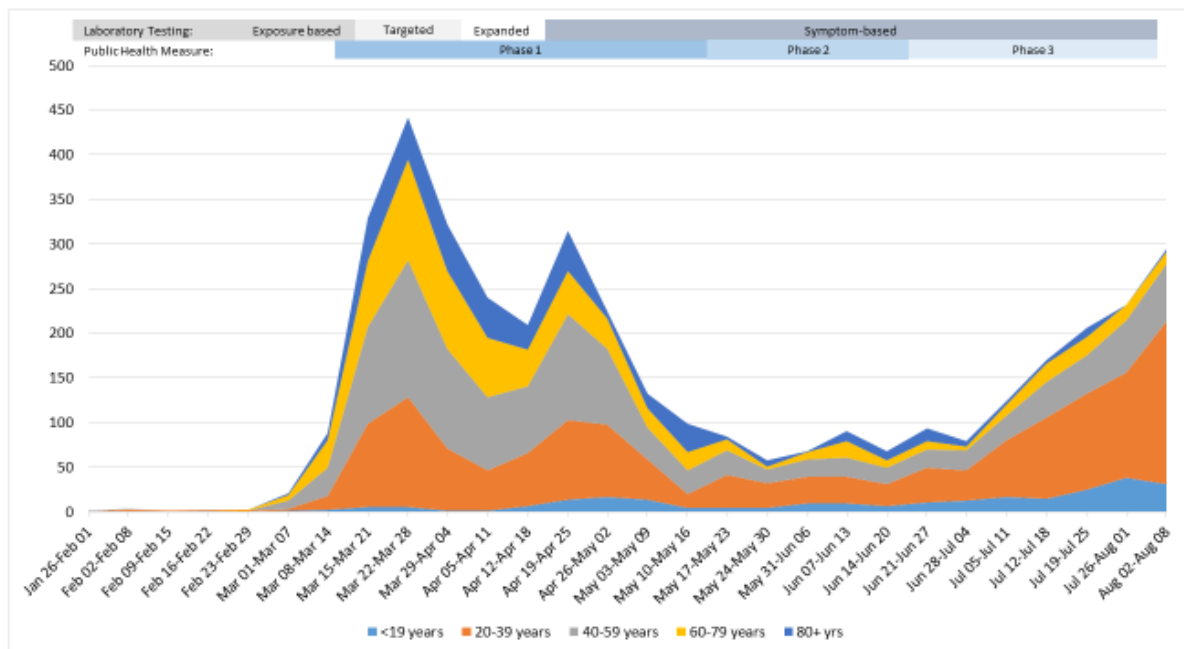
- In Phase 2 some of the case counts are small however, the trend of decreasing hospitalization persists across all age groups over time.
- Timing of Laboratory Testing Strategies:
 - Exposure-based: up until mid-March
 - Targeted: mid-March to early-April
 - Expanded: early-April to mid-April
 - Symptom-based: mid-April onwards

Data Source: BCCDC Surveillance Data; PHSA Provincial Critical Care Management System Jan 26 – July 31, 2020 .

There are likely several factors that impacted these numbers:

- Age distribution of cases has shifted to younger individuals who have lower rates of hospitalization from COVID-19;
- Over time, the higher risk individuals have taken appropriate actions related to social distancing and other control measures that has resulted in less transmission in this age group; and,
- Testing in Phase 1 was limited (sick people asked to stay home and not test), and more severe cases still went to hospital and tested (i.e., severe cases were likely over-represented among reported cases). Testing in later phases became symptom-based (people encouraged to get tested with minor symptoms), resulting in reported cases more likely to reflect larger proportion of true cases and therefore severity among ALL cases decreases.

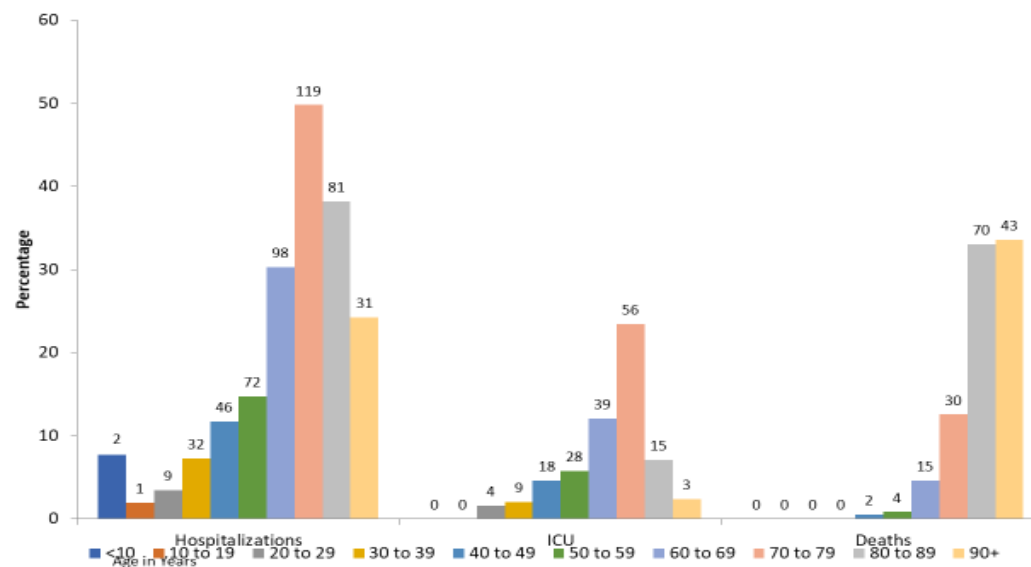
The Age of those Affected by COVID-19



Data Source: BCCDC Surveillance Data; Jan 26 – Aug 8 2020 .

These factors are reflected in the table above – the change in the age of those affected by COVID-19 shifting to younger cohorts who are more likely to have milder symptoms and therefore less likely to require hospitalization (see the graph below). As of the end of August, the hospitalization rates have again begun to slowly increase linked to a slight increase in the older population infected.

Inpatient Medical and Critical Care Bed Use by Age in B.C. (January 1 – May 29)



This shows why monitoring the age stratification of transmission rates is an important indicator of potential hospital inpatient demand. Hospitalization rates will be a core metric for monitoring the capacity of the health system to respond to COVID-19.

These range of metrics set out above provide a reasonable perspective on transmission in B.C. and will continue to be monitored and analyzed on a weekly basis over the fall and winter as we learn to live with COVID-19 with the overarching goal of finding the right balance for B.C. against five objectives set out earlier.

Health System Operational Modelling

Modelling COVID-19 critical care and acute medical care bed requirements has been completed for four scenarios using the B.C. spring experience of COVID-19 pandemic for concrete planning purposes plus a theoretical high+ transmission scenario as a reference stress test for the health system to be used for contingency planning:

1. **Low COVID-19 cases:** This mirrors the June situation, with low numbers of daily new cases and admission. It represents a minimal number of COVID-19 beds required among a limited number of sites – ICU 25/Acute 57 occupancy.
2. **Moderate COVID-19 cases:** Increasing transmission, resulting in a moderate number of COVID-19 cases and admissions – ICU 55/Acute 98 occupancy.
3. **High COVID-19 cases:** The number of COVID-19 new cases and admissions mirrors the March-May pandemic high point levels – ICU 108/Acute 201 occupancy.
4. **High++ COVID-19 cases:** The number of COVID-19 new cases and admissions mirrors an extreme scenario, with twice as many cases as during the March-May pandemic experience as is being used a stress test scenario for contingency planning purposes only – ICU 214/Acute 400 occupancy.

The base number of beds for each scenario builds on the March-April experience for the first three scenarios set at slightly above peak demand. To this base number, we have also added the estimated number of isolation beds required to manage COVID-19 (suspected cases plus positive cases). Both patients with confirmed and suspected COVID-19 require isolation beds. Using spring 2020 COVID-19 data, we know that the average ratio of suspected positive COVID-19 cases during the spring peak was estimated at:

- 25% suspected: positive cases in critical care.
- 50% suspected: positive cases in acute care.

Need for Isolation Beds Linked to the Four Scenarios

	Scenario 1: Low COVID-19 Cases					
	COVID-19 Positive Patients		Suspected Patients		Total Isolation Beds	
	ICU	Acute	ICU	Acute	ICU	Acute
HA						
IHA	3	6	1	3	4	9
FHA	6	12	2	6	8	18
VCHA	5	11	1	6	6	17
VIHA	3	5	1	3	4	8
NHA	2	3	1	2	3	5
BC	19	37	6	20	25	57

	Scenario 2: Moderate COVID-19 Cases					
	COVID-19 Positive Patients		Suspected Patients		Total Isolation Beds	
	ICU	Acute	ICU	Acute	ICU	Acute
HA						
IHA	7	10	3	5	10	15
FHA	14	22	4	11	18	33
VCHA	12	18	3	9	15	27
VIHA	6	10	2	5	8	15
NHA	3	5	1	3	4	8
BC	42	65	13	33	55	98

	Scenario 3: High COVID-19 Cases					
	COVID-19 Positive		COVID-19 Suspected		Total Isolation Beds	
	ICU	Acute	ICU	Acute	ICU	Acute
HA						
IHA	13	20	4	10	17	30
FHA	30	50	8	25	38	75
VCHA	21	35	6	18	27	53
VIHA	14	21	4	11	18	32
NHA	6	7	2	4	8	11
BC	84	133	24	68	108	201

	Scenario 4: High+ COVID-19 Cases					
	COVID-19 Positive		COVID-19 Suspected		Total Isolation Beds	
	ICU	Acute	ICU	Acute	ICU	Acute
HA						
IHA	26	40	8	20	34	60
FHA	60	100	15	51	75	151
VCHA	42	70	12	35	54	105
VIHA	28	42	8	21	36	63
NHA	12	14	3	7	15	21
BC	168	266	46	134	214	400

As of September 1, B.C. was in the Low COVID-19 scenario:

Health Authority	Acute	ICU/HAU
Fraser Health	15	8
Interior Health	0	0
Island Health	0	0
Northern Health	3	1
Vancouver Coastal Health	2	1
B.C. TOTAL	20	10

Against these scenarios, the Provincial Health Services Authority, working with the Ministry of Health, has completed operational modelling of supply and demand for inpatient critical and medical beds using the following working assumptions:

- Majority of COVID-19 cases will be found in Fraser Health and Vancouver Coastal Health.
- There will be less cases in Island Health, Interior Health and Northern Health, but with the challenge of larger geographical area and the inherent challenges of responding.
- That there should be a series of “sequenced proportional responses”/ “lines of defence” if the number of cases increase in the fall/winter rather than a “whole of health system” response.

The modeling, as was done in the spring, starts with establishing potential supply. Demand is then calculated using normal seasonal demand and additional inpatient surgical demand (due to the surgical renewal plan) against supply to assess what additional capacity is likely to be available to meet COVID-19 hospitalization demand for both critical and inpatient medical care.⁴

Hospital Inpatient Bed Capacity (Supply)

There are three primary types of inpatient beds:

1. Critical care beds:
 - Intensive care unit (ICU).
 - High acuity unit (HAU).
 - Other (adult) critical care units (CSICU, CCU).
2. Inpatient (adult) medical/surgical beds.
3. Other beds:
 - Maternity, pediatrics, mental health, rehabilitation, palliative care.
 - Pediatric intensive care, neonatal intensive care.

For the purposes of COVID-19 management, this modelling focuses on critical care and inpatient (adult) medical/surgical bed capacity.

The total number of beds available is a combination of base and surge bed capacity:

- Base – a bed that is physically available and currently in regular operation.
- Surge – a bed that is physically available but, not currently in regular operation.

For the purposes of COVID-19 management, the hospital bed supply has been divided in to two categories:

- 19 primary COVID-19 sites
- the balance of remaining hospital sites

⁴ This capacity will potentially be increased by several proposed measures to reduce inpatient medical demand on hospitals set out later in this paper.

Primary COVID 19 Hospital Capacity (Base Bed Supply)

HA	COVID-19 Site	Hospital	Base Beds			
			ICU	HAU	Critical Care Other	Acute Care
IHA	COVID-19	East Kootenay Regional Hospital	6			71
IHA	COVID-19	Kelowna General Hospital	19		10	412
IHA	COVID-19	Kootenay Boundary Regional Hospital	6			69
IHA	COVID-19	Penticton Regional Hospital	7			148
IHA	COVID-19	Royal Inland Hospital	16		4	238
IHA	COVID-19	Vernon Jubilee Hospital	10			176
IHA	COVID-19	Total HA	64	0	14	1,114
IHA	Other Hospital	Total HA	0	6	0	235
FHA	COVID-19	Abbotsford Regional Hospital and Cancer Centre	8	8	22	262
FHA	COVID-19	Royal Columbian Hospital	16	44	21	321
FHA	COVID-19	Surrey Memorial Hospital	21	20	14	623
FHA	COVID-19	Total HA	45	72	57	1,206
FHA	Other Hospital	Total HA	35	0	0	1,305
VCHA	COVID-19	Lions Gate Hospital	9			233
VCHA	COVID-19	Richmond Hospital	4	4		214
VCHA	COVID-19	St. Paul's Hospital	15		20	393
VCHA	COVID-19	Vancouver General Hospital	50		18	712
VCHA	COVID-19	Total HA	78	4	38	1,552
VCHA	Other Hospital	Total HA	12	6	0	410
VIHA	COVID-19	Nanaimo Regional General Hospital	10			330
VIHA	COVID-19	Royal Jubilee Hospital	11		16	445
VIHA	COVID-19	Victoria General Hospital	9			336
VIHA	COVID-19	Total HA	30	0	16	1,111
VIHA	Other Hospital	Total HA	22	0	0	580
NHA	COVID-19	Fort St John Hospital & Peace Villa	4			44
NHA	COVID-19	Mills Memorial Hospital	4			44
NHA	COVID-19	University Hospital of Northern British Columbia (UHNBC)	10	7		222
NHA	COVID-19	Total HA	18	7	0	310
NHA	Other Hospital	Total HA	9	0	0	218
BC	COVID-19	Total BC	235	83	125	5,293
BC	Other Hospital	Total BC	78	12	0	2,748

- As in the spring of 2020, our first “line of defense” are our 19 COVID-19 sites which will support patients with COVID-19 and keep other inpatient services strong.
- 19 sites identified as COVID-19 sites
 - 3 each in FHA, VIHA, and NHA
 - 4 in VCHA
 - 6 in IHA.
- The COVID-19 sites will manage the COVID-19 patients until a critical mass of COVID-19 patients is accumulated.
- All hospitals can be called upon if the COVID-19 sites as first lines of defense are not sufficient.
- COVID-19 sites represent three quarters (75%) of all ICU beds and 87% of HAU beds; 100% of “other” critical care other beds and 66% of acute care beds.

NOTE: Data Source – Hospital Capacity Data – Health Authority daily census reporting; Bed numbers are reported as of Aug 10th 2020; bed classification and bed numbers will continue to evolve as hospitals refine capacity.

This core base capacity is further strengthened by additional surge capacity for critical care available to the health system when required:

Total Capacity for Critical Care Including Surge Capacity

Health Authority	Service	COVID-19 Sites		Other Hospital Sites	
		Base Beds	Surge Beds ¹	Base Beds	Surge Beds ¹
IHA	ICU	64		0	
	HAU	0	24	6	0
	CSICU/CCU	14	0	0	0
	Total Critical Care	78	24	6	0
FHA	ICU	45		35	
	HAU	72	69	0	7
	CSICU/CCU	57	7	0	0
	Total Critical Care	174	76	35	7
VCHA	ICU	78		12	
	HAU	4	21	6	46
	CSICU/CCU	38	89	0	0
	Total Critical Care	120	110	18	46
VIHA	ICU	30		22	
	HAU	0	89	0	34
	CSICU/CCU	16	0	0	0
	Total Critical Care	46	89	22	34
NHA	ICU	18		9	
	HAU	7	19	0	0
	CSICU/CCU	0	0	0	0
	Total Critical Care	25	19	9	0
BC	ICU	235		78	
	HAU	83	222	12	87
	CSICU/CCU	125	96	0	0
	Total Critical Care	443	318	90	87

¹ Critical Care surge beds include ICU and HAU surge beds. Critical Care Other surge beds include CSICU and CCU beds.

Note 1: PHSA's PICU and NICU numbers are not included in this chart. FHA's HAU, CSICU and CCU numbers may require further refinement based on agreed upon criteria.

Note 2: Across all HA's Pediatric Intensive Care Unit (PICU) or Neonatal Intensive Care Unit (NICU) beds are not included

Data Source: Hospital Capacity Data - Health Authority daily census reporting (Aug 10, 2020).

Supported by an adequate supply of adult mechanical ventilators:

Adult Mechanical Ventilator Capacity

Location	Provincial Pandemic fleet Ventilators	Site Mechanical Ventilators	Total Adult ICU Mechanical Ventilators	Non-COVID-19 Sites Mechanical Ventilators	COVID-19 Sites Mechanical Ventilators
Available	48		48	0	48*
IHA	8	79	87	5	82
FHA	0	187	187	57	130
VCH	0	138	138	5	133
PHC	0	47	47	5	42
VIHA	0	109	109	35	74
NHA	5	33	38	5	33
PHSA	0	48	48	0	48
Total	61	641	702	112	590

Note: Site Mechanical Ventilators include site pandemic fleet and regular inventory.

Note: * denotes Mechanical Ventilators available but not currently assigned to a particular site and which can be moved

Data source: Provincial Biomedical Database – June 19, 2020

Turning to inpatient medical beds, the current total inpatient base bed capacity in B.C. is at 8,041, with 5,239 of those beds being at the COVID-19 sites. There is an additional surge bed capacity of 2,493, with 1,661 specifically for the COVID-19 sites.

Acute Care Inpatient Medical and Surgical Care Base Bed Capacity

March 2020 Capacity		August 2020 Capacity							
Health Authority	Medical and Surgical ¹	Base Beds							
	- All Hospital Sites	All Hospital Sites				COVID-19 Sites			
		Medical and Surgical ¹	Med/Surg Other ²	Other ³	Total Inpatient Beds	Medical and Surgical ¹	Med/Surg Other ²	Other ³	Total Inpatient Beds
IHA	1,007	1,033	107	209	1,349	811	94	209	1,114
FHA	1,447	1,503	449	559	2,511	759	255	192	1,206
VCH/PHC	1,320	1,364	215	383	1,962	1,167	133	252	1,552
VIHA	1,424	1,384	148	159	1,691	894	102	115	1,111
NHA	412	413	30	85	528	220	25	65	310
Total	5,610	5,697	949	1,395	8,041	3,851	609	833	5,293

¹ Excludes maternity, pediatrics, mental health, rehab and palliative care beds

² Med/Surg Other includes maternity and paediatric beds

³ Other includes mental health and rehab beds

The table above presents the acute (non-critical care) bed capacity as of August 2020. For ease of reference, availability of March 2020 is also provided.

As in the case of critical care, inpatient medical beds can be expanded using surge bed capacity. In both instances, the use of surge beds requires planning for the potential deployment of staff through different hospital and/or community health professionals. This was done as a contingency plan during the spring phase of the COVID-19 pandemic and will be repeated for the fall/winter.

Inpatient Base and Surge Bed Capacity

Health Authority	Service	COVID-19 Sites		Other Hospital Sites	
		Base Beds	Surge Beds	Base Beds	Surge Beds
IHA	Medical and Surgical ¹	811	172	222	71
	Med/Surg Other ²	94	6	13	0
	Other ³	209	50	0	0
	Total Acute Care	1,114	228	235	71
FHA	Medical and Surgical	759	250	744	294
	Med/Surg Other	255	140	194	90
	Other	192	47	367	136
	Total Acute Care	1,206	437	1,305	520
VCHA	Medical and Surgical	1,167	656	197	8
	Med/Surg Other	133	53	82	0
	Other	252	65	131	0
	Total Acute Care	1,552	774	410	8
VIHA	Medical and Surgical	894	75	490	119
	Med/Surg Other	102	0	46	0
	Other	115	0	44	0
	Total Acute Care	1,111	75	580	119
NHA	Medical and Surgical	220	121	193	103
	Med/Surg Other	25	18	5	6
	Other	65	8	20	5
	Total Acute Care	310	147	218	114
BC	Medical and Surgical	3,851	1,274	1,846	595
	Med/Surg Other	609	217	340	96
	Other	833	170	562	141
	Total Acute Care	5,293	1,661	2,748	832

¹ Excludes maternity, paediatrics, mental health, rehab and palliative care beds

² Med/Surg Other includes maternity and paediatric beds

³ Other includes mental health and rehab beds

Data Source: Hospital Capacity Data - Health Authority daily census reporting (Aug 10, 2020).

Core Hospital Inpatient Use (Demand)

The general approach to modelling demand was completed by assessing expected usage of hospital beds by health authority using historical admission data (pre-COVID-19) for fall/winter, including the impact of flu-season. To this assessment was added required increased surgical bed capacity based on the surgical renewal. The modelling assumptions are as follows:

- General planning assumptions:
 - Average census is used over the course of the quarter to smooth variability over the quarter.
 - Critical care beds represent ICU, HAU plus other critical care (CCU, CSICU).
 - Acute care beds represent medical/surgical beds and other acute care beds.

- Exclusions: newborn and pediatric intensive care cases; PHSA hospitalized cases to be reported separately.
- All bed estimates are rounded up (e.g., if 1.25 beds are required, rounded to 2 beds).
- Increase in elective surgical capacity:
 - The increase in surgical bed requirements related to supporting the 30% increase in elective surgical capacity is proportional to the historical elective surgical cases performed and commences in October.
- Planning for suspected COVID-19 cases:
 - Suspected COVID-19 cases require isolation until lab test data is available; clinical lab test data currently has a turnaround time of less than one day and has decreased significantly (from three days), with expanded lab capacity since the beginning of the COVID-19 pandemic.
 - COVID-19 case level data was reviewed by day of the pandemic and the average ratio of suspected: positive COVID-19 cases during the peak was estimated (April 1-16).
 - All bed estimates are rounded up (e.g., if 1.25 beds are required, rounded to 2 beds).

The modelling starts with historical admissions data to inform the fall/winter 2020/21 plan:

Pre-COVID-19 Average Hospital Census¹

Unit	Case Type	IHA	FHA	VCHA	VIHA	NHA	BC	Base Beds	%
ICU/HAU									
	Medical All	42.9	85.0	45.5	32.0	16.7	222.1		
	Surgical Elective	3.7	22.0	6.4	2.0	0.7	34.8		
	Surgical Urgent	15.6	37.1	36.1	11.7	2.7	103.2		
Total ICU/HAU		62.2	144.1	88.0	45.7	20.1	360.1	430	84%
Critical Care Other²									
	Medical All	2.5	15.3	7.7	1.3	0.0	26.8		
	Surgical Elective	1.8	7.0	8.3	3.6	0.0	20.7		
	Surgical Urgent	3.1	18.6	16.2	6.2	0.0	44.1		
Total Critical Care Other		7.4	40.9	32.2	11.1	0.0	91.6	125	73%
Critical Care All									
	Medical All	45.3	100.2	53.2	33.2	16.7	248.6		
	Surgical Elective	5.4	29.1	14.7	5.6	0.7	55.5		
	Surgical Urgent	18.8	55.7	52.4	17.9	2.7	147.5		
Total Critical Care		69.5	185.0	120.3	56.7	20.1	451.6	555	81%
Acute Care³									
	Medical All	1,092.7	2,040.5	1,234.8	1,383.5	416.6	6,168.1		
	Surgical Elective	128.8	184.5	213.8	135.9	39.1	702.1		
	Surgical Urgent	271.4	394.3	410.5	380.3	64.9	1,521.4		
Acute Care		1,492.9	2,619.3	1,859.1	1,899.7	520.6	8,391.6	8,031	104%
Total Census		1,562.4	2,804.3	1,979.4	1,956.4	540.7	8,843.2		

¹ Based on DAD date for Jan-Mar 2019

² Includes CSICU and CCU. PICU, NICU and newborn cases reported separately

³ Includes medical, surgical and other, non-critical care, units

This component of the modelling shows some overall surplus capacity in critical care but no surplus capacity in inpatient medical/surgical bed capacity based on historical modelling. However, as of August 2020, there continues to be significant capacity based on unoccupied beds across B.C., with critical care beds at approximately 60% occupancy (an occupancy range of 32% to 75% across health authorities) and overall acute hospital occupancy rates at 75% (a range of 60% to 95% across health authorities) against pre-COVID-19 December 2019 rates. These numbers will remain a key metric to continue monitoring through the fall and winter.

The historical admission data must be supplemented by adding increased surgical capacity to elective surgery bed requirements (assuming historical surgical distribution across sites) with increased volume based on the surgical renewal plan (assessed at a conservatively high 30%). For inpatient surgical bed use, this is forecasted to require an additional 211 beds overall. As it applies to ICU and critical care more broadly, this proportionally results in only a five-bed increase in expected ICU use and a 12-bed increase for other critical care beds.

Additional Demand for Surgical Strategy Surge

Service	IHA 130%	FHA 130%	VCHA 130%	VIHA 130%	NHA 130%	BC 130%	Daily Census Increase	
							N of Beds	% Beds
Oct-Dec 2020								
ICU	4.8	4.7	9.2	2.0	1.2	21.8	5.0	1.8%
Critical Care Other	2.1	32.2	10.8	5.5	0.0	50.6	11.7	6.8%
Critical Care Total	6.9	36.9	20.0	7.4	1.2	72.4	16.7	3.7%
Acute Care	152.0	231.3	270.8	185.1	52.5	891.7	205.8	2.5%
Jan-Mar 2021								
ICU	4.4	4.7	7.9	1.7	0.9	19.6	4.5	1.6%
Critical Care Other	2.6	33.2	11.2	5.6	0.0	52.5	12.1	7.0%
Critical Care Total	7.0	37.8	19.1	7.3	0.9	72.2	16.7	3.7%
Acute Care	167.4	239.9	277.9	176.7	50.8	912.7	210.6	2.5%

The final step is to add to potential COVID-19 in patient bed requirements using the four scenarios set out earlier:

1. **Low COVID-19 cases:** This mirrors the June situation, with low numbers of daily new cases and admission. It represents a minimal number of COVID-19 beds required among a limited number of sites – ICU 25/Acute 57 occupancy.
2. **Moderate COVID-19 cases:** Increasing transmission, resulting in a moderate number of COVID-19 cases and admissions – ICU 55/Acute 98 occupancy.
3. **High COVID-19 cases:** The number of COVID-19 new cases and admissions mirrors the March-May pandemic high point levels – ICU 108/Acute 201 occupancy.
4. **High++ COVID-19 cases:** The number of COVID-19 new cases and admissions mirrors an extreme scenario, with twice as many cases as during the March-May pandemic experience as is being used a stress test scenario for contingency planning purposes only – ICU 214/Acute 400 occupancy.

COVID-19 Cases Plus Suspected Cases Bed Requirements Against Four Scenarios

Need for Isolation Beds Linked to the Four Scenarios

Scenario 1: Low COVID-19 Cases						
	COVID-19 Positive Patients		Suspected Patients		Total Isolation Beds	
	ICU	Acute	ICU	Acute	ICU	Acute
HA						
IHA	3	6	1	3	4	9
FHA	6	12	2	6	8	18
VCHA	5	11	1	6	6	17
VIHA	3	5	1	3	4	8
NHA	2	3	1	2	3	5
BC	19	37	6	20	25	57

Scenario 2: Moderate COVID-19 Cases						
	COVID-19 Positive Patients		Suspected Patients		Total Isolation Beds	
	ICU	Acute	ICU	Acute	ICU	Acute
HA						
IHA	7	10	3	5	10	15
FHA	14	22	4	11	18	33
VCHA	12	18	3	9	15	27
VIHA	6	10	2	5	8	15
NHA	3	5	1	3	4	8
BC	42	65	13	33	55	98

Scenario 3: High COVID-19 Cases						
	COVID-19 Positive		COVID-19 Suspected		Total Isolation Beds	
	ICU	Acute	ICU	Acute	ICU	Acute
HA						
IHA	13	20	4	10	17	30
FHA	30	50	8	25	38	75
VCHA	21	35	6	18	27	53
VIHA	14	21	4	11	18	32
NHA	6	7	2	4	8	11
BC	84	133	24	68	108	201

Scenario 4: High+ COVID-19 Cases						
	COVID-19 Positive		COVID-19 Suspected		Total Isolation Beds	
	ICU	Acute	ICU	Acute	ICU	Acute
HA						
IHA	26	40	8	20	34	60
FHA	60	100	15	51	75	151
VCHA	42	70	12	35	54	105
VIHA	28	42	8	21	36	63
NHA	12	14	3	7	15	21
BC	168	266	46	134	214	400

The final step in the modelling process is to apply potential demand (normal historical, plus increased surgical, plus the four COVID-19 scenarios) against capacity/supply:

Scenario 1 – Low COVID-19

(normal historical, increased surgical, low COVID-19 demand)

Scenario: Low COVID-19 Cases						
HA	Unit	COVID-19 Sites				
		Scenario Demand	Base Beds	Surge Beds	Surplus/ Deficit Base Beds	Surplus/ Deficit Base+Surge Beds
IHA	ICU/HAU	62	64	24	2	26
	Other Critical Care	8	14	0	6	6
	Acute	1,309	1,114	228	-195	33
FHA	ICU/HAU	122	117	69	-5	64
	Other Critical Care	43	57	7	14	21
	Acute	1,305	1,206	437	-99	338
VCHA	ICU/HAU	89	82	21	-7	14
	Other Critical Care	35	38	89	3	92
	Acute	1,763	1,552	774	-211	563
VIHA	ICU/HAU	30	30	89	0	89
	Other Critical Care	13	16	0	3	3
	Acute	1,243	1,111	75	-132	-57
NHA	ICU/HAU	17	25	19	8	27
	Other Critical Care	0	0	0	0	0
	Acute	330	310	147	-20	127
BC	ICU/HAU	320	318	222	-2	220
	Other Critical Care	99	125	96	26	122
	Acute	5,950	5,293	1,661	-657	1,004

* Surge capacity includes existing unfunded beds; and excludes repurposed beds.

- This table demonstrates beds required for the low COVID-19 scenario within COVID-19 sites (only) in the context of typical census and increased surgery.
- No Health Authority can entirely meet demand through base beds only.
- By adding the additional surge capacity there is sufficient capacity to manage elective surgical requirements and COVID-19 cases with the exception of:
 - VIHA – Acute beds: deficit of 57 beds; VIHA would require shifting volumes to other hospital sites, utilizing surge beds and reducing medical inpatient admissions to eliminate this deficit.

Scenario 2 – Moderate COVID-19
(normal historical, increased surgical, low COVID-19 demand)

Scenario: Moderate COVID-19 Cases						
HA	Unit	COVID-19 Sites				
		Scenario Demand	Base Beds	Surge Beds	Surplus/ Deficit Base Beds	Surplus/ Deficit Base + Surge Beds
IHA	ICU/HAU	66	64	24	-2	22
	Other Critical Care	8	14	0	6	6
	Acute	1,313	1,114	228	-199	29
FHA	ICU/HAU	130	117	69	-13	56
	Other Critical Care	43	57	7	14	21
	Acute	1,315	1,206	437	-109	328
VCHA	ICU/HAU	96	82	21	-14	7
	Other Critical Care	35	38	89	3	92
	Acute	1,770	1,552	774	-218	556
VIHA	ICU/HAU	33	30	89	-3	86
	Other Critical Care	13	16	0	3	3
	Acute	1,248	1,111	75	-137	-62
NHA	ICU/HAU	18	25	19	7	26
	Other Critical Care	0	0	0	0	0
	Acute	332	310	147	-22	125
BC	ICU/HAU	343	318	222	-25	197
	Other Critical Care	99	125	96	26	122
	Acute	5,978	5,293	1,661	-685	976

* Surge capacity includes existing unfunded beds; and excludes repurposed beds.

- This table demonstrates bed demand for the moderate COVID-19 scenario and a response using COVID-19 sites (only).
- All Health Authorities have a deficit based on base beds alone.
- After addition of surge beds, the following deficits in the COVID-19 sites require mitigation (when COVID-19 sites only are used as per this analysis):
 - VIHA – Acute beds: deficit of 62 beds; VIHA would require shifting volumes to other hospital sites and enlisting strategies to reduce medical admissions to eliminate this deficit.
 - For IHA, VIHA and NHA the geography should be taken into account in planning for reasonable mitigations.

Scenario3 – High COVID-19 Cases

(normal historical, increased surgical, low COVID-19 demand)

Scenario: High COVID-19 Cases											
		COVID-19 Sites					Other Hospital Sites			COVID-19 and Other Hospital Sites	
HA	Unit	Scenario Demand	Base Beds	Surge Beds	Surplus/Deficit Base Beds	Surplus/Deficit Base + Surge Beds	Scenario Demand	Base Beds	Surge Beds	Surplus/Deficit Base Beds	Surplus/Deficit Base + Surge Beds
IHA	ICU/HAU	72	64	24	-8	16	6	6	0	-8	16
	Other Critical Care	8	14	0	6	6	0	0	0	6	6
	Acute	1,323	1,114	228	-209	19	230	235	71	-204	95
FHA	ICU/HAU	146	117	69	-29	40	36	35	7	-30	46
	Other Critical Care	43	57	7	14	21	0	0	0	14	21
	Acute	1,343	1,206	437	-137	300	1,382	1,305	520	-214	743
VCHA	ICU/HAU	105	82	21	-23	-2	7	18	46	-12	55
	Other Critical Care	35	38	89	3	92	0	0	0	3	92
	Acute	1,787	1,552	774	-235	539	172	410	8	3	785
VIHA	ICU/HAU	41	30	89	-11	78	21	22	34	-10	113
	Other Critical Care	13	16	0	3	3	0	0	0	3	3
	Acute	1,259	1,111	75	-148	-73	703	580	119	-271	-77
NHA	ICU/HAU	21	25	19	4	23	6	9	0	7	26
	Other Critical Care	0	0	0	0	0	0	0	0	0	0
	Acute	334	310	147	-24	123	207	218	114	-13	248
BC	ICU/HAU	385	318	222	-67	155	76	90	87	-53	256
	Other Critical Care	99	125	96	26	122	0	0	0	26	122
	Acute	6,046	5,293	1,661	-753	908	2,694	2,748	832	-699	1,794

* Surge capacity includes existing unfunded beds; and excludes repurposed beds.

• This table demonstrates beds required for the high COVID-19 scenario within COVID-19 and other hospital sites.

• Through the use of COVID-19 and other hospital sites, all Health Authorities must use surge beds. In addition, after using base and surge beds the following are noted:

- VIHA – Acute (deficit of 77 beds) continues to demonstrate a challenge even with the inclusion of primary and other hospital sites.

Ventilator Demand in High Scenario

Health Authority	Demand Scenario: High COVID-19 Cases				Demand vs. Supply		
	COVID-19 Sites		Other Hospital Sites		Total Demand ¹	Adult ICU Mechanical Ventilators	Mechanical Ventilators Demand vs. Supply
	ICU/HAU	Other Critical Care	ICU/HAU	Other Critical Care			
IHA	72	8	6	0	69	87	18
FHA	146	43	36	0	180	187	7
VCHA	105	35	7	0	118	185	67
VIHA	41	13	21	0	60	109	49
NHA	21	0	6	0	22	38	16
BC	385	99	76	0	448	606	158

¹ Assumes that 80% of all critical care patients will require mechanical ventilator

In all three scenarios, depending on the distribution of the COVID-19 cases, the number of base beds may be inadequate. To avoid a repeat of the spring experience of emptying hospital beds through surgical cancellations, health authorities will plan and prepare to open surge bed capacity, including staffing plans to operate the beds. With surge bed capacity, there should be adequate bed supply without emptying hospitals as was done in the spring phase of the pandemic.

In looking at these scenarios, it is important to keep in mind that the numbers are estimates and do not consider the additional mitigating strategies set out later and their impact on reducing inpatient bed occupancy. In addition, a practical level all three scenarios involve significant health human resource planning for the deployment of available of staff and their capacity at a site-specific level. Health authorities have been focused on hiring additional capacity over the summer, but regional and local circumstances will impact the ability to adequately staff and require local targeted management strategies contingent on local demand.

Scenario 4 – High++ COVID-19 Cases

(normal historical, increased surgical, low COVID-19 demand)

The fourth scenario is used as a theoretical stress test for the system:

Scenario: High+ COVID-19 Cases											
		COVID-19 Sites					Other Hospital Sites			COVID-19 and Other Hospital Sites	
HA	Unit	Scenario Demand	Base Beds	Surge Beds	Surplus/Deficit Base Beds	Surplus/Deficit Base + Surge Beds	Scenario Demand	Base Beds	Surge Beds	Surplus/Deficit Base Beds	Surplus/Deficit Base + Surge Beds
IHA	ICU/HAU	85	64	24	-21	3	6	6	0	-21	3
	Other Critical Care	8	14	0	6	6	0	0	0	6	6
	Acute	1,343	1,114	228	-229	-1	230	235	71	-224	75
FHA	ICU/HAU	176	117	69	-59	10	36	35	7	-60	16
	Other Critical Care	43	57	7	14	21	0	0	0	14	21
	Acute	1,393	1,206	437	-187	250	1,382	1,305	520	-264	693
VCHA	ICU/HAU	126	82	21	-44	-23	7	18	46	-33	34
	Other Critical Care	35	38	89	3	92	0	0	0	3	92
	Acute	1,822	1,552	774	-270	504	172	410	8	-32	750
VIHA	ICU/HAU	55	30	89	-25	64	21	22	34	-24	99
	Other Critical Care	13	16	0	3	3	0	0	0	3	3
	Acute	1,280	1,111	75	-169	-94	703	580	119	-292	-98
NHA	ICU/HAU	27	25	19	-2	17	6	9	0	1	20
	Other Critical Care	0	0	0	0	0	0	0	0	0	0
	Acute	341	310	147	-31	116	207	218	114	-20	241
BC	ICU/HAU	469	318	222	-151	71	76	90	87	-137	172
	Other Critical Care	99	125	96	26	122	0	0	0	26	122
	Acute	6,179	5,293	1,661	-886	775	2,694	2,748	832	-832	1,661

* Surge capacity includes existing unfunded beds; and excludes repurposed beds.

- This table demonstrates beds required for the high+ COVID-19 scenario within COVID-19 and other hospital sites.
- All Health Authorities must utilize surge beds. In addition, after using base and surge beds the following are noted:
 - IHA – Acute (deficit of 1 bed) mitigated by inclusion of other sites; limited flexibility in utilization of critical care capacity due to geography.
 - VCHA – ICU/HAU (deficit of 23 beds) mitigated by inclusion of “other” critical care beds and other hospital sites.
 - VIHA – Acute (deficit of 98 beds) continues to demonstrate a challenge even with the inclusion of COVID-19 and other hospital sites.

With respect to ventilator demand, assuming 80% of all critical care patients will require a mechanical ventilator, even against the high++ demand scenario there is adequate adult mechanical ventilator capacity. Again, planning for health human resource and capacity at a site-specific level is essential.

Ventilator Demand in High++ Scenario

Health Authority	Demand Scenario: High+ COVID-19 Cases				Demand vs. Supply		
	COVID-19 Sites		Other Hospital Sites		Total Demand ¹	Adult ICU Mechanical Ventilators	Mechanical Ventilators Demand vs. Supply
	ICU/HAU	Other Critical Care	ICU/HAU	Other Critical Care			
IHA	85	8	6	0	79	87	8
FHA	176	43	36	0	204	187	-17
VCHA	126	35	7	0	134	185	51
VIHA	55	13	21	0	71	109	38
NHA	27	0	6	0	26	38	12
BC	469	99	76	0	515	606	91

¹ Assumes that 80% of all critical care patients will require mechanical ventilator

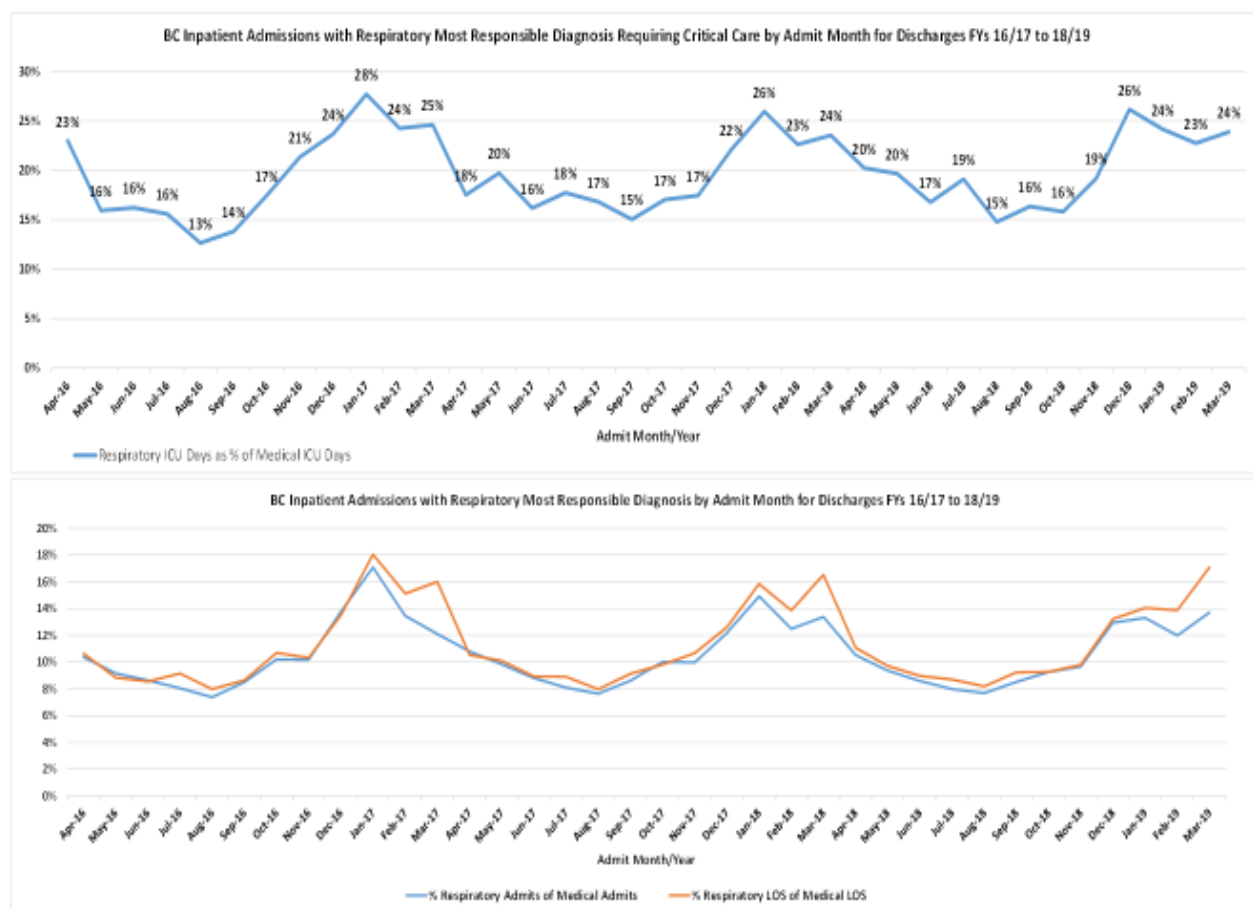
Overall, as would be expected from the spring 2020 experience of the COVID-19 pandemic, the B.C. health system has adequate physical capacity to meet demand with the backup of being able to successfully implement more extreme measures to reduce hospital occupancy, if required, as was done in March 2020. However, in contrast to the spring experience of a system-wide reduction in hospital services, there will be a staged approach to regionally respond to and manage demand based on daily monitoring of occupancy and trends. This staged approach will focus on using assigned COVID-19 bed capacity in the 19 primary sites and using some capacity as needed for local cases across the remaining hospital sites. It also involves planning and preparing for the deployment of health professionals to operationalize surge capacity in advance, and regional contingency management planning due to staffing shortages in some regions and due to the additional low threshold for staying away from work due to sickness.

These management strategies will together present significant operational challenges and underscore the message earlier in this paper on the imperative of an ongoing focus on sustaining the hierarchy of infection prevention and control measures (physical distancing, personal health hygiene practices, engineering controls and use of masks) across the community. They also underscore the need to further mitigate demand on the hospital system, which is the focus of the next section and the series of actions set out in the final section.

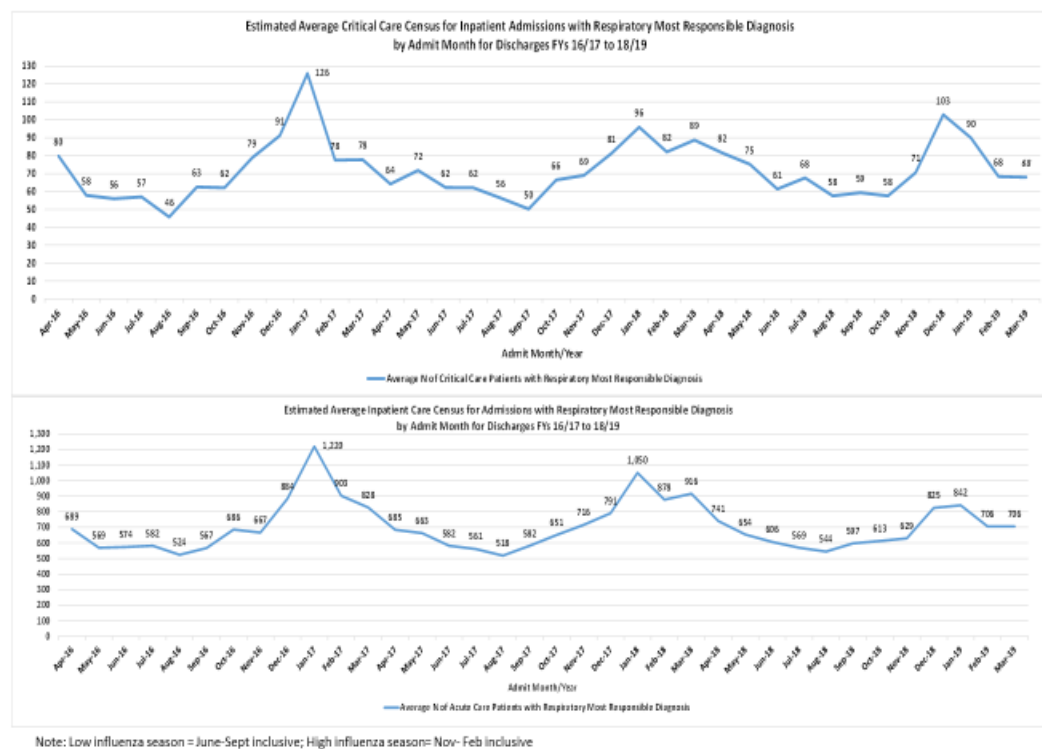
Mitigating Demand on Inpatient Medical Beds Fall/Winter 2020/21

A key driver of historical demand on inpatient bed use during the late fall and winter months is the influenza season. Reducing influenza transmission will have a direct impact on inpatient medical bed use. There are several factors that indicate this is possible. Firstly, the physical distancing measures in place and specifically the stronger emphasis on staying away from work when sick that are related to reducing the transmission of COVID-19 should also have a dampening effect on the transmission of influenza. Secondly, given the awareness of COVID-19 in the general population, and specifically in the higher risk older population, the demand and level of influenza vaccinations should be higher both in the community, and in long-term care and assisted living residences.

The Influence of Influenza Season on Inpatient Medical Bed Admissions



The Impact of Respiratory Admissions on Bed Census



Estimated number of beds occupied by patients with respiratory diagnosis:

- Critical care @ low influenza season: ~55
- Critical care @ high influenza season: ~85
- Acute care @ low influenza season: ~570
- Acute care @ high influenza season: ~840

Together, both factors should mitigate inpatient medical bed usage. Increased COVID-19 self-care, monitoring and support for higher risk populations – the elderly, older individuals with more severe underlying chronic conditions (cardiac, diabetes, respiratory) should further mitigate demand on inpatient medical bed usage.

The overall inpatient medical bed capacity will potentially be increased by a number of proposed measures and actions set out in the next section, including: introduction of a number of hospital-at-home teams attached to the hospitals identified as primary COVID-19 sites where feasible, based on proximity prioritize non-COVID-19 patient medical admissions to non-COVID-19 hospitals; proactive identification of higher risk frail patients in the community for enhanced care and proactive admission to long-term care; and proactive inpatient bed management for alternative levels of care patients.

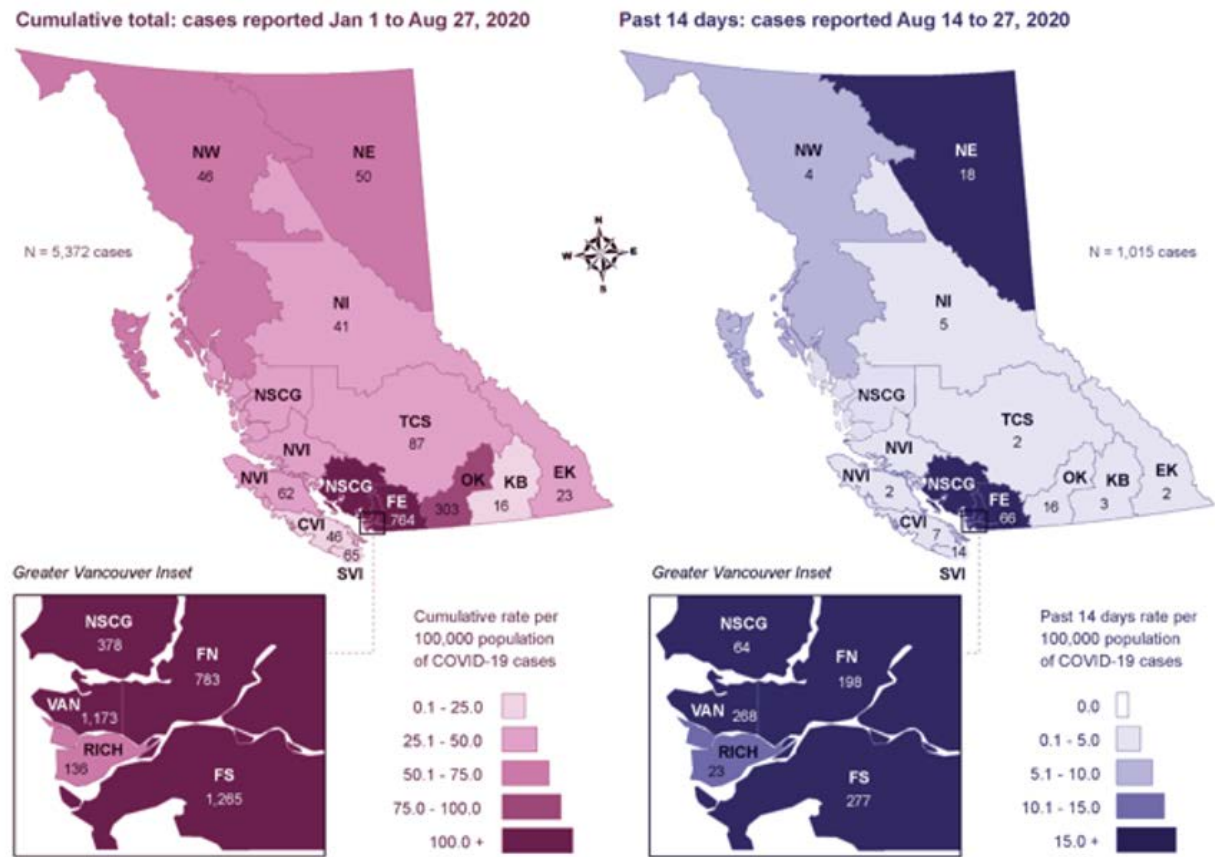
Managing COVID-19 Fall/Winter 2020/21

The spring 2020 experience of managing COVID-19, as well as increased capacity with respect to case finding, monitoring and hospital use data, provide a solid foundation for managing the pandemic through the fall and winter while meeting the balance of health care needs of B.C. patients. The ongoing focus on sustaining the hierarchy of infection prevention and control measures (physical distancing, personal health hygiene practices, engineering controls and use of masks) across the community is critical to ensuring the capacity of the health system to meet all patient needs over the fall/winter and sustain the business and social context.

This overall health system capacity will be strengthened by the planned additional measures to reduce normal historical demand on inpatient medical bed use throughout the fall/winter of 2020/21.

Overall, and in line with the spring 2020 experience of the COVID-19 pandemic, the B.C. health system has adequate physical capacity to meet demand with the back stop of knowing that we can successfully implement more extreme hospital management measures if required in the context of health human resource capacity. Learning from the spring experience, there will be a staged approach to regionally managing any significant surges in demand in contrast to the system-wide reduction in hospital bed occupancy used in March 2020.

Table 18: Geographic Distribution of COVID-19 Cases by Health Service Delivery Area



With this modelling as a foundation, there are a series of actions and supportive budget investments that are underway to further strengthen the resilience of the B.C. health system in preparation for the fall and winter across both public health and the broader health services continuum.

Health Services Key Actions

PUBLIC HEALTH STATUS AND ACTION

Actions

1. Focus on maximizing individual and population engagement in maintaining essential control measures: appropriate physical distancing; wearing face coverings in settings where physical distancing is not possible; regular hand and respiratory hygiene; and seeking out testing, collaborating with contact tracing, and self-isolating when needed. Provide ongoing public communication and reporting on the COVID-19 pandemic by the provincial health officer and Minister of Health supported by ongoing updates, analysis and advice provided publicly and on the BC Centre for Disease Control (BCCDC) website. Technical briefings provided by the provincial health officer and the deputy minister on overall data, developments and evolving evidence on COVID-19 as required. (ongoing)
2. Public health will provide enhanced guidance as needed for commercial, public and domestic settings to reduce virus transmissions indoors as the fall and winter season approaches. (starting mid-September and ongoing through fall/winter)
3. The Office of the Provincial Health Officer, the BCCDC and regional health authorities will implement expanded testing, contact tracing and case management capacity to cope with increasing demands over the fall and winter to ensure it can respond quickly and accurately to increased virus transmission. The ministry's Health Sector Workforce and Beneficiary Services Division, with support from Recruitment Solutions (that is Health Match BC), will ensure that regional health authority surveillance (identification), case management (containment) and contact tracing (suppression) capacity is strengthened by recruiting up to an additional 500 temporary staff for the fall and winter. The ministry's Digital IMIT Division will implement available technological tools to permit timely, integrated and co-ordinated information capture for a case and contact management database to enable a rapid public health response when required, along with enhanced reporting and analysis capacity. The ministry's Digital IMIT Division will work with the provincial health officer and the BCCDC to assess and implement (if viable) digital contact tracing as an enhancement to traditional contact. (October through April)
4. The provincial health officer, the BCCDC and regional health authorities will promote and enable the maximum uptake of influenza vaccination by the general public, with a strong focus on the older population, health and social care workers through an enhanced fall flu immunization campaign. (late September through November)
5. The provincial health officer and the BCCDC will closely monitor and report out on the development of potential vaccines and treatment regimes working with Health Canada, the Public Health Agency Canada and other jurisdictions (ongoing). The provincial health officer and the BCCDC will provide recommendations on a patient prioritization policy for immunization and

plan capacity and supplies with regional health authorities for large scale immunization across the province contingent on a vaccine. (ongoing)

6. Build out BCCDC capacity through additional core funding to allow the BCCDC to provide increased ongoing support to the provincial health officer and deputy minister, including analysis and monitoring of the COVID-19 pandemic. (September/October)

PRIMARY CARE AND MEDICAL SPECIALIST CARE

Actions

1. The ministry's Primary Care Division and the PHSA Provincial Clinical Policy team will work with urgent and primary care centres and the General Practitioners Service Committee to establish consistent community patient care guidelines and practices for COVID-19 patients, including rapid referral pathways to higher levels of care (including specialized community services programs) as required. (completed end of September 2020)
2. The ministry's Primary Care Division, supported by PHSA's Provincial Clinical Policy team and clinical reference groups, will work on a Healthy@Home care project with regional health authority Ambulatory Care programs, community medical specialists, and general practitioners to establish operational and patient care clinical guidelines and criteria, including virtual care. These will focus on the health and safety of older patients and/or individuals more likely to experience a serious form of the illness due to underlying chronic medical conditions. (completed end of September 2020)

Key populations:

- a. Cardiac patients
 - b. Diabetic patients
 - c. Respiratory patients
 - d. Moderate to complex co-morbid medical patients
 - e. Oncology patients
 - f. Renal patients
 - g. Transplant patients
3. The ministry's Primary Care Division will continue to work with regional health authorities and primary care networks to operationalize urgent and primary care centres (UPCCs) to reduce pressure on emergency departments over the fall and winter. As part of the COVID-19 response, planning will be completed to position the UPCCs and specific primary care clinics as "acute respiratory care centres" for the coming fall/winter flu/COVID-19 season if required by a moderate to high transmission rate to meet testing and short-term care needs. (completed September 2020)

4. The ministry's Primary Care Division will continue the implementation of primary care networks and team-based care (patient medical homes and First Nation Health Authority primary care initiatives), including enhanced access to virtual care. Operational criteria for the use of virtual care will be refreshed and ready for implementation. (completed end of September 2020)
5. The ministry's Primary Care Division will work with divisions of family practice and current primary care networks to re-canvas general practitioner and nurse practitioner availability to potentially:
 - a. Provide shift coverages for hospitalists (who may be redeployed to critical care and respiratory/COVID-19 care) if there is a significant re-surge of COVID-19 admissions to a hospital using short-term alternative payment contracts to support non-fee-for-service work.
 - b. Provide care for long-term care sites if needed.
 - c. Provide primary care for patients with COVID-19 through designated urgent and primary care centres and clinics (respiratory care centres).

COMMUNITY CARE SERVICES

Actions

1. Home and Community Care Services
 - a. The ministry's Health Services Division will review IPC standards developed for the spring phase of the pandemic and will: clearly set out any revisions to strengthen standards and guidelines; co-ordinate health authority and community agency implementation and recruitment of additional capacity if needed; and ensure and monitor provincial processes for follow-up and review after any outbreaks. (implementation end of September 2020 onwards)
 - b. The ministry's Health Services Division will explore and recommend options for individuals to remain at home with supports over the coming year as an alternative or to defer admission to long-term care/assisted living during the COVID-19 pandemic. Learnings from local initiatives (e.g., Vancouver Coastal Health's Personalized Stabilization and Support Program) will be used to better support individuals aging at home as an alternate to long-term care. (end of September 2020)
2. Long-Term Care and Alternative Living Sites
 - a. The ministry's Health Services Division will continue to review and develop options for visitor policy and practices that optimize safety of residents balanced with harm caused by ongoing separation from family and friends (ongoing).
 - b. Fluzone-HD immunizations will be made available, co-ordinated through the BC Centre for Disease Control, to all long-term care residents (fall 2020).
 - c. The ministry's Health Services Division will review and update/amend policies that guide the admission, transfer and absences from long-term care/assisted living, and establish risk-based criteria to guide when policy restrictions will be implemented. (end of September 2020)

- d. The ministry's Health Services and COVID-19 Response and Health Emergency Management divisions will: establish requirements for monitoring and reporting on infection prevention and control practice across all long-term care/assisted living sites; and ensure and monitor provincial processes for routine review and follow-up after an outbreak. (implementation end of September 2020 onwards)
- e. The Ministry of Health (Health Services and Health Sector Workforce and Beneficiaries divisions) will work with health authorities and service agencies to implement the single-site working directive. They will further support the permanency of this model by working with the ministry's Finance and Corporate Services Division to implement a new provincial template contract structure to create equitable wage rates and funding, and clear requirements for quality, including safety. (in effect April 1, 2021)

Specific to the recruitment of staff for long-term care:

- i. The Ministry of Health (Health Services and Health Sector Workforce and Beneficiary Services divisions) assisted by Recruitment Solutions (HEABC) will lead a provincial recruitment plan that actively targets displaced workforces in B.C. from the hospitality, food services, retail and tourism sectors to be employed and trained within the long-term care sector. This will be in both direct patient care (care aides) and in-direct patient care (food services, cleaning, security etc.).
 - ii. The ministry's Health Sector Workforce and Beneficiary Services Division will continue to implement and market the alternate registration pathway for qualified, out-of-province health care aides. This approach enables health authorities and affiliates to efficiently hire qualified health care aides to meet staffing needs, while ensuring standard orientation program requirements are in place and delivered by employers.
 - iii. The ministry's Health Sector Workforce and Beneficiary Services Division will work closely with employers and the Facility Bargaining Association Recruitment and Retention Committee on other action-oriented strategies to recruit and retain care aides in the province.
3. The Ministry of Health (Primary Care and Health Services divisions) will work with the ministries of Social Development & Poverty Reduction, Municipal Affairs and Housing, and Mental Health and Addictions to support the homelessness and poverty reduction strategies. Specifically, the provision of community care services to serve targeted groups of vulnerable populations being housed in provincial shelters and congregate housing during the COVID-19 pandemic.

PATIENT TRANSPORTATION (B.C. EMERGENCY HEALTH SERVICES/REGIONAL HEALTH SERVICES)

Actions

1. The ministry's Health Services Division will lead and co-ordinate the implementation of the Rural, Remote and Indigenous Community Framework in collaboration with BC Emergency Health Services, regional health authorities and the First Nations Health Authority to provide more in-community support and testing, timely access to primary and urgent hospital care (ongoing):
 - a. Address paramedic capacity linked to transportation and travel vent capacity/skills planning.
 - b. Improving medical transportation options.
 - c. Establishing short term housing and accommodation options for COVID-19 patients in rural and remote locations close to hospital care.
 - d. Support continued use of virtual doctor of the day programs.
 - e. Access to testing for rural areas.

LABORATORY TESTING CAPACITY

Actions

1. The ministry's Pharmaceutical and Laboratory Services Division, along with the Provincial Lab Agency, will increase COVID-19 NAT testing capacity to approximately 20,000 daily capacity, including testing for flu. (late October 2020)
2. The ministry's COVID-19 Response and Health Emergency Management Division will work with large scale industrial and/or business sectors if they develop evidence-based proposals to introduce testing linked to their businesses to both support and ensure alignment with provincial guidelines and practice.
3. The BCCDC, working closely with the Provincial Lab Agency will – as available – assess the true extent of COVID-19 infections at a population level by means of a systematic and representative serological survey of communities to determine susceptibility and immunity if such testing is validated. (TBD)

HOSPITAL CAPACITY & SERVICES

Actions

1. The Ministry of Health (Health Services and the COVID-19 Response and Health Emergency Management divisions) will: review and clearly set out any revisions to strengthen standards and practices for hospital infection prevention and controls; co-ordinate health authority implementation and communication strategies; and establish requirements for monitoring and reporting on consistent infection prevention and control practices across all hospital sites. (completed by end of September 2020, then ongoing)
2. All health authorities will develop practical plans to operationalize surge capacity across their hospitals, with fully developed health human resource preparation and deployment plans for the fall and winter (Health Services Division and the COVID Response health authority teams).
3. The ministry's Health Services Division will monitor and work with regional health authorities as they manage inpatient bed occupancy and bed capacity (including implementing surge bed capacity) to ensure ability to respond to COVID-19 surge aligned with modelling and analysis (ongoing):
 - a. Plan to implement COVID-19 hospital care structures and functions for implementation in the fall/winter contingent on COVID-19 transmission rates (ready for implementation end of September 2020):
 - i. Emergency department COVID-19 and routine pathways (respiratory/non respiratory).
 - ii. Visitor policies.
 - iii. Alternate level of care management practices.
 - iv. COVID-19 "cohorted" wards.
 - v. Critical care – intensive care units (ICU) and high acuity units (HAU).
4. The ministry's Health Services Division, working with the COVID-19 Response and Health Emergency Management Division, will support regional health authorities to continue to build out ICU, HAU and ventilator capacity:
 - a. Monitor capacity and equipment availability and needs. Working with the Critical Care Clinical Working Group and PHA Provincial Clinical Standards and Coordination team, continue to monitor and review as needed criteria for allocation and use of ventilators to care for COVID-19 patients.
 - b. Ensure a provincially co-ordinated approach to Biomedical support services through the Provincial Health Services Authority.
5. The ministry's Health Services Division will work with regional health authorities to operationalize and build out a "hospital@home" model (adopted from Australia) for implementation in fall/winter of 2020/21 across B.C. to reduce pressure on hospital inpatient medical beds and provide care closer to home in community settings.

The model involves identifying which sub-group of patients currently routinely cared for in a hospital setting might be cared for at home by a team of outreach hospitalists and nursing staff providing daily care and monitoring as part of a virtual community ward. Implementation will be considered across all identified primary and secondary COVID-19 hospital sites but with initial prototype sites confirmed and ready for implementation by the end of October 2020.

6. The ministry's Health Sector Workforce and Beneficiary Services Division will facilitate the development of plans and co-ordinated activities to support health authorities to continue to build and strengthen health human resource capacity:
 - a. Health authorities will focus on:
 - i. Proactively contacting all new nursing and allied health graduates and offering them employment and effective transition to practice supports and mentoring.
 - ii. Through the Health Employers Association of British Columbia (HEABC), increase the scope of Recruitment Solutions (Health Match BC) to actively market and recruit nurses and allied health within the province, nationally and internationally.
 - iii. With the support of HEABC and Recruitment Solutions, develop virtual training materials and employer onboarding information to standardize and expedite nurses being job ready.
 - b. Health authorities will work closely with the Ministry of Health as part of a provincially co-ordinated approach to prepare and redeploy staff in the fall/winter (September 2020). This will include:
 - i. Adequate respiratory/vent capable and critical care staff to meet projected demand for high level scenario.
 - ii. Assessment and plans to attend to age and underlying health status of health care and support workers (including discussions with staff who are pregnant) as to where they might best and most safely be deployed to avoid working as "cohorted" staff with COVID-19 patients.
 - iii. Orientation material and processes in place as needed to support assigned staff from community to hospital care.
 - iv. Canvas specialist availability (surgeons, anaesthetists, medical specialists from outpatient clinics) to provide shift coverages if there is a significant surge in inpatients. Use short-term alternative payment contracts as needed to support non-fee-for-service work.

SUPPORTIVE ORGANIZATIONAL INFRASTRUCTURE

HEALTH HUMAN RESOURCE SERVICES

(Ministry's Health Sector Workforce and Beneficiary Services Division)

Actions

1. Support, monitor and report on regional health authorities' recruitment, training and placement programs to address COVID-19 response needs. (ongoing)
2. Support, monitor and report on regional health authorities' training for infection prevention and control, and the appropriate and safe use of PPE. (ongoing)

DIGITAL, IMIT, AND TECHNOLOGY SUPPORT SERVICES

(Digital IMIT Division)

There is a need for an overall co-ordinated strategy to support the various initiatives identified in this plan such as virtual health, electronic support for contact tracing, home health monitoring and an integrated provincial surveillance database.

Actions

1. Co-ordinate cross-sector action for digital/IMIT and technology projects in support of COVID-19 management, and digital and IMIT products needed to support the COVID-19 response. (ongoing)
2. Support expanding capacity and reach of virtual care and home health monitoring services. (ongoing)

LOGISTICAL SUPPORT SERVICES

(COVID-19 Response and Health Emergency Management Division)

Actions

1. Monitor and work with the Provincial Health Services Shared Services Program to meet recommended personal protective inventory targets and other key supply needs. (ongoing)

BUDGET, COMMERCIAL AND SUPPORT SERVICES

(Finance and Corporate Services Division)

Actions

1. Establish a revised funding model for contracted long-term care and assisted living, and develop a refreshed and provincially consistent contract template for health authorities. Incorporate the work of the ministry's Health Services and Health Human Resource divisions as it relates to quality, accountability and health human resources. (fall 2020)
2. Refresh health system budget for Ministry of Health and health authorities based on the net new \$1.6 billion budget increase for 2020/21.

