

HEALTH SECTOR PLAN FOR FALL/WINTER 2020/21 MANAGEMENT OF COVID-19

Ministry of Health

September 2020

Planning For COVID-19 Fall/Winter 2020-21

Outline of Plan

- Plan sets out the specific actions the health system is taking to further strengthen our public health response to COVID-19 and actions to manage both normal routine demand for health services and the ongoing pandemic through the fall and winter of 2020/21
- The actions are based on an analysis of health system capacity and the demand the health system will face based on: a normal fall/winter season; additional demand for hospital care arising from the surgical restart plan; and potential four scenarios (low, medium, high, exceptional) for COVID-19 transmission and hospital requirements (inpatient, critical care, and ventilators) over the mid fall/winter of 2020/21
- The action plan is underpinned by access to an additional \$1.6BN in funding for 2020/21 – approximately \$850M has already been announced (including funding for increased contact tracing staff, the enhanced rural remote transportation framework, single site staffing initiative, the surgical restart strategy, and increased spending for personal protective equipment).

- A key action coming out of the first wave of the COVID-19 pandemic was the **safe restart** of those parts of the health system where services were temporarily reduced or stopped during the spring – the **surgical restart** being a key initiative. For the **fall/winter we want to maintain normal routine access to health care as much as possible while also responding effectively to managing COVID-19**
- The overall assessment, and in line with the spring 2020 experience of the COVID-19 epidemic, 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 measures linked to delayed surgeries or admissions if required**
- A key action for the fall is to have in place as much as possible additional **surge capacity across key hospitals** so that it will be less likely that changes to surgical planning and medical admissions would need to be considered. However, surge capacity **requires a continued focus on strengthening health human resources** – hiring, training, and effective deployment will be a key priority

- In addition, there will be a **staged approach to regionally managing surges in demand** in contrast to the system wide reduction in hospital bed occupancy used in March 2020 further protecting surgical planning and medical admissions
- This staged approach will start by using assigned COVID-19 bed capacity in **nineteen COVID-19 sites** with the remaining sites be used for what are expected to be a small number of local cases. This approach is further supported by work underway to ensure a **responsive patient transportation and support service in rural areas** of the province.

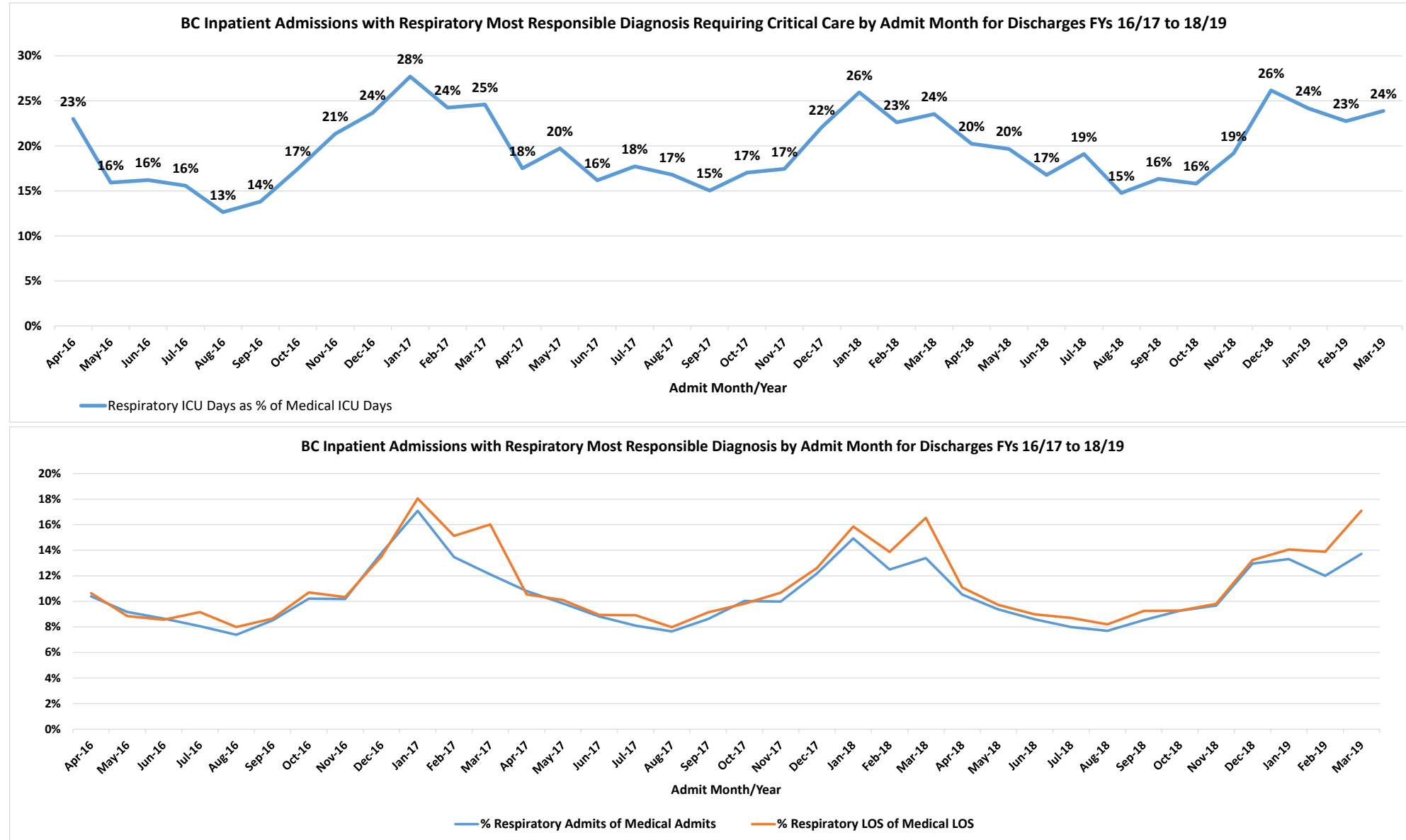
- The overall health system capacity will be further strengthened by a range of **additional measures to reduce normal historical demand on inpatient medical bed utilization** throughout the Fall/Winter of 2020/21 including:
 - the **ongoing need for sustaining the hierarchy of infection prevention and control measures across commercial, work, and social settings**. These are critical to reducing pressure on our health human resources and health system
 - A fall **influenza immunization** action plan
 - Sustained focus on **protecting vulnerable seniors** in Long Term Care and those individuals at greater risk in the community
 - Strengthened **in-patient bed management strategies** such as a new hospital at home initiative
- To effectively plan for and manage COVID-19 through the balance of 2020/21, Ministry of Health has established a **COVID Response and Health Emergency Management Division** and **six** newly established **Health Authority Pandemic Planning and Management Working Teams**

Core Actions to Manage COVID-19 Fall/Winter 2020/21

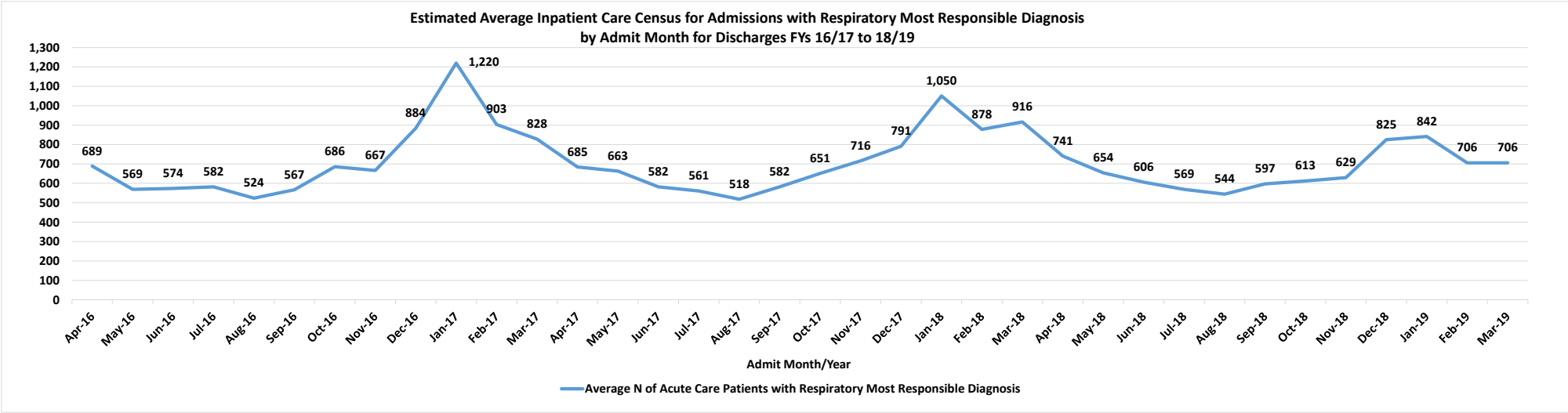
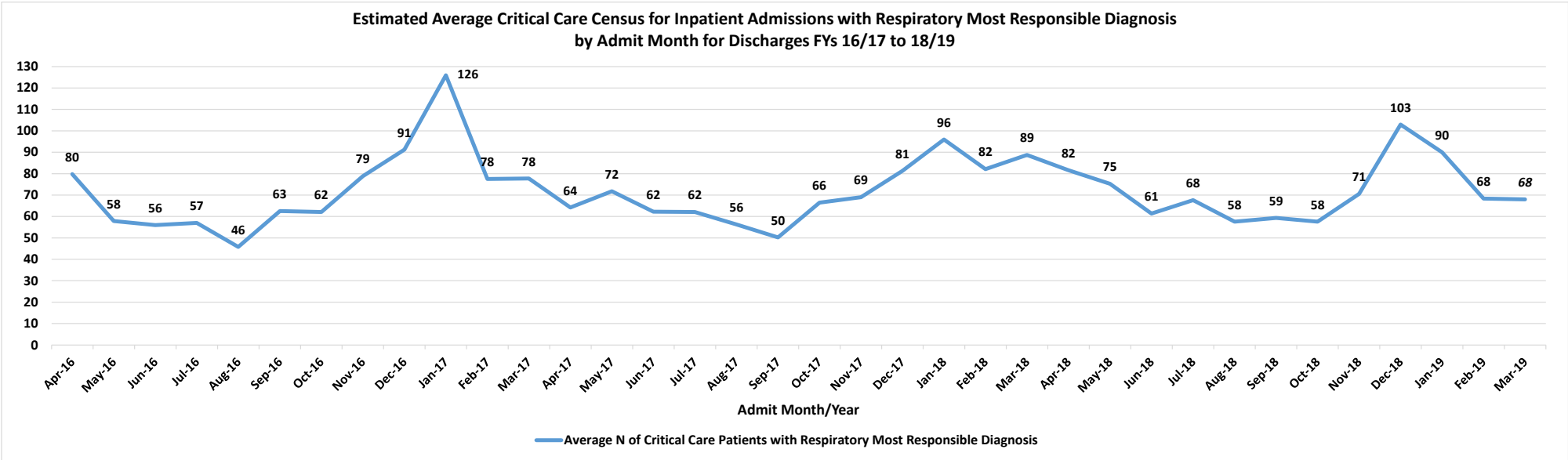
Strengthen Public Health

- Ongoing focus on sustaining the hierarchy of infection prevention and control measures across commercial, work, and social settings to minimize pressure on health system over the fall/winter
- Building out **testing capacity** for the fall/winter to approximately 20,000 tests per day for when there is a higher prevalence of flu and colds in the community with the need to quickly and accurately assess COVID-19 cases
- Increased **contact tracing and case management** capacity to effectively suppress transmission through the addition of more than 500 new staff
- An enhanced **fall flu immunization** campaign through the purchase of 1,965,000 doses of vaccine

The Influence of Influenza Season on Hospital Admissions



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

Note: Low influenza season = June-Sept inclusive; High influenza season= Nov- Feb inclusive

- Influenza is a key driver of historical demand on inpatient bed utilization during the late fall and winter months
- The influenza season should be impacted positively by:
 - The social distancing and control measures in place for COVID-19
 - The fall influenza immunization campaign

Protect Vulnerable Seniors

- Ensuring we have in place robust **infection prevention and control practices** across all assisted living (AL) and long terms care facilities (LTC) with funding to hire up to an additional 2000 staff.
- **Making Fluzone-High Dose immunizations available to all LTC and AL residents** as part of the fall immunization strategy with the provision of 45,000 doses of vaccine available.
- **Major recruitment and training strategy for additional health care aides, cleaning and food service staff across the long-term care sector – up to 5000 new staff to add additional capacity.**

Strengthen Care for Patients at Higher Risk through Primary and Medical Specialist Care

- Developing **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.
- Developing **patient care clinical guidelines and increasing use of virtual care** focused on health and safety of **older patients and/or individuals more likely to experience a serious form of the illness** due to underlying chronic medical (cardiac, diabetes, renal, respiratory, cancer, compromised immune system).
- Planning to position the Urgent and Primary Care Clinics and other designated primary care clinics as “**acute respiratory illness centres**” for the coming fall/winter flu/COVID-19 season as required.
- Providing **infection prevention and control practices** services to **vulnerable populations being housed in provincial shelters and congregate housing** during the COVID-19 pandemic.

Strengthen Patient Transport and Access to Care in Rural/Remote Areas

- Implementation of the Rural, Remote and Indigenous Community Framework to provide more **in-community support and testing, timely access to primary and urgent hospital care.**

Increased Assessment and Laboratory Testing Capacity

- Increase COVID-19 NAT **assessment and testing** capacity to **approximately 20,000** daily capacity, including testing for flu.

Strengthen Hospital Capacity and Services

- Robust hospital **infection prevention and control practices** across all hospital sites.
- Implement **hospital COVID-19 management** strategies:
 - Operationalize **surge capacity** for in early fall and will develop contingency plans for Scenario 4
 - Establish **Emergency Department** COVID-19 and Routine Pathways (respiratory/non respiratory)
 - Maintain visitor policies
 - Prepare COVID-19 “Cohorted” Wards and review to ensure isolation capacity
 - Maintain focus on **Critical Care and Ventilator Access management** (ICU/High Acuity Units).
 - Prototype “hospital at home” model and other **measures to reduce inpatient medical bed demand**
- Ongoing focus on **building and strengthening health human resource capacity** across hospitals.

Adequate Personal Protective Equipment

- Continue efforts to source and strengthen **reliable supply chain** and build out **on-hand** capacity for mid-fall/winter
- From March to early September the following PPE has arrived in BC:
 - 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
 - Almost 8,000,000 gowns

Analysis For Planning

The Inpatient Planning/Modelling Approach

- As was done in the spring of 2020, we start with understanding the current capacity (or “supply”) of the inpatient health care system.
- We calculate demand on inpatient care using:
 - Data from previous (pre-COVID-19) year
 - Normal seasonal variation including the effects of typical influenza season where there are more respiratory admissions
 - Additional inpatient surgical demand (due to surgical re-start/catch-up strategy)
 - Possible COVID-19 demand

Determining Capacity

Considerations In Determining Capacity

- Inpatient bed types:
 - Critical care beds
 - Intensive care unit (ICU)
 - High acuity unit (HAU)
 - Other (adult) critical care units (CSICU, CCU)
 - Inpatient (adult) medical/surgical beds
 - Other beds
 - Maternity, pediatrics, mental health, rehabilitation, palliative care
 - Pediatric intensive care, neonatal intensive care
- Total beds available = “base” and “surge” beds
 - 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
- 19 sites will again be designated as the primary COVID-19 sites

19 COVID-19 Sites: First Lines of Defense

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.

Critical Care Capacity – COVID-19 Sites' Detail

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

Adult Mechanical Ventilators Capacity Across BC

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

Acute Care Bed Capacity: August 2020

March 2020 Capacity		August 2020 Capacity							
Health Authority	Medical and Surgical ¹ - All Hospital Sites	Base Beds							
		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 as of March 2020 is also provided.

Acute Care Bed Capacity – COVID-19 Sites' Detail

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

Determining Demand

Start With Historical Admission Data to Inform the Fall/Winter 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	408	88%
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	533	85%
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	8,041	104%
Total Census		1,562.4	2,804.3	1,979.4	1,956.4	540.7	8,843.2		

- This data is a key source of evidence to determine potential admissions in the upcoming fall and winter.
- Of note, elective surgeries represent a relatively small percentage of bed capacity (with the exception of critical care other where it represents about 1/3 of capacity).
- Average census represents more than 100% of total base beds primarily because of acute care pressure.

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

Factor in an Increase in Scheduled Surgery from Surgical Restart Plan

- With aim to increase elective surgical bed requirements to reduce wait times for surgery have modeled an increase of 30% over and above historical demand for the upcoming period of Oct 2020 - Mar 2021.
- Historically, seasonality has minimal impact on elective surgeries.
- As denoted below, this increase in elective surgery represents approx. a 3% increase in ICU/HAU beds; 7% increase in “other” critical care beds and 3% increase in acute care beds.

	IHA	FHA	VCHA	VIHA	NHA	BC	Daily Census Increase	
	130%	130%	130%	130%	130%	130%	N of Beds	% Beds
Oct-Dec 2020								
ICU/HAU	4.9	28.9	10.4	3.1	1.2	48.5	11.2	3.1%
Critical Care Other	2.0	8.1	9.6	4.2	0.0	23.8	5.5	6.1%
Critical Care Total	6.9	36.9	20.0	7.4	1.2	72.4	16.7	3.7%
Acute	152.0	231.3	270.8	185.1	52.5	891.7	205.8	2.5%
Jan-Mar 2021								
ICU/HAU	4.8	28.6	8.3	2.6	0.9	45.2	10.4	2.9%
Critical Care Other	2.3	9.1	10.8	4.7	0.0	26.9	6.2	6.8%
Critical Care Total	7.0	37.8	19.1	7.3	0.9	72.2	16.7	3.7%
Acute	167.4	239.9	277.9	176.7	50.8	912.7	210.6	2.5%

Model Potential Additional Impact Of COVID-19

- We have data/evidence from our own BC experience from spring 2020 to assist our understanding of the relationship between social contact, the number of cases and hospitalization needs/beds required in critical care and non-critical acute care.
- Modeling of four potential fall/winter scenarios can be used to plan the impact on increased bed capacity:
 - **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) – **ICU 25/Acute 57 occupancy**
 - **Moderate COVID-19 cases** (increasing transmission, resulting in a moderate number of COVID-19 cases and admissions) - **ICU 55/Acute 98 occupancy**
 - **High COVID-19 cases** (the number of COVID-19 new cases and admissions mirrors the March-May epidemic high point levels - **ICU 108/Acute 201 occupancy**
 - **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 epidemic experience as is being used a “stress test” scenario for contingency planning purposes only) - **ICU 214/Acute 400 occupancy**

Need For Isolation Beds Across 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 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 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 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

- Both patients with confirmed and suspected COVID-19 require isolation beds.
- We can estimate the future isolation bed needs for COVID-19 related needs.
- Using our 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.
- Further clarification of isolation beds need with Health Authority partners is underway to ensure other reasons for isolation are considered.

Comparing Estimated Demand to Current Bed Supply

Total Demand with Comparison to Beds

Scenario 1: Low COVID-19 cases

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

- 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.

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

Total Demand with Comparison to Beds

Scenario 2: Moderate COVID-19 cases

Scenario: Moderate COVID-19 Cases						
		COVID-19 Sites				
HA	Unit	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.

Total Demand with Comparison to Beds

Scenario 3: High COVID-19 cases

Scenario: High COVID-19 Cases											
HA	Unit	COVID-19 Sites					Other Hospital Sites			COVID-19 and Other Hospital Sites	
		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

- 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.

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

Ventilator Demand vs. Supply: High COVID-19 Case Scenario

	Demand Scenario: High COVID-19 Cases				Demand vs. Supply		
Health Authority	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

Total Demand with Comparison to Beds

Scenario 4: High++ COVID-19 cases

Scenario: High+ COVID-19 Cases											
HA	Unit	COVID-19 Sites					Other Hospital Sites			COVID-19 and Other Hospital Sites	
		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.

Ventilator Demand vs. Supply: High+ COVID-19 Case Scenario

	Demand Scenario: High+ COVID-19 Cases				Demand vs. Supply		
Health Authority	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

Additional Budget Allocation 2020/21

Funding for Health Sector Management of COVID-19

- Ministry of Health has received an operating budget increase of \$1.58 billion and capital budget increase of \$150 million for 2020/21 to respond to healthcare requirements of COVID-19. Includes:
 - \$374.0 million for public health measures
 - \$416.6 million for community and long-term care measures
 - \$783.9 million for recovery and increased health capacity
- \$150 million for renovations and equipment to support the healthcare system to respond to COVID-19
- Approximately \$850M of this amount has already been announced for a number of initiatives (including increased contact tracing staff, the enhanced rural remote transportation framework, single site staffing initiative, the surgical restart strategy, and increased spending for personal protective equipment).

Funding Public Health

Description	Estimated Costs (\$M)	Comments
Immunization	\$30.0	\$18.8 million for flu and anti-viral vaccines and harm reduction supplies; \$10.8 million for additional public health staff, \$0.4 million for warehouse costs.
Contact Tracing	\$46.9	500 staff to support contact tracing across British Columbia.
Lab Testing	\$88.8	Strengthening lab testing across the province, including nucleic acid testing (\$76.9), serology testing (\$5.3), increased lab capacity (\$6.4) and support costs (\$.2)
BCCDC Capacity	\$18.3	Increase of up to 144 FTEs for BC Centre for Disease Control to strengthen capacity. Includes lease, overhead and support costs.
SFU Research Fellowship	\$15.0	Funding for three years for the creation of a Centre for Pandemic Studies led by Simon Fraser University and University of BC (\$5m/yr for 3 yrs).
BCCDC Foundation	\$10.0	Funding for critical research through BCCDC leveraging other donations.

Funding Public Health, continued

Description	Estimated Costs (\$M)	Comments
Rural, Remote and Indigenous Community Framework	\$58.5	New framework for health care in rural, remote and Indigenous communities to improve residents' access to critical and culturally appropriate health care, including an additional 55 ambulances and paramedic crews, and additional fixed wing aircraft and helicopters for patient transport.
Rural and Remote Virtual Care	\$33.1	Improved access to virtual healthcare, including Doctor of the Day to connect remote patients and their families to a doctor or nurse
Digital services	\$21.4	Additional hardware, software and staff to support virtual services across all Health Authorities
Staff Isolation	\$24.2	Self-isolation costs for staff across the province including accommodation, meals, travel and cost of replacement staff.
Public Health Capacity	\$27.8	Funding for additional public health staff for 6 HAs
Total	\$374.0	Funding for Public Health Measures

Funding Community and Long-Term Care

Description	Estimated Costs (\$M)	Comments
Infection Prevention and Control	\$1.7	\$3,750 for 450 locations across the province to provide training and supplies.
Incremental Costs	\$26.6	One-time block funding to address costs incurred by Long-Term Care and Assisted Living service providers such as deep cleaning, meal delivery, PPT, security, etc.
Single Site Wage Top Up	\$165.4	Healthcare staff and service provider costs related to the single site directive restricting staff to work in one facility to prevent the spread of COVID-19
Screening staff and visitors	\$122.4	Funding for an average of 3 new staff per site for long-term care and assisted living facilities across the province to support infection prevention and control (1,752 FTEs)
Additional staff	\$97.5	Funding for an average of 5 new staff to address operational capacity in the Long-Term Care and Assisted Living sector at 584 sites across the province (2,920 FTEs)
Virtual Care	\$3.0	Funding to strengthen virtual care services in Primary Care Networks and Team-based Care locations.
Total	\$416.6	Funding for Community and Long-Term Care

Funding Recovery and Increased Health Capacity

Description	Estimated Costs (\$M)	Comments
Surgical Strategy	\$187.5	Enhanced surgical capacity include additional nursing staff and OR costs.
Hospital at Home	\$42.32	Staffing and support costs to care for select patients at home.
Screening Staff	\$33.12	Staff to screen visitors and staff across 138 sites, with up to 4 FTEs per site.
Overtime Costs	\$157.0	Anticipated 3% overtime increase as staff stay home when sick
Recruitment and Training	\$44.1	Funding for health authority and HEABC recruitment activities, and for training 3,000 new entry level community/long-term care staff at an average \$12k/FTE.
Nurse Overtime	\$34.0	Funding for Working Short Premium for April and May, \$17M/month due to delays in the implementation of the patient care assessment tool due to the pandemic
Health Capacity	\$24.5	Funding for 31 FTEs for each Health Authority and for \$2.4M for the Ministry
Supply & Logistics	\$27.0	Funding to expand the supply management system across the province
PPE	\$146.7	Funding for additional personal protective equipment across the healthcare system
Lost Revenue	\$87.6	Funding to replace lost parking and other revenues, including out-of-country fees
Total	\$783.9	Funding for Recovery and Increased Health Capacity

Capital Funding for Facilities and Equipment

Description	Estimated Costs (\$M)	Comments
Renovations	\$45.0	Funding to renovate operating rooms, intensive care units and high-acuity units.
Beds & Stretchers	\$21.6	Additional 633 beds and stretchers to respond to surges in requirements.
Ventilators	\$12.0	Additional 488 ventilators to support critically ill patients across the province.
Monitors and Defibrillators	\$10.0	Additional monitors and defibrillators to supply ambulances and aircraft for the rural and remote strategy.
IT infrastructure	\$25.3	Enhance networks, hardware and software across Health Authorities.
Lab Testing Equipment	\$15.8	Additional testing equipment, freezers, safety cabinets and related equipment to enhance laboratory testing across the province.
BCCDC Warehouse Upgrades	\$4.3	Funding to replace and enhance vaccine refrigeration and cold storage handling systems at the BC Centre for Disease Control.
Medical Imaging	\$2.9	Additional hand-held and portable imaging equipment to limit multi-patient use.
Ambulances	\$12.5	Replace/refurbish 55 existing ambulances and purchase of 8 new ambulances
Total	\$150	Capital Funding for Facilities and Equipment

Conclusions

Conclusions

- Overall, and in line with the spring 2020 experience of the COVID-19 epidemic, 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 in-patient admission measures if required.**
- With planned **surge capacity** in place it will be less likely that changes to surgical planning and medical admissions would need to be considered. However, surge capacity **requires continued focus on strengthening health human resources** – hiring, training, and effective deployment remains a priority
- There will be a **staged approach to regionally managing surges in demand** in contrast to the system wide reduction in hospital bed occupancy used in March 2020.

- This staged approach will start by using assigned COVID-19 bed capacity in **nineteen COVID-19 sites** with only a small number of local cases across the remaining hospital sites. This approach is further supported by work underway to ensure a **responsive patient transportation and support service in rural areas** of the province.
- Health system capacity further strengthened by **additional measures to reduce normal historical demand on inpatient medical bed utilization** throughout the Fall/Winter of 2020/21
- **Ongoing need for sustaining the hierarchy of infection prevention and control measures across commercial, work, and social settings. This is critical to reducing pressure on our health human resources and health system.**