HEALTH SYSTEM READINESS FOR COVID-19

APRIL 8, 2020

Saskatchewan Health Authority

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PURPOSE

SHA services will adapt and expand to meet the projected COVID-19 patient demand, while continuing to deliver essential services to non-COVID-19 patients throughout the duration of the event.

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OUTLINE

- Introduction
- Saskatchewan COVID-19 Modelling
- Offence – Population Health, Public Health and Community Care
- Defence - Continuity of Health Services and Acute Surge Plan
- Questions

Dynamic Modelling Results for COVID-19

HEALTH SYSTEM READINESS FOR COVID-19

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INTRODUCTION

Dynamic modelling can help assess the impact, over time, of various “what if” scenarios to estimate:

- Transmission of COVID-19 in a population
- Impact of various public health interventions
- Impact on acute care demand

Dynamic modelling is not predictive, rather it provides information to support response and preparedness

The models continuously update as we learn more about COVID-19 and as we get more Canadian / Saskatchewan data

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ANALYSIS

Key variable is the basic reproductive constant (R_0):

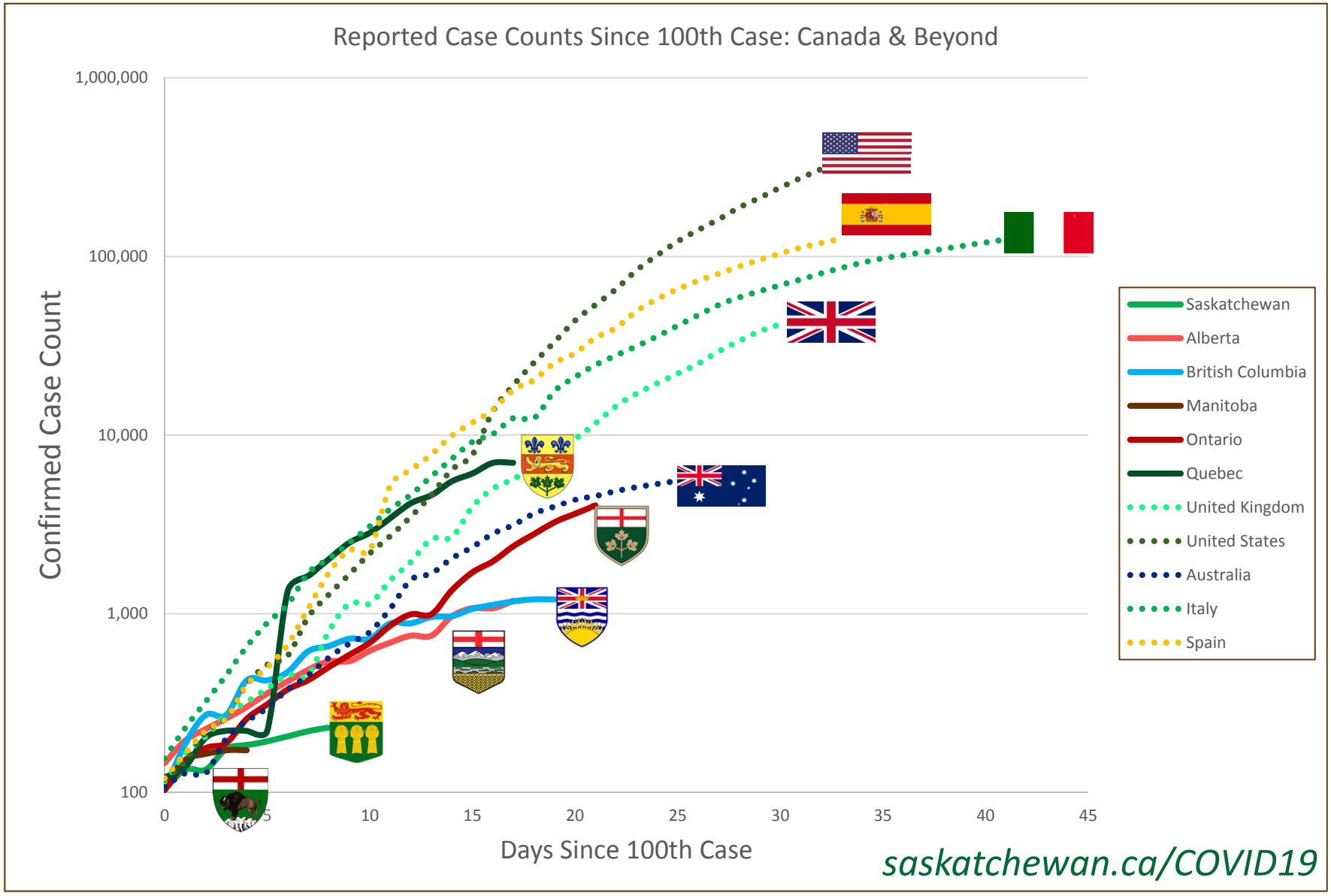
The average number of people one person with COVID-19 would infect

Modelling scenarios

- Scenario 1 – high range - $R_0 = 4.0$
- Scenario 2 – mid range - $R_0 = 2.76$
- Scenario 3 – low range - $R_0 = 2.4$

Estimates are **in addition** to the non-COVID-19 hospital capacity

CURRENT COVID-19 CASE COUNT



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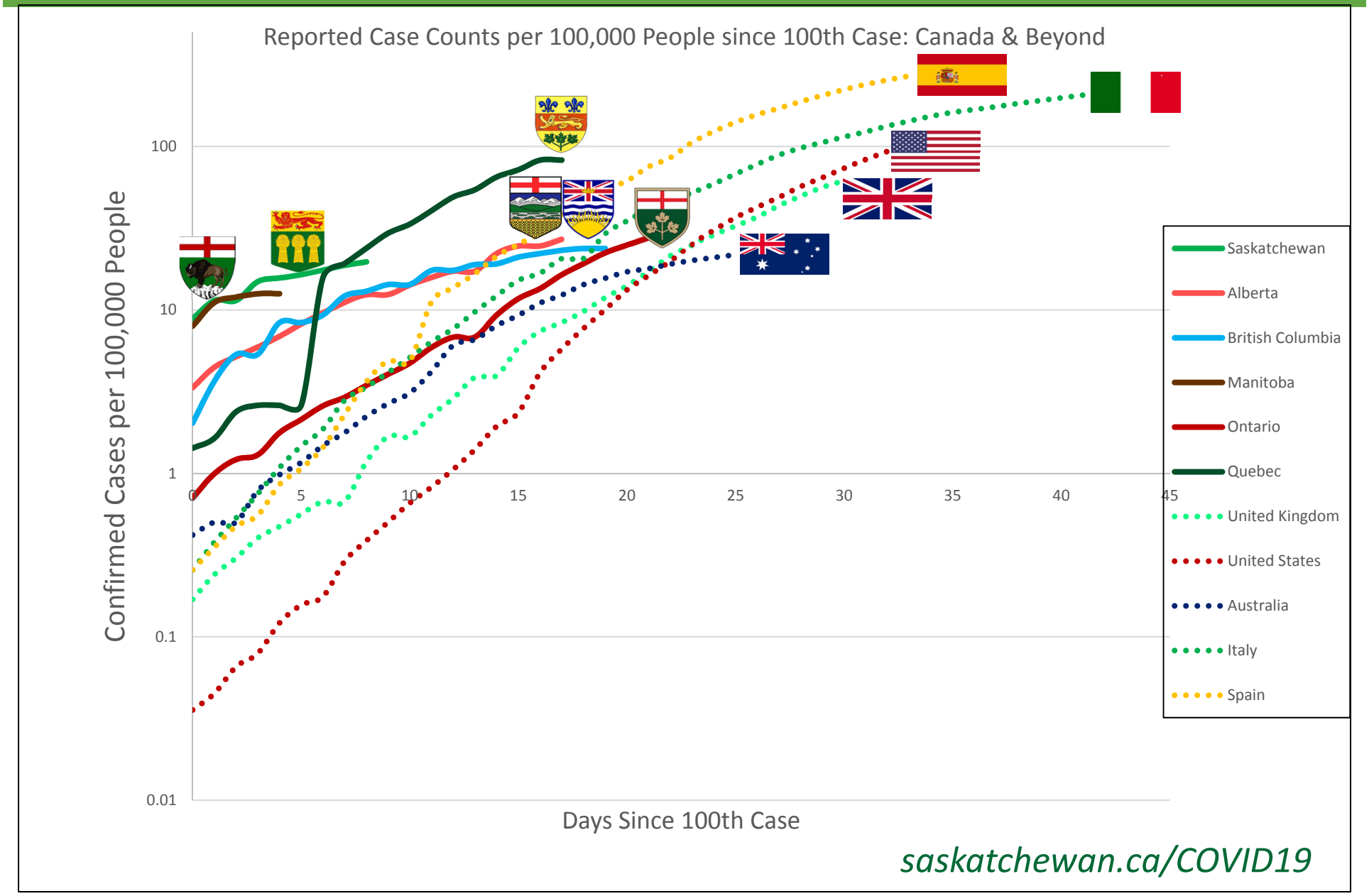
CURRENT COVID-19 CASE COUNTS PER 100,000 PEOPLE



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SCENARIO 1

Reproductive constant (R_0) 4.0 (High range from early Canadian estimates)

Assumption: Saskatchewan continues with current levels of COVID-19 measures including testing, tracing and physical distancing

Modelling Estimates:

- At the peak, 4,265 COVID-19 patients will require to be in an acute care hospital simultaneously
- Of those hospitalized, 1,280 COVID-19 patients will be in the ICU with 90-95% requiring ventilation

SCENARIO 2

Reproductive constant (R_0) 2.76 (low Italy range)

Assumption: Saskatchewan continues with current levels of COVID-19 measures including testing, tracing and physical distancing

Modelling Estimates:

- At the peak, 1,265 COVID-19 patients will require to be in an acute care hospital simultaneously
- Of those hospitalized, 380 COVID-19 patients will be in the ICU with 90-95% requiring ventilation

SCENARIO 3

Reproductive constant (R_0) 2.4 (Wuhan, Imperial Model)

Assumption: Saskatchewan continues with current levels of COVID-19 measures including testing, tracing and physical distancing

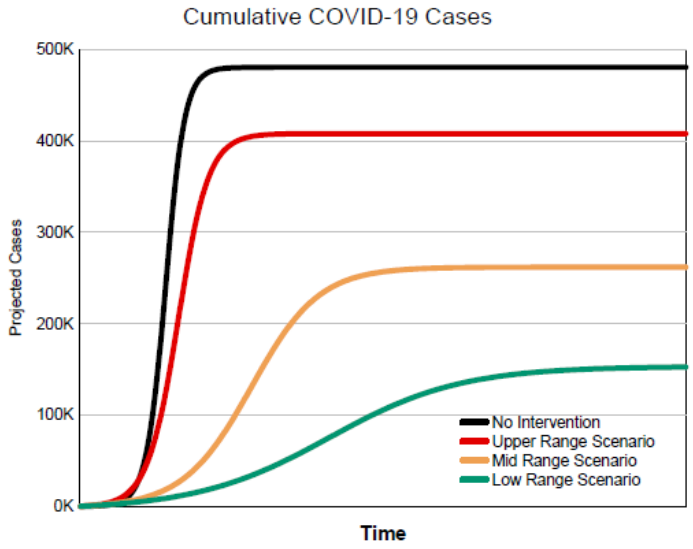
Modelling Estimates:

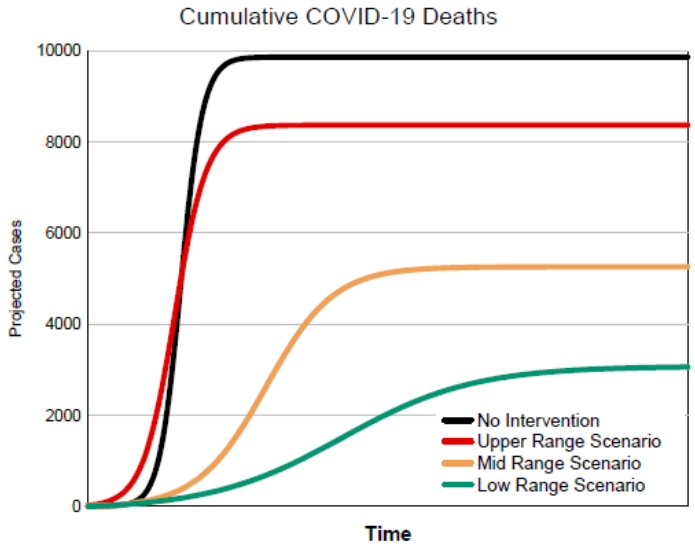
- At the peak, 390 COVID-19 patients will require to be in an acute care hospital simultaneously
- Of those hospitalized, 120 Covid-19 patients will be in the ICU with 90-95% requiring ventilation

ANALYSIS

COVID-19 patients only Peak values, except where cumulative	Upper Range Scenario 1 (R_0 = 4.0)	Mid Range Scenario 2 (R_0 = 2.76)	Low Range Scenario 3 (R_0 = 2.4)
Cumulative total cases	408,000	262,000	153,000
Hospital admissions/ day	710	205	60
Hospital census	4265	1265	390
ICU admissions /day	215	60	20
ICU census	1280	380	120
Patients requiring ventilation	1230	370	120
Cumulative total deaths	8370	5260	3075

TOTAL COVID-19 CASES AND DEATHS





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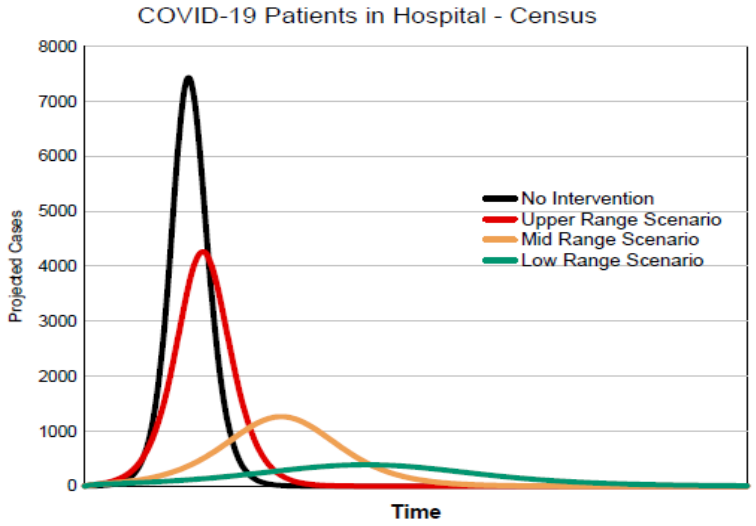
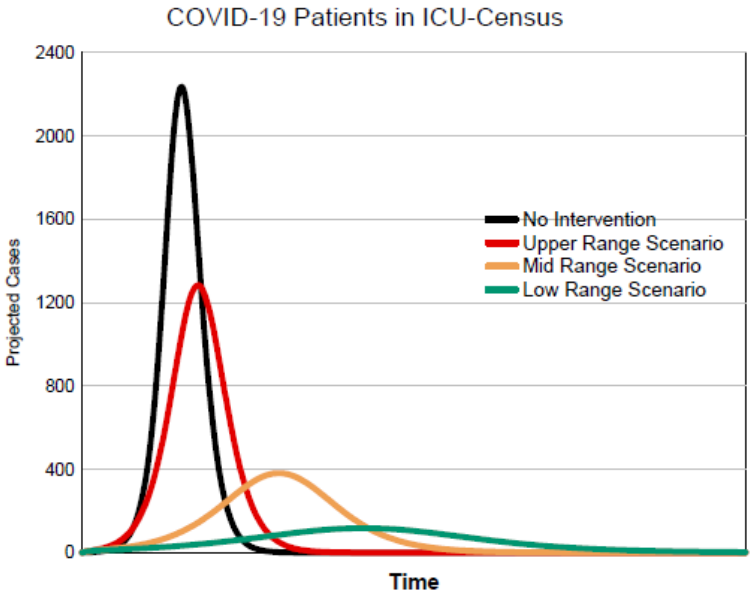
COVID-19 HOSPITAL CENSUS AND ICU CENSUS





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Key Messages

Dynamic modelling is not a prediction, it provides a range of "what if" scenarios to guide planning and will evolve over time

Current interventions have made a difference

The most important variable to save lives and protect health care workers is public compliance with isolation measures, physical distancing and washing your hands.

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THE BIG PICTURE

- **SHA Offensive Strategy**

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PLANNING AHEAD

- As we enter a new month, **the reality is hitting home** – Saskatchewan is not immune. We can expect more cases and deaths

- We are learning from the experience of other provinces and around the world – modelling scenarios are based on our best knowledge at this time and will continue to be updated with Saskatchewan data

- All models underscore the importance of aggressive and sustained **public health measures** and **population health approaches** to "flatten the curve"

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THE BIG PICTURE

- The Saskatchewan Health Authority has based our response to the COVID-19 pandemic on a strategy of **contain**, **delay, mitigate** and **population health promotion**

- **The COVID-19 pandemic involves everyone** – and individuals and communities will be affected in different ways

- Our goal is to promote health, prevent disease and ensure health care services are available

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PUBLIC HEALTH

Key strategies:

- Increasing testing (+14,000 tests performed)
- Identifying cases early
- Expanding contact tracing capacity (+300% increase in staff)
- Enforcing Chief Medical Health Officer orders
- Data tools to manage cases, clusters and outbreaks

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COMMUNITY CARE

Key strategies:

- Expanding HealthLine 811 (+250 staff trained)
- Delivering more services through virtual care models (+750 clinicians set up)
- Testing and assessment centres
  - 38 SHA operated Testing sites across the province
  - 5 Assessment Sites in operation with 21 planned to open in the coming weeks

POPULATION HEALTH

Key strategies:

- Prioritize testing
- Protect health care workers and first responders
- Screening in Long Term Care
- Partnering with communities and across sectors
- Messaging for health education, health promotion and health equity

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STRENGTHEN OUR OFFENCE

- We need to remember: these measures must be sustained to be effective

- We need to keep learning, understanding and removing barriers that prevent people from taking necessary action

- The COVID-19 global pandemic will continue for weeks and months to come – and we may not see the whole picture or understand its full impact until its over

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STRENGTHEN OUR OFFENCE

- Our strategy to fight COVID-19 includes both offensive and defensive lines:
  - Our offence includes – containment and delay (preventing community transmission) and population health promotion (strengthening resiliency)
  - Our defence includes – mitigation (ensuring health care services are available when needed)

- Language matters – **we are all playing for the same team and we win and lose together.**

No health system in the world can withstand this pressure without sustained help from the public.

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SHA DEFENSIVE STRATEGY

- **SHA Defensive Strategy**

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PRINCIPLES

- Meet the care needs of the province, with the goal of minimizing the loss of life by increasing capacity to provide care.
- Continuity of essential and urgent health services will be sustained for non-COVID patients. There will be disruptions to "normal" health services delivery. This may mean alternate service delivery methods such as virtual care.
- The response will be staged according to increases in demand.
- Cohorting of COVID-19 positive patients as much as possible. Field hospitals will be used where demand exceeds facility based capacity.
- Ethical decision making will occur throughout all aspects and phases of the pandemic based on the SHA Ethical Framework.
- We will need to deploy staff and physicians to other facilities to support care.
- Safety and Infection Prevention and Control will guide our work.
- Centralized bed flow coordination service to better serve all patients

DEFENSIVE STRATEGY - MITIGATE

- Ongoing implementation of a province wide slow down of non-essential/non-urgent services
    - Results to date: freed up more than 1,000 beds so far
  - Staged expansion of our acute care capacity
    - Phase in 57% more acute beds as needed
    - Increase intensive care beds from 98 ICU beds to 963 beds as needed
- Preservation of supplies
- Labour pool strategy
- Dedicated spaces for cohorting COVID-19 Patients
- Creation of designated COVID-19, non-COVID-19 and mixed hospitals as needed
- Creation of additional community treatment capacity

ACUTE SURGE CAPACITY PLANNING

PLANNING SCENARIOS

- Planning is based on the best information available as outlined in the modelling scenarios.
- Two scalable planning scenarios were created:

Planned Capacity:

- Based on a estimate of the patient demand between the high and mid-range modelling scenarios.
- Capacity that the system is activating immediately through a staged approach in response to patient demand.

Contingency Capacity:

- Based on a higher range estimate of patient demand.
- Capacity that would be planned for but accessed only if needed based on the evolving situation.

CURRENT CAPACITY

EXISTING CAPACITY INCLUDING IMPACT OF SERVICE SLOWDOWN

AREA	ICU Current State			Acute Current State		
	Current Average Daily Demand (Daily Census)	Current Capacity (ICU Beds)	Capacity minus Demand Total	Current Average Daily Demand (Daily Census)	Current Capacity (Acute Care Beds)	Capacity minus Demand
Regina	23	39	16	295	546	251
Saskatoon	14	32	18	525	808	283
Integrated Northern Health (INH)	11	13	2	227	381	154
Integrated Rural Health (IRH)	9	14	5	349	698	349
Saskatchewan	**57**	**98**	**41**	**1396**	**2433**	**1037**

SURGE CAPACITY

PLANNED CAPACITY INTENSIVE CARE

AREA	Current Daily ICU Census	COVID19 Critical Care Patients from Planning Scenario	Total ICU Patients at Peak	ICU Capacity During Surge	Capacity minus Demand Total ICU Patients
Regina	23	188	211	410	199
Saskatoon	14	230	244	342	98
INH	11	188	199	131	-68
IRH	9	227	236	80	-156
Saskatchewan	57	833	890	963	73

- Co-ordinated provincial approach will see critical care patients from Rural and North admitted to urban sites when local ICU capacity is exceeded.

SURGE CAPACITY

PLANNED CAPACITY ACUTE CARE

AREA	Current Daily Acute Care Census	COVID19 Acute Care Patients from Planning Scenario	Total Acute Patients at Peak	Acute Capacity During Surge	Field Hospital Capacity	Capacity minus Demand Total Acute Patients
Regina	295	437	732	425	400	93
Saskatoon	525	533	1058	975	250	167
INH	227	435	662	715	0	53
IRH	349	528	877	1065	0	188
Saskatchewan	1396	1933	3329	3180	650	501

SURGE CAPACITY

PLANNED VENTILATOR CAPACITY

- 450 ventilators are available to meet modelled demand for low and mid-range scenarios
- Planned capacity ventilator requirement of 860 creates a gap of 410 ventilators; however, there are confirmed orders for 200 with 100 expected in the next 2-3 weeks
- Multiple orders for invasive and non-invasive ventilators have been placed and SHA and the Ministry are working with vendors and the Federal government to close this gap

SHA INTEGRATED HEALTH AREA PLANS

HEALTH SYSTEM READINESS FOR COVID-19

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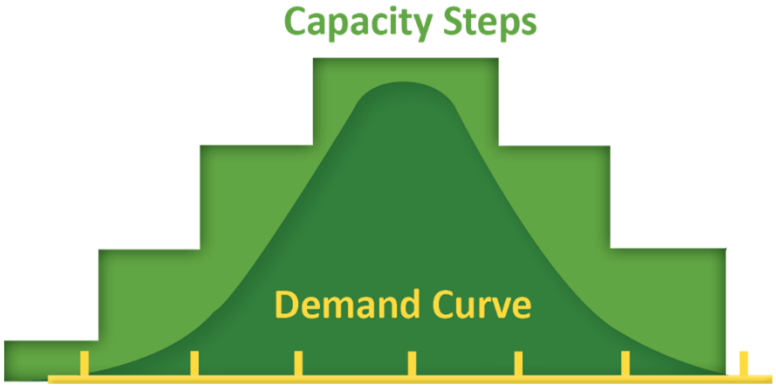
STAGED RESPONSE

Principles of staged response to increased demand:

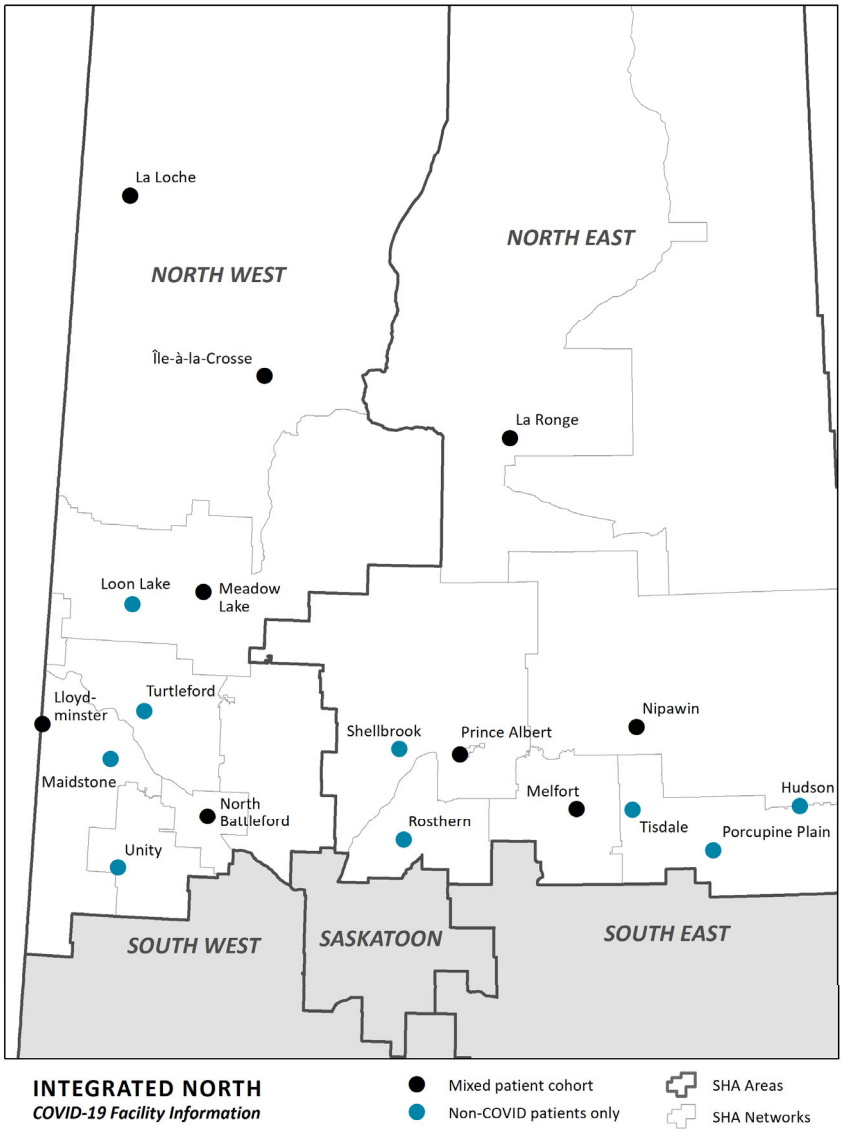
- Response is based on COVID-19 demand in a given geographical area
- Existing capacity will be accessed first before accessing expanded capacity
- COVID-19 patients will be cohorted on designated units.
- COVID-19 hospitals will initially act as mixed hospitals
  - As COVID-19 patient census increases, non-COVID patients may be relocated from the facility to non-COVID or mixed hospitals



INTEGRATED NORTHERN HEALTH

- **Staged response to increased demand** through a combination of mixed and non-COVID hospitals
- No facility closures
- Field hospitals for contingency scenario only

** Changes depicted on map not in effect immediately, phased in as required by patient demand/safety*



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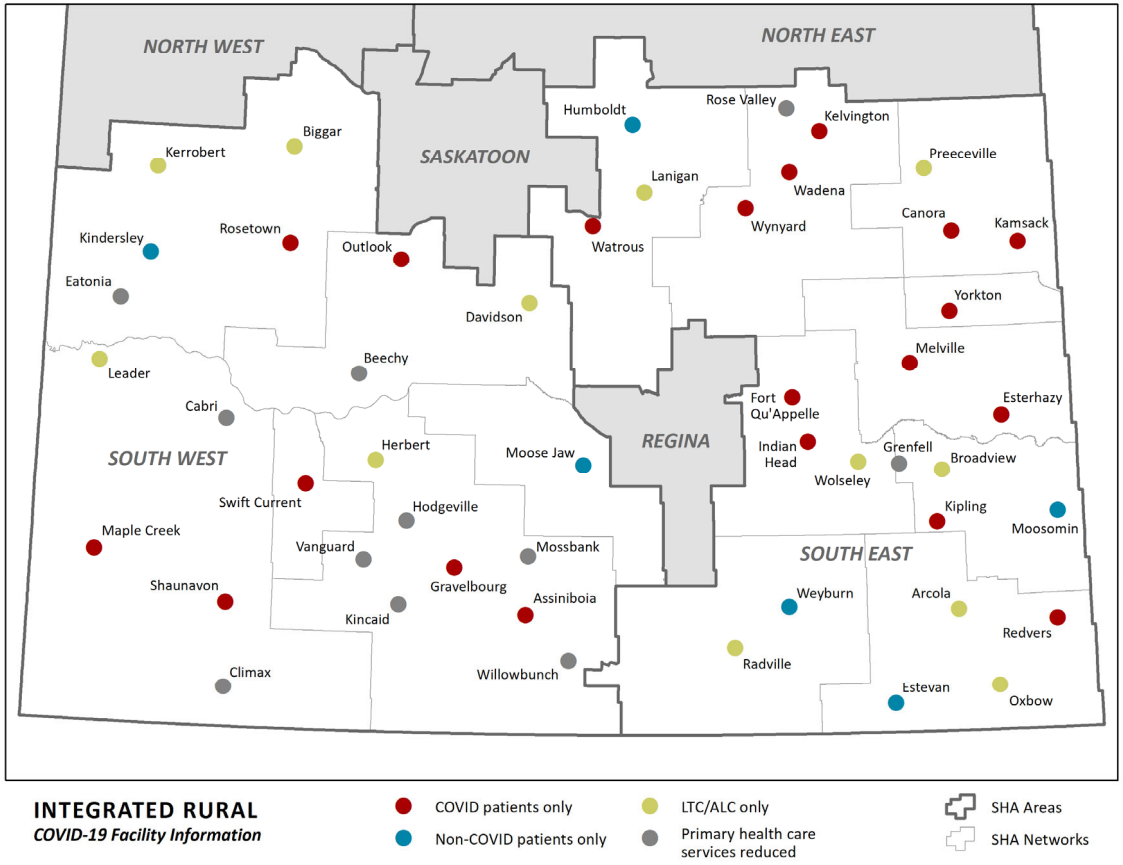
INTEGRATED RURAL HEALTH

- **Staged response to increased demand** through a combination of COVID and non-COVID facilities
- No facility closures
- Temporarily convert some hospitals to support alternative level of care patients over the next 4-6 weeks
  - *Alternate level of care patients will flow from tertiary and regional hospitals to create capacity in those locations*
  - *Temporary suspension of Emergency Department services to support reallocation of staff to higher need sites*
- No field hospitals contemplated (capacity exists)

INTEGRATED RURAL HEALTH

Facility	Services
🔴	COVID-19 hospital - Staged stand up based on demand - COVID patients only - Emergency services open
🔵	Non-COVID hospital - Staged stand up based on demand - Non-COVID patients admitted - Emergency services open
🟡	Temporary conversion to alternate level of care patients - Stand up starts **immediately and phased over 4-6 weeks** - Temporary suspension of emergency services
⚫	Primary health care services reduced - Care provided through alternate means such as virtual care



** Changes depicted on map are phased in as required by patient demand/safety*

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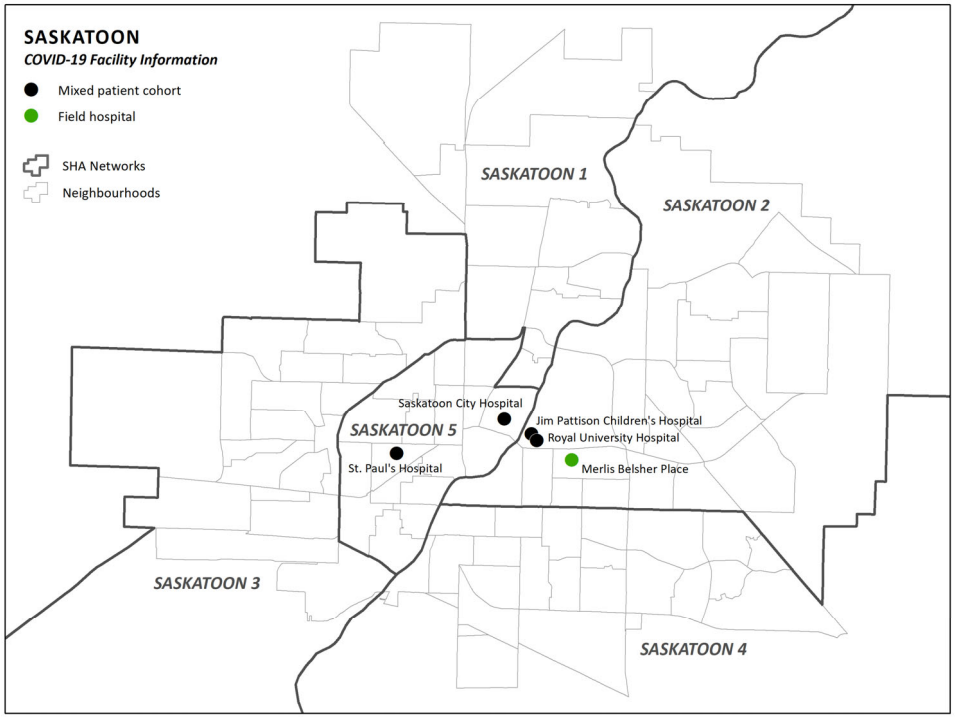
SASKATOON

DEFENCE – ACUTE SURGE

- **Staged response to increased demand** using mixed hospitals that serve COVID and non-COVID patients
- Patients cohorted by units and by floor
- Additional LTC beds secured at Parkridge Centre and Geriatric Unit
- Owned and affiliated LTC sites also expanding capacity
- Field hospital planned



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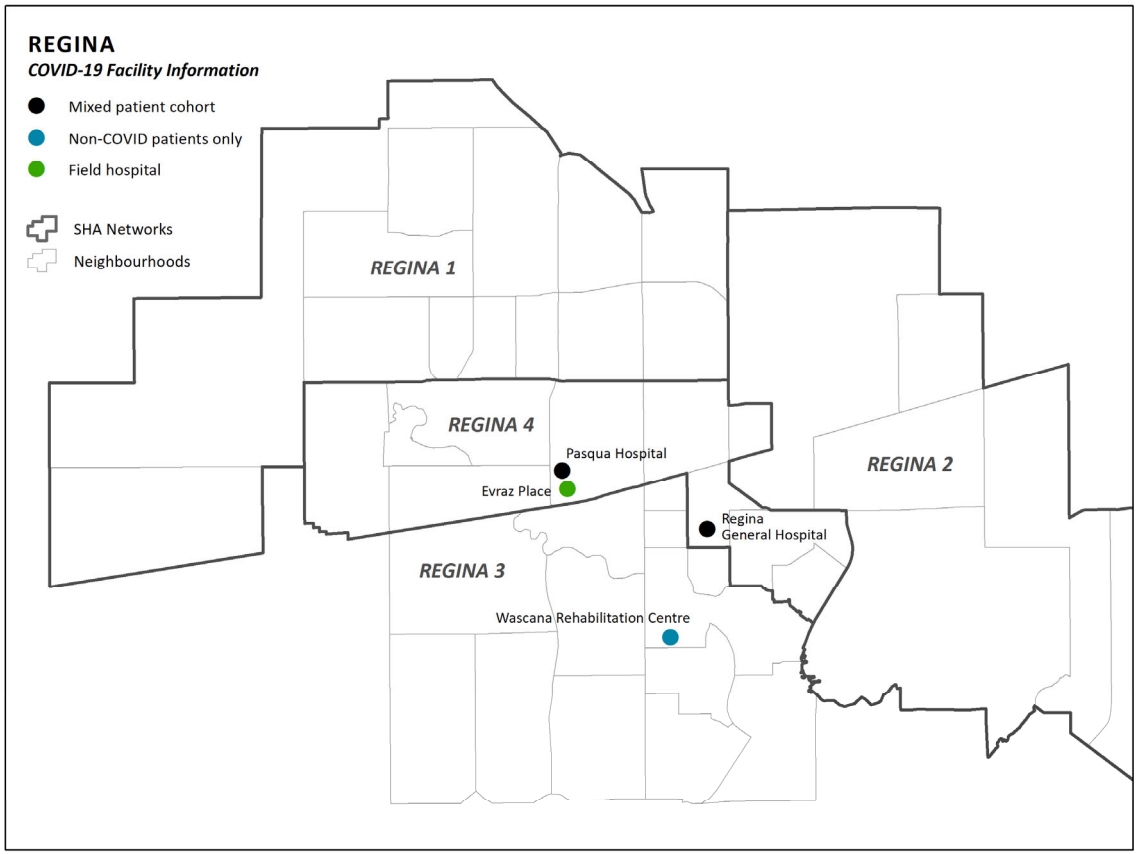
REGINA

DEFENCE – ACUTE SURGE

- **Staged response to increased demand** using mixed hospitals that serve COVID and non-COVID patients
- Patients cohorted by units and by floor
- Accessing Wascana Rehabilitation Centre for non-COVID
- Owned, affiliated and community LTC sites also expanding capacity
- Field hospital planned



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SUMMARY

- Modelling information provides range of scenarios of potential trajectories of COVID-19 in Saskatchewan
- Offensive strategy is focused on containment and delay of the virus – flatten the curve

Public response has the biggest impact on the outcome

- Defensive strategy prepares surge capacity in acute facilities for patient demand

We're all in this together and we need your help

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Healthy People, Healthy Saskatchewan

The Saskatchewan Health Authority works in the spirit of truth and reconciliation, acknowledging Saskatchewan as the traditional territory of First Nations and Métis People.

APPENDIX: SHA INTEGRATED HEALTH AREA FACILITIES

HEALTH SYSTEM READINESS FOR COVID-19

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DEFENCE – ACUTE SURGE

Mixed Hospitals	Non-COVID Hospitals
Victoria (Prince Albert)*	Maidstone
Battlefords Union*	Unity
Lloydminster*	Turtleford
Nipawin	Loon Lake
Melfort	Shellbrook
Meadow Lake	Rosthern
Ile-a-la-Crosse	Tisdale
La Ronge	Porcupine Plain
La Loche hospitals	Hudson Bay

*** = regional hospital**

DEFENCE – ACUTE SURGE

COVID Hospitals (phased in as required by patient demand/safety)		Non-COVID Hospitals	Temporary conversion to Alternate Level of Care (phased over 4-6 weeks)
Swift Current *	Indian Head	**Moose Jaw ***	Kerrobert
Yorkton *	Fort Qu'Appelle	Kindersley	Biggar
Maple Creek	Wynyard	Weyburn	Davidson
Kipling	Outlook	Estevan	Leader
Wadena	Assiniboia	Humboldt	Herbert
Canora	Shaunovan	Moosomin	Lanigan
Redvers	Watrous		Wolseley
Gravelbourg	Melville		Arcola
Esterhazy	Rosetown		Oxbow
Kelvington			Radville
Kamsack			Preeceville
			Broadview
*** = regional hospital**			

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SASKATOON

DEFENCE– ACUTE SURGE

Site	Planned Non-COVID Beds	Planned COVID Beds
Saskatoon City Hospital	35	272
St. Paul's Hospital	61	291
Royal University Hospital	205	453
Field Hospital at Merlis Belcher Place	0	250
Total	301	1266
JPCH	149 beds (base) plus 52 beds (surge) for COVID and non-COVID	

REGINA

DEFENCE – ACUTE SURGE

Site	COVID ICU/Critical Care Beds	COVID Acute (Med/Surg)	Non-COVID care ICU/Critical Care	Non-COVID care Acute (Med/Surg)
Regina General Hospital (RGH)	166	198 + an additional 11 beds for Cardiac monitoring	33 with PACU	41
Pasqua Hospital (PH)	193	95	18	11 for surgical patients as PH will be the site for COVID neg surgeries-those that cannot be performed at RGH
Wascana Rehabilitation Center	0	0	0	80
Field Hospital at Evraz Place	0	200	0	200
Total	359	493	51	332