COVID-19 Modelling and Health System Readiness Update

April 28, 2020

www.saskatchewan.ca/COVID19
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.
• Introduction
• Saskatchewan COVID-19 Modelling Update
• Offensive Strategy Update
• Defensive Strategy Update
• Resumption of Health Services
• Questions
Saskatchewan COVID-19 Modelling Update
### KEY DEFINITIONS

<table>
<thead>
<tr>
<th>BASIC REPRODUCTIVE NUMBER ($R_0$)</th>
<th>EFFECTIVE REPRODUCTIVE NUMBER ($R_t$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of people one person with the virus could infect where the entire population is susceptible and no interventions have been undertaken.</td>
<td>Average number of people one person with the virus infects at the current time after the effects of interventions.</td>
</tr>
<tr>
<td>Purpose: support planning for health system readiness.</td>
<td>Purpose: guide decisions about public health measures.</td>
</tr>
</tbody>
</table>

Note: April 8 modelling presentation was based on Basic Reproductive Number ($R_0$)
Case count per 100,000 people similar to BC

“Flattening the curve” with a hammer
COVID-19 GOOGLE COMMUNITY MOBILITY REPORTS

Saskatchewan

- Retail & recreation: -43% compared to baseline
- Grocery & pharmacy: -12% compared to baseline
- Parks: +4% compared to baseline
- Transit stations: -53% compared to baseline
- Workplace: -48% compared to baseline
- Residential: +20% compared to baseline

https://www.google.com/covid19/mobility/

Saskatchewan Health Authority saskatchewan.ca/COVID19
CANADA

- Retail & recreation: -53% compared to baseline
- Grocery & pharmacy: -22% compared to baseline
- Parks: -22% compared to baseline

- Transit stations: -67% compared to baseline
- Workplaces: -59% compared to baseline
- Residential: +27% compared to baseline

Mobility trends for places like restaurants, cafes, shopping centers, theme parks, museums, libraries, and movie theaters.

Mobility trends for places like grocery markets, food warehouses, farmers markets, specialty food shops, drug stores, and pharmacies.

Mobility trends for places like national parks, public beaches, marinas, dog parks, plazas, and public gardens.

Mobility trends for places like public transport hubs such as subway, bus, and train stations.

Mobility trends for places of work.

Mobility trends for places of residence.

https://www.google.com/covid19/mobility/
EFFECTIVE REPRODUCTIVE NUMBER ($R_t$)

• Describes how well the various interventions are decreasing the spread of COVID-19 at the current time
• Also reflects fluctuating public compliance
• Once $R_t < 1$, virus is at the tipping point
• $R_t$ consistently $< 1$ is a major consideration in determining public health measures
• ‘The Hammer and the Dance’

Effective Reproductive Number in SK
April 25 $R_t = 0.7$ (lagging indicator up to 14 days)
This reflects strong SK compliance with public health measures

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SK’S EFFECTIVE REPRODUCTIVE NUMBER ($R_t$)
$R_0$ = Average number of people one person with the virus could infect where the entire population is susceptible and no interventions have been undertaken.

- Previously, no history of how it spreads in Saskatchewan, so needed to use what we knew from other areas that had experience

- SK case data has been used to estimate a SK $R_0$ of 3.12, to guide planning activities for a worst case scenario
BASIC REPRODUCTIVE NUMBER ($R_0$) IN SK

Saskatchewan’s Worst Case Planning Scenario ($R_0$)

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

• The $R_t$ value is helpful in determining effectiveness of current interventions right now, and can be a guidepost to use when choosing to implement new measures, or loosen existing ones.

• Early warning system shared with the public is key during the ‘dance.’

Effective Reproductive Number in SK
April 25 $R_t= 0.7$
(lagging indicator up to 14 days)

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Offensive Strategy Update

Update: COVID-19 Modelling and Health System Readiness
• Our offensive strategy continues to progress and is rooted in the SHA’s service delivery model: Connected Care for the People of Saskatchewan

• As the province begins to re-open, care in the community remains the foundation of our health care system

• The SHA has already implemented a number of initiatives to support care in community to reduce the burden on the acute care system
Testing strategy supports contain and delay approach

- Broad availability of testing based on guidelines that support testing for virtually anyone with even a single symptom

- Work to further scale up testing is in progress including:
  - Testing asymptomatic contacts identified through public health contact and outbreak investigations
  - Outreach to populations less likely to seek testing
  - Sending consistent messages to the public and health care providers regarding testing

- Over 50 testing sites are located across the province, including 18 on First Nations

- Lab capacity is available to support more than 1,500 tests per day
  - Ongoing expansion of access to rapid testing capability with GeneExpert equipment across 8 sites to date with 11 more sites in coming weeks (inclusive of SHA supporting 4 First Nations sites)
Contact tracing surge plan

- Adoption of SHA Contact Tracing Application to streamline the process and enhance reporting and monitoring
  - Saskatchewan is a leader in adoption of this common application

- Load leveling of resources across the province to support outbreaks

- Surge capacity available to stay ahead of demand and respond to outbreaks
  - Current capacity available for more than 300 new cases per day
  - Modelled potential new cases per day of 618 was used to inform planned capacity of 460 full time equivalent staff
Assessment and treatment sites
• 16 sites available across Saskatchewan and more opening soon

Virtual Care
• Total clinician users: 2,000
• Total sessions: 35,000

Protecting our most vulnerable
• Early implementation of screening of staff and visitors in long-term care facilities
• Cohorting strategy to restrict staff to work in a single facility

Continuation of home care services, maintaining Seniors House Calls and Community Paramedicine programs

Meeting the needs of our vulnerable populations and supporting the homeless

Contingency plans to use hotels to cohort COVID-19 positive patients who require intermediate care
Defensive Strategy Update

Update: COVID-19 Modelling and Health System Readiness
• Opportunity to adjust planning scenario based on updated modelling information
• Sustain conservative capacity estimates and contingency to be prepared for a worst case surge
• Retain staged response to patient demand
<table>
<thead>
<tr>
<th></th>
<th>Upper Range Scenario 1 ($R_0 = 4.0$)</th>
<th>Original Planning Scenario</th>
<th>Mid Range Scenario 2 ($R_0 = 2.76$)</th>
<th>Low Range Scenario 3 ($R_0 = 2.4$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COVID-19 patients only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak values, except where</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cumulative</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cumulative total cases</td>
<td>408,000</td>
<td>335,000</td>
<td>262,000</td>
<td>153,000</td>
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<td>Hospital admissions/ day</td>
<td>710</td>
<td>458</td>
<td>205</td>
<td>60</td>
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<tr>
<td>Hospital census</td>
<td>4,265</td>
<td>2,765</td>
<td>1,265</td>
<td>390</td>
</tr>
<tr>
<td>ICU admissions /day</td>
<td>215</td>
<td>138</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>ICU census</td>
<td>1,280</td>
<td>830</td>
<td>380</td>
<td>120</td>
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<tr>
<td>Patients requiring ventilation</td>
<td>1,230</td>
<td>800</td>
<td>370</td>
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<tr>
<td>Cumulative total deaths</td>
<td>8,370</td>
<td>6,815</td>
<td>5,260</td>
<td>3,075</td>
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## PLANNING SCENARIO

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<tr>
<th>COVID-19 patients only</th>
<th>Upper Range Scenario 1 (R₀ = 4.0)</th>
<th>Original Planning Scenario</th>
<th>Sask Age Stratified Scenario (R₀=3.12)</th>
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**Revised Planning Scenario:**
- Ensures SK remains prepared for a major surge
- Informed SK R₀ in new modelling
- Max capacity can be reduced by 1,000 hospital beds, 400 ICU beds, 400 ventilators (total ventilators in planned scenario of 403 are within current ventilator capacity of 486 ventilators)

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• SHA is currently adjusting local surge plans based on the updated planning scenario
• Cohorting of COVID-19 patients forms the foundation of a staged response
• Staged activation of COVID-19, non-COVID-19 and mixed hospitals remains part of the response plan
• Timing and trigger points for deployment of the plan may be adjusted
Prepare field hospitals with two stages of activation:

- **Stage one**: Required base infrastructure preparation complete and equipment available for activation within a predetermined amount of time
- **Stage two**: Capacity available for expansion of services as needed

<table>
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<tr>
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<th>Stage 1 Beds</th>
<th>Stage 2 Additional Beds</th>
<th>Total beds</th>
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<tr>
<td>Saskatoon (Merlis Belsher)</td>
<td>125</td>
<td>125</td>
<td>250</td>
</tr>
<tr>
<td>Regina (Evraz Place)</td>
<td>184</td>
<td>216</td>
<td>400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>309</strong></td>
<td><strong>341</strong></td>
<td><strong>650</strong></td>
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Health System Service Resumption

Update: COVID-19 Modelling and Health System Readiness
SHA and Ministry of Health are developing a plan to resume, in a staged approach, community services, elective surgeries and diagnostics that were impacted by the service slowdown.

The plan will include a methodical and cautious reintroduction of services.

Identification of which services to resume will consider factors such as highest priority patient needs, risk of transmission of the virus, impact on COVID-19 surge capacity, impact on personal protective equipment inventory, and other considerations.

The system must remain able to respond to potential COVID-19 surge in demand.
• Updated modelling information provides insight into Saskatchewan situation and potential scenarios

• Offensive strategy aims to sustain low rates of transmission

  Continued vigilance by the public has the most impact

• Defensive strategy provides surge capacity for potential future demand

• Resumption of Health Services plan will be phased to support non-COVID-19 patient care while ensuring ability to respond to potential COVID-19 surge in demand
QUESTIONS
COVID-19 Modelling and Health System Readiness Update

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.