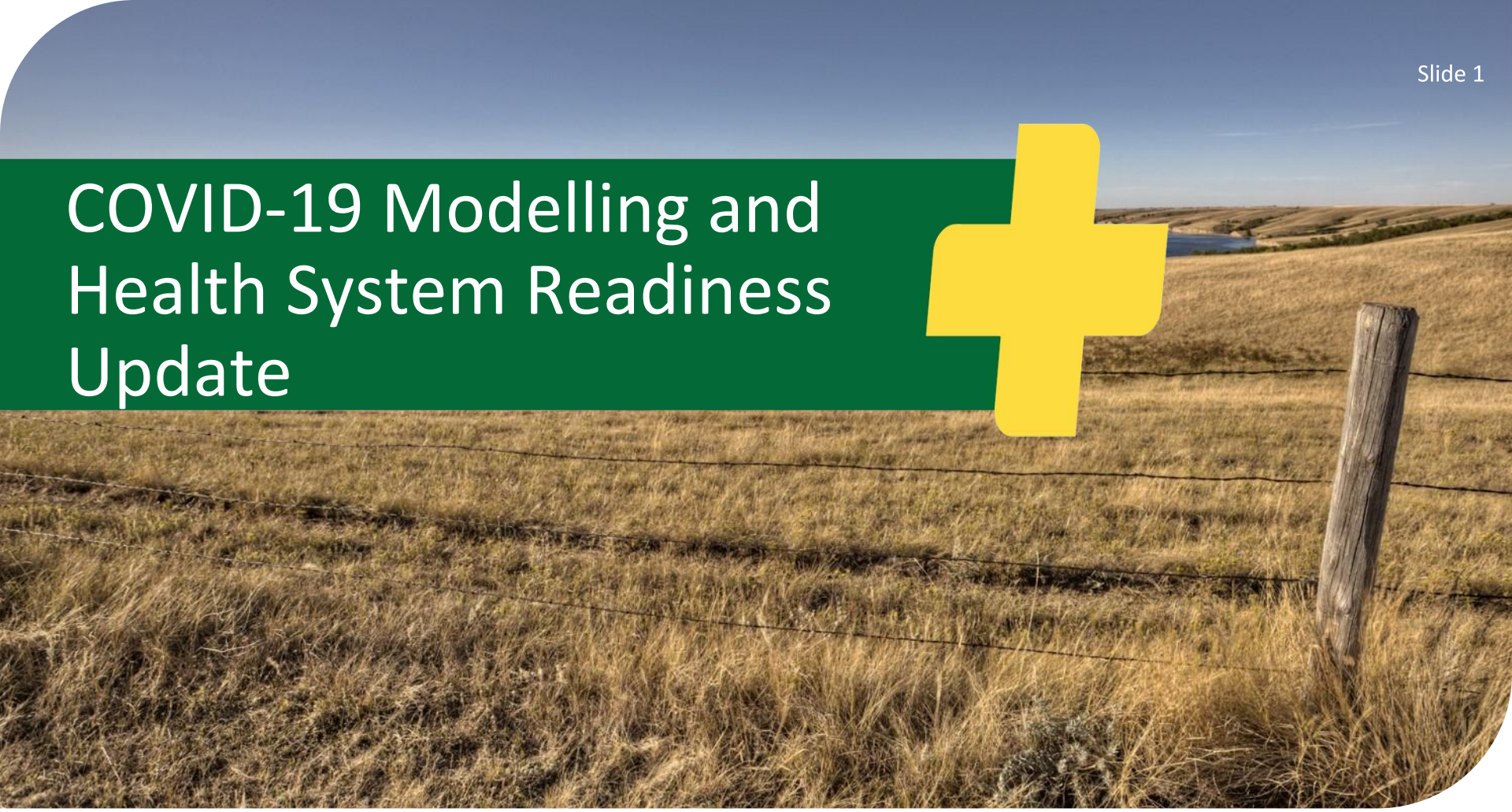
COVID-19 Modelling and Health System Readiness Update



April 28, 2020

Saskatchewan Health Authority

www.saskatchewan.ca/COVID19

This presentation is EMBARGOED until 2:30 p.m. on Tuesday, April 28, 2020

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.

Saskatchewan Health Authority

saskatchewan.ca/COVID19

OUTLINE

- Introduction
- Saskatchewan COVID-19 Modelling Update
- Offensive Strategy Update
- Defensive Strategy Update
- Resumption of Health Services
- Questions

Saskatchewan COVID-19 Modelling Update

Update: COVID-19 Modelling and Health System Readiness

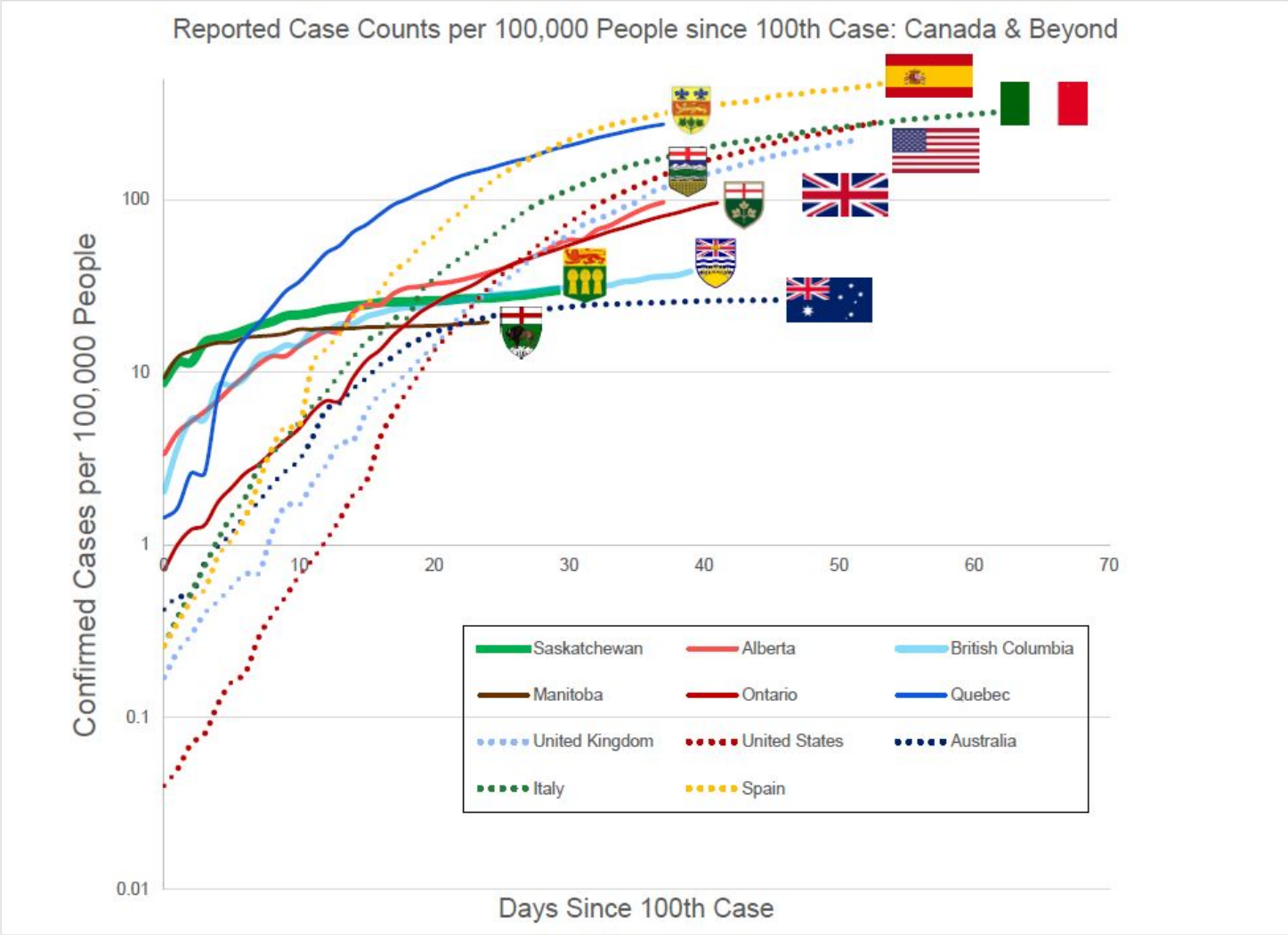
Saskatchewan Health Authority

KEY DEFINITIONS

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

Note: April 8 modelling presentation was based on Basic Reproductive Number (R_0)

HOW IS SK DOING WITH CURRENT INTERVENTIONS



Case count per 100,000 people similar to BC

"Flattening the curve" with a hammer

Saskatchewan Health Authority

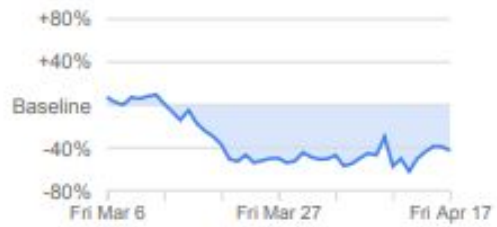
saskatchewan.ca/COVID19

COVID-19 GOOGLE COMMUNITY MOBILITY REPORTS

Saskatchewan

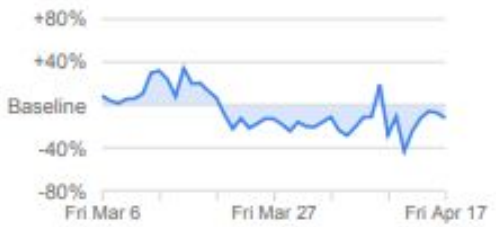
Retail & recreation

-43% compared to baseline



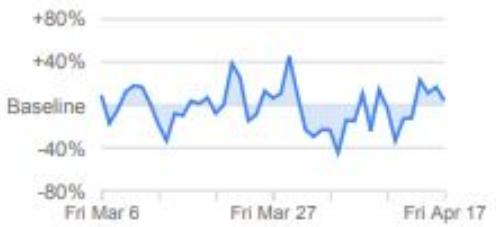
Grocery & pharmacy

-12% compared to baseline



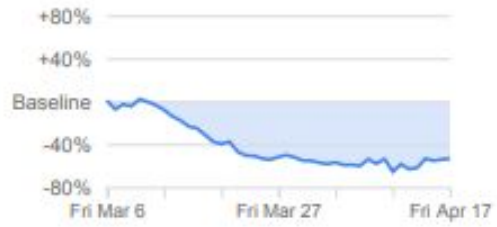
Parks

+4% compared to baseline



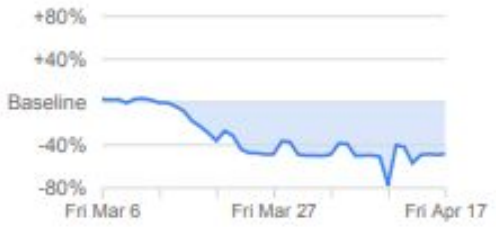
Transit stations

-53% compared to baseline



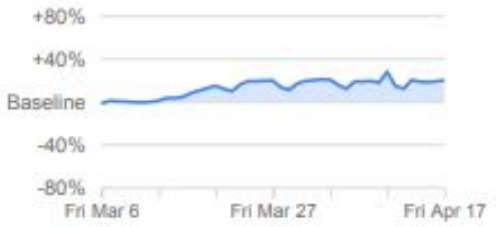
Workplace

-48% compared to baseline



Residential

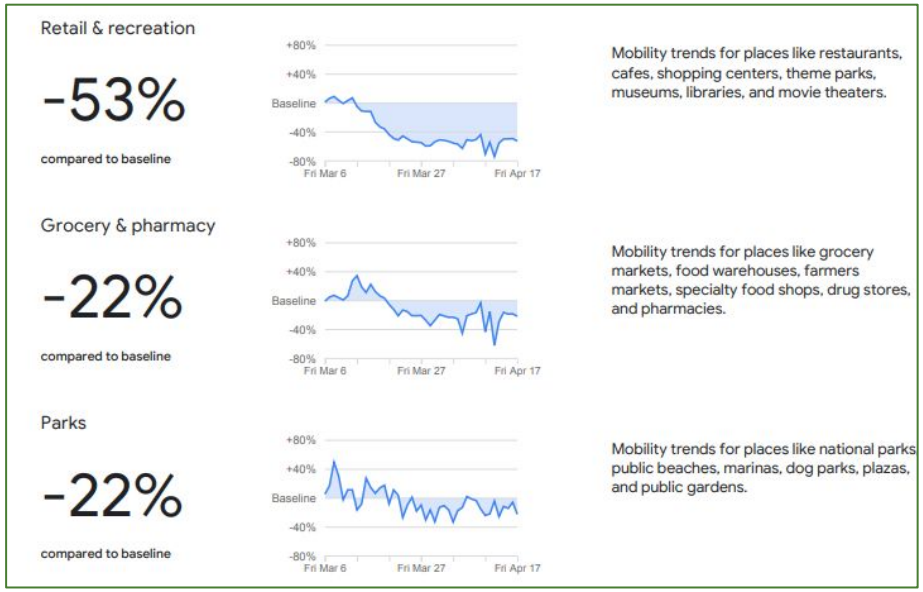
+20% compared to baseline

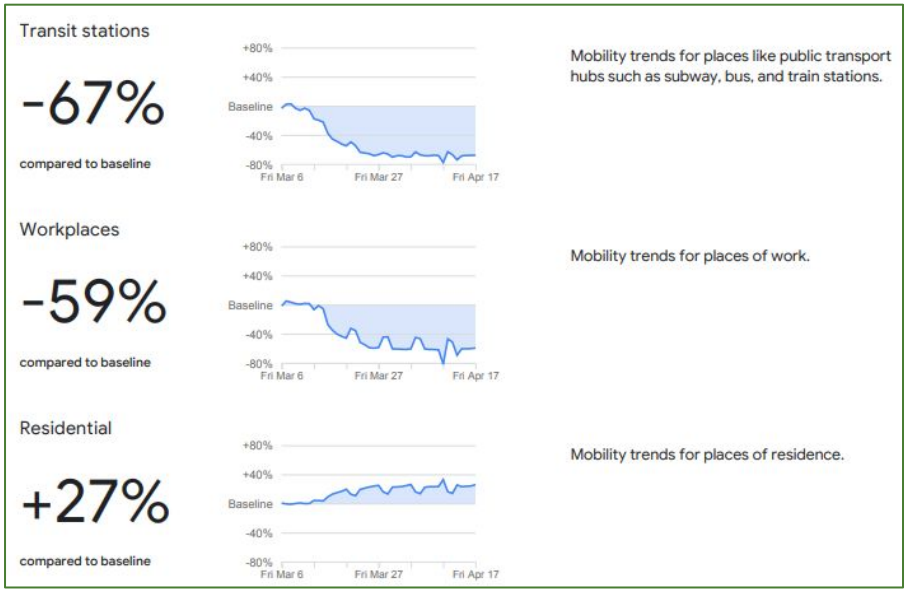


https://www.google.com/covid19/mobility/

COVID-19 GOOGLE COMMUNITY MOBILITY REPORTS

CANADA





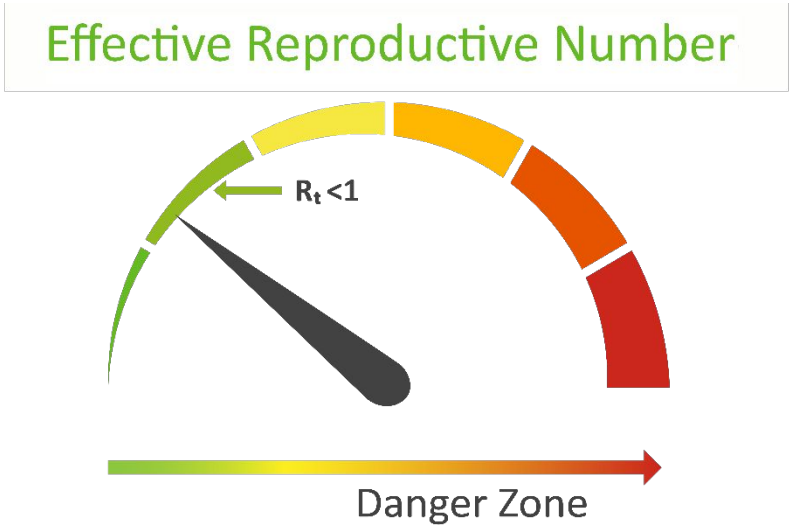
https://www.google.com/covid19/mobility/

Saskatchewan Health Authority

saskatchewan.ca/COVID19

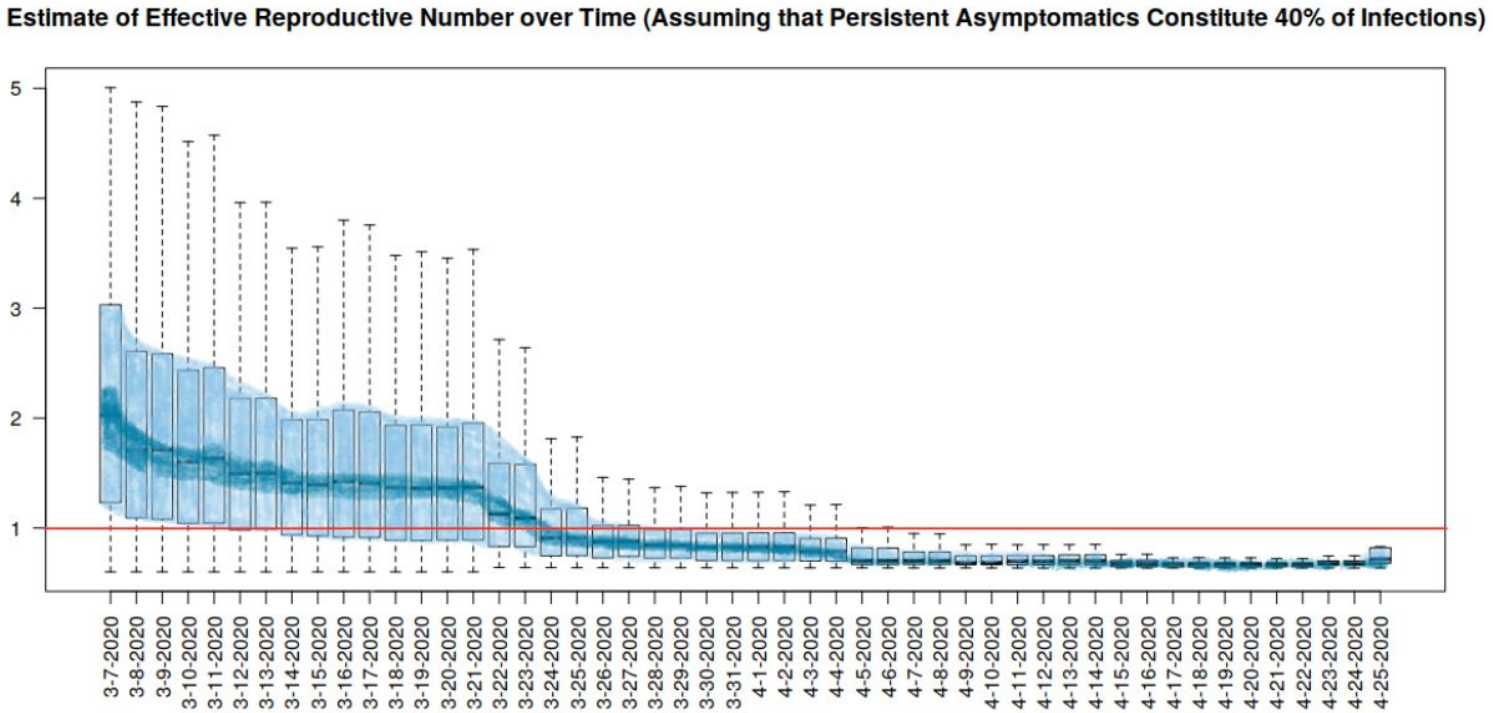
EFFECTIVE REPRODUCTIVE NUMBER (R_t)

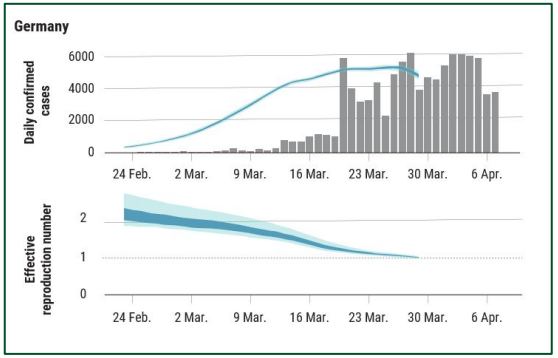
- Describes how well the various interventions are decreasing the spread of COVID-19 at the current time
- Also reflects fluctuating public compliance
- Once R_t<1, virus is at the tipping point
- R_t consistently <1 is a major consideration in determining public health measures
- *'The Hammer and the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

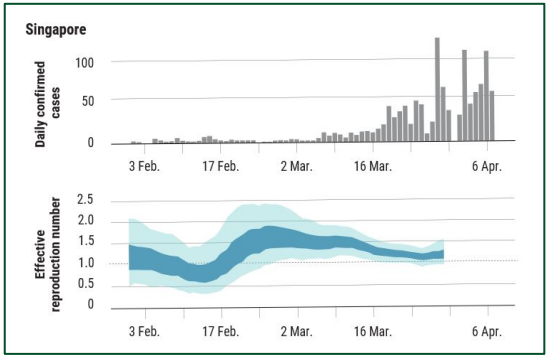


Effective Reproductive Number in SK
April 25 R_t= 0.7 *(lagging indicator by 7-14 days)*
This reflects strong SK compliance with public health measures

SK'S EFFECTIVE REPRODUCTIVE NUMBER (R_t)







Saskatchewan Health Authority

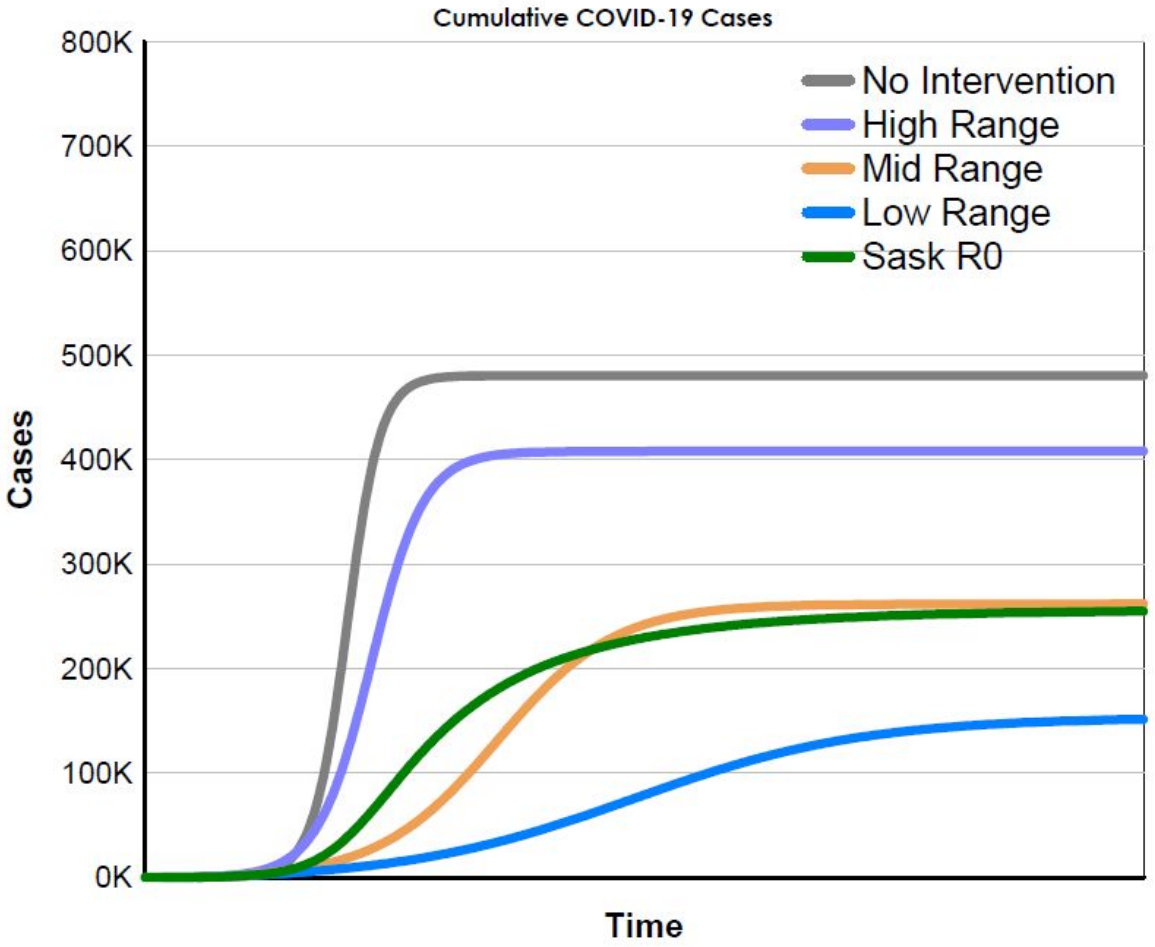
BASIC REPRODUCTIVE NUMBER (R_0) IN SK

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



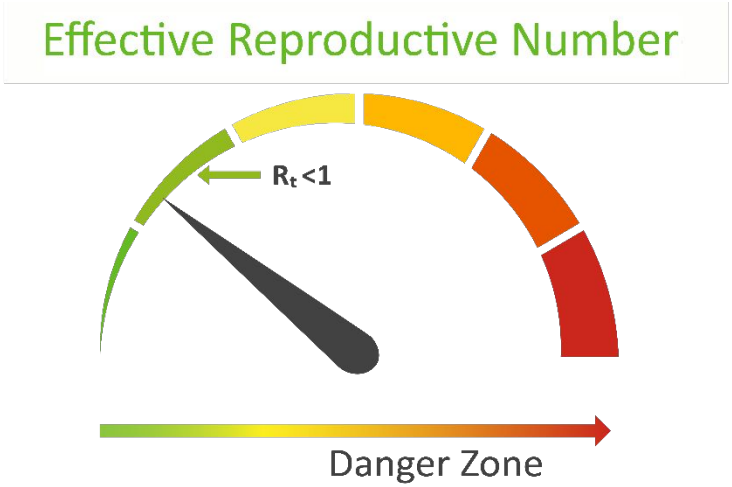
Saskatchewan's Worst Case Planning Scenario (R_0)

Saskatchewan Health Authority

saskatchewan.ca/COVID19

KEY MESSAGES

- **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 by 7-14 days)

saskatchewan.ca/COVID19

Offensive Strategy Update

Update: COVID-19 Modelling and Health System Readiness

Saskatchewan Health Authority

COMMUNITY SURGE PLAN

- 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

COMMUNITY SURGE PLAN

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)

COMMUNITY SURGE PLAN

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

COMMUNITY SURGE PLAN

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

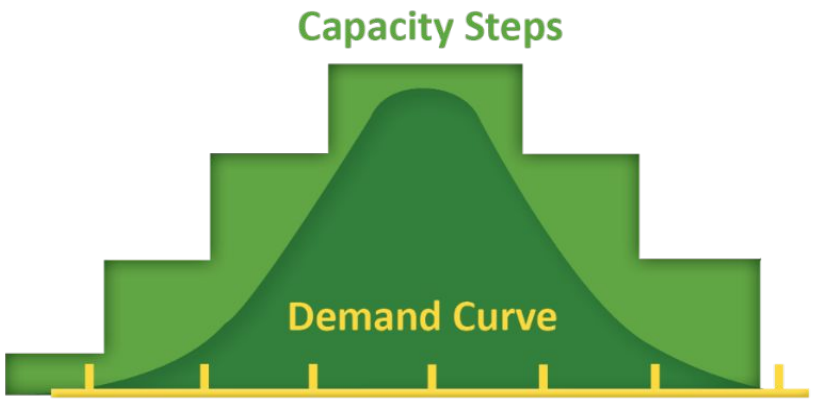
Defensive Strategy Update

Update: COVID-19 Modelling and Health System Readiness

Saskatchewan Health Authority

ACUTE SURGE PLANNING

- 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



ORIGINAL PLANNING SCENARIO

Planning Scenario mid-point between

COVID-19 patients only Peak values, except where cumulative	Upper Range Scenario 1 (R_0 = 4.0)	Original Planning Scenario	Mid Range Scenario 2 (R_0 = 2.76)	Low Range Scenario 3 (R_0 = 2.4)
Cumulative total cases	408,000	335,000	262,000	153,000
Hospital admissions/ day	710	458	205	60
Hospital census	4,265	2,765	1,265	390
ICU admissions /day	215	138	60	20
ICU census	1,280	830	380	120
Patients requiring ventilation	1,230	800	370	120
Cumulative total deaths	8,370	6,815	5,260	3,075

PLANNING SCENARIO

Revised Planning Scenario

COVID-19 patients only Peak values, except where cumulative	Upper Range Scenario 1 (R_0 = 4.0)	Original Planning Scenario	Sask Age Stratified Scenario (R_0=3.12)
Cumulative total cases	408,000	335,000	254,756
Hospital admissions/ day	710	458	190
Hospital census	4,265	2,765	1,736
ICU admissions /day	215	138	60
ICU census	1,280	830	412
Patients requiring ventilation	1,230	800	403
Cumulative total deaths	8,370	6,815	3,050

Revised Planning Scenario:

- Ensures SK remains prepared for a major surge
- Informed SK R_0 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)

PLANNING UPDATE

- 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

FIELD HOSPITALS

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

	Stage 1 Beds	Stage 2 Additional Beds	Total beds
Saskatoon (Merlis Belsher)	125	125	250
Regina (Evraz Place)	184	216	400
Total	309	341	650

Health System Service Resumption

Update: COVID-19 Modelling and Health System Readiness

Saskatchewan Health Authority

HEALTH SYSTEM SERVICE RESUMPTION

- 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

SUMMARY

- 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

Saskatchewan Health Authority

COVID-19 Modelling and Health System Readiness Update

Saskatchewan Health Authority

saskatchewan.ca/COVID19

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.