City of Saskatoon

A Review of COVID -19 Statistics
Week ending June 23, 2021

Revised & Condensed version

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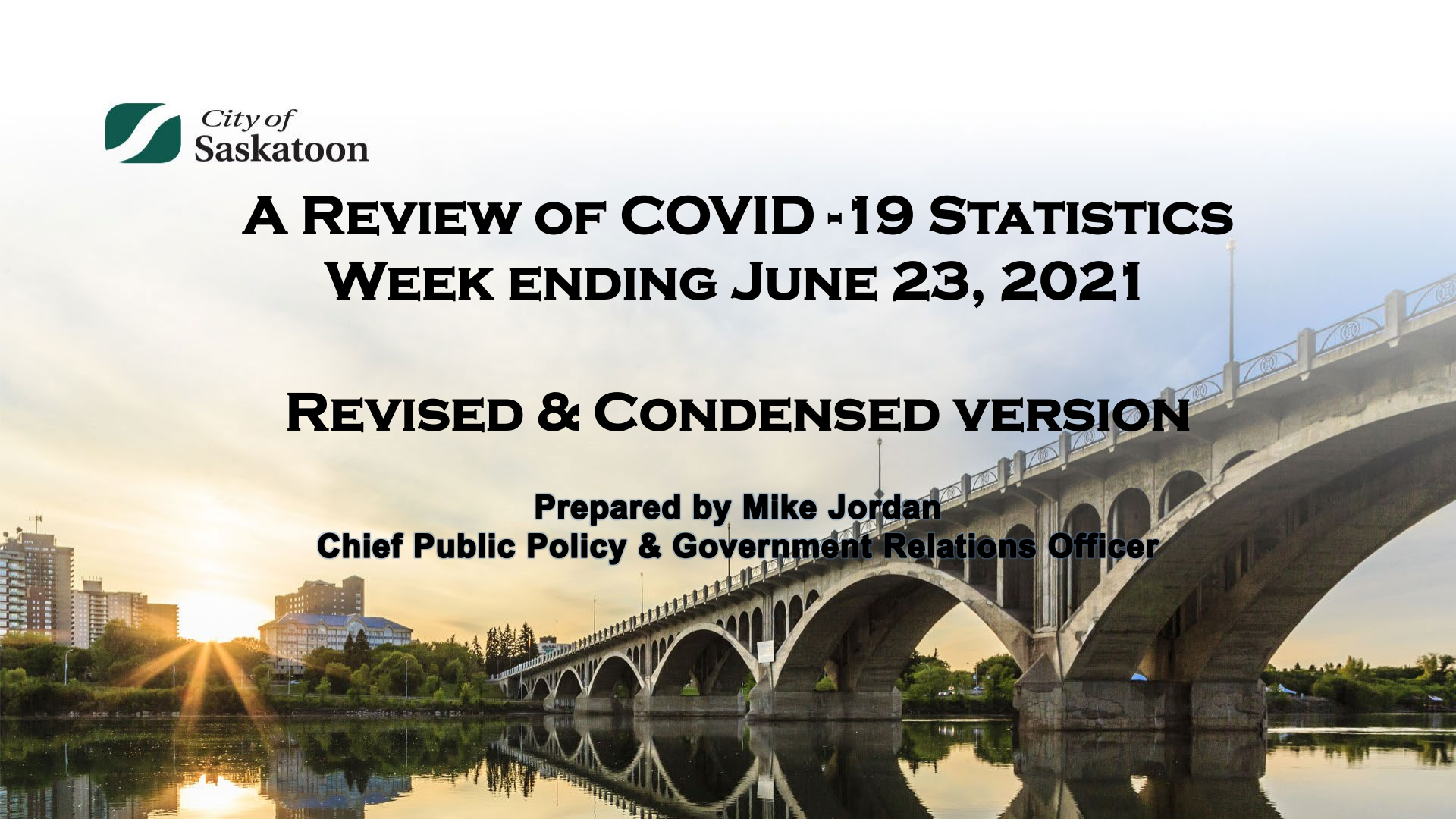
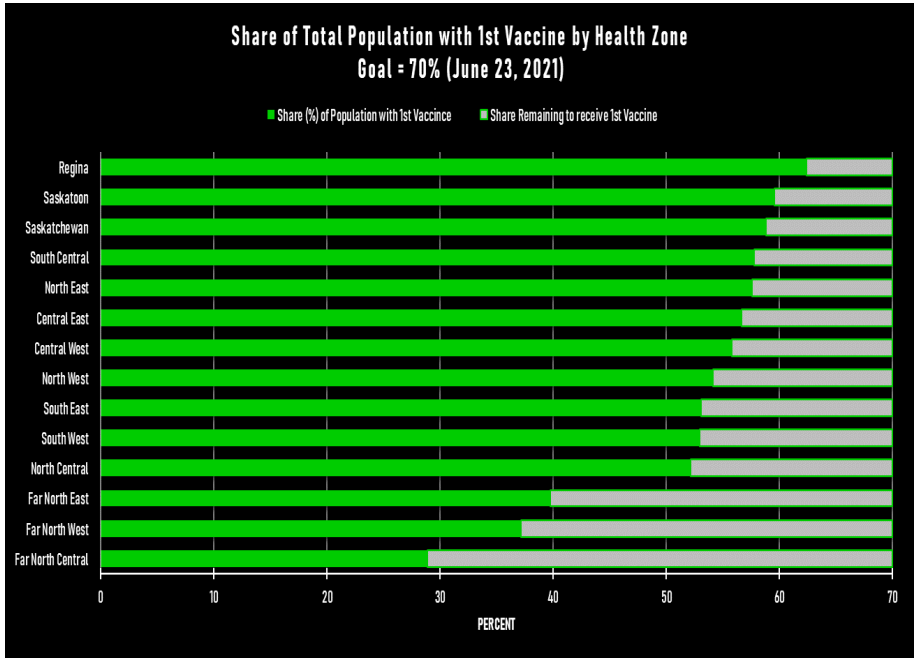


I have reordered the tables to start with the weekly cases, variants of concern (VOC), and Vaccines by each zone. Note that the VOC names have been changed to follow new labelling protocols. The "unknown variant cases" column means that testing has not confirmed the type of variant, only that the case is a VOC. The far-right columns show the progress to date on **vaccinations** by zone. A new column is added to show the share of persons fully vaccinated. The percentages are based on total population from Saskatchewan Health statistics. Vaccine data is graphed on next slide. National vaccine comparisons are later in this package.

Table A: Saskatchewan COVID-19 Data by Health Zone - Weekly Cases, Variants of Concern, and Vaccines (June 23, 2021)
Source: Author Calculations from https://dashboard.saskatchewan.ca/health-wellness

Location	Weekly Cases		Variants of Concern					Vaccines Administered				
Zone	Count	Per 100,000	B1.1.7 (Alpha)	B1.351 (Beta)	P.1 (Gamma)	B.1.617 (Delta)	Unknown Lineages	1st Dose	Fully Vaccinated	Total Doses	Share (%) of Population With 1st Vaccine	Share (%) of Population Fully
Far North West	18	60	164	0	9	0	126	11,086	6,008	17,094	37.1	20.1
Far North Central	0	0	1	0	0	0	0	769	493	1,262	28.9	18.5
Far North East	8	33	44	0	0	3	36	9,608	4,808	14,416	39.7	19.9
North West	41	49	249	0	**182**	2	349	45,531	19,554	65,085	54.1	23.2
North Central	44	49	274	**9**	14	2	319	46,847	22,742	69,589	52.2	25.3
North East	10	24	53	0	1	2	23	24,330	11,901	36,231	57.6	28.2
Saskatoon	**101**	**30**	**943**	**1**	**54**	**25**	**1,066**	**199,310**	**76,006**	**275,316**	**59.5**	**22.7**
Central West	23	**61**	83	0	1	7	54	21,036	10,123	31,159	55.8	26.9
Central East	18	18	382	0	1	2	254	56,609	26,571	83,180	56.6	26.6
Regina	89	33	**2,752**	0	1	**73**	**1,956**	170,426	75,316	245,742	**62.4**	27.6
South West	4	10	235	0	25	0	139	20,934	9,860	30,794	52.9	24.9
South Central	21	34	611	0	2	1	273	35,697	16,486	52,183	57.7	26.7
South East	24	26	656	0	1	2	474	48,333	24,305	72,638	53.1	26.7
Unassigned	11	N/A	29	0	1	1	47	21,219	7,790	29,009	N/A	N/A
Total Saskatchewan	**412**	**33**	**6,476**	**10**	**292**	**120**	**5,116**	**711,735**	**311,963**	**1,023,698**	**58.8**	**25.8**

Vaccine Progress. This slide shows vaccination administration in Saskatchewan. It builds off the data in the previous table and shows vaccine progress by zone and age cohort. The chart on the left shows the percent of the population in each zone that has received at least one vaccination (the green). It suggests that 70% vaccination of the population is the goal to reach immunity. The chart on the right is revised and shows the percentage of persons in each age cohort with at least both vaccines, aligning with Saskatchewan's re-open targets. The white bar represents the percent share of persons fully vaccinated. I have added the categories of over 40, over 30, over 18 and over 12 to show the percent of population with 1st dose. The 12 & over target is almost achieved.



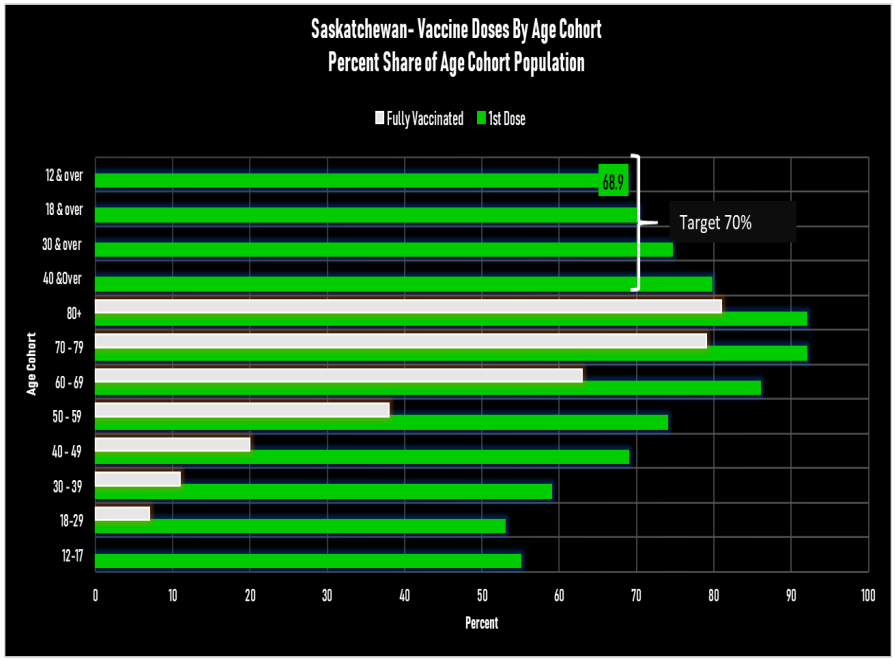


Table B shows various COVID statistics by Saskatchewan Health Zones. The table shows both case counts (the raw numbers as reported) and rates adjusted for 100,000 population in each zone. It also shows testing data, with rates adjusted to 100,000 persons. The reason for the adjustments is to show per capita comparisons on the various indicators. The following slides expand on this data and conduct trend analysis on some of the indicators. A row called "unassigned" means that some cases/tests have not been assigned a location.

Table B: Saskatchewan COVID-19 Data by Health Zone (Cumulative as of June 23, 2021)
Source: Author Calculations from https://dashboard.saskatchewan.ca/health-wellness

Location	Demographics		Cases				Hospitalizations		Recoveries	Fatalities		Tests		
Zone	Population Estimates (2020)	Share of Population (%)	Total Cases	Total Case Rate*	Active Cases	Active Case Rate*	Inpatient	ICU	Recovered	Deaths	Death Rate*	Total Tests	Test Rate*	Test Positivity Rate (%)
Far North West	29,866	2.5	2,614	8,752.4	32	107.1	1	0	2,552	30	100.4	22,921	76,746	11.4
Far North Central	2,662	0.2	358	13,448.5	0	0.0	0	0	355	3	112.7	2,044	76,784	17.5
Far North East	24,195	2.0	2,218	9,167.2	14	57.9	0	0	2,186	18	74.4	18,752	77,504	11.8
North West	84,130	6.9	4,643	5,518.8	58	68.9	7	1	4,508	77	91.5	47,776	56,788	9.7
North Central	89,824	7.4	4,468	4,974.2	54	60.1	9	2	4,357	57	63.5	61,105	68,027	7.3
North East	42,260	3.5	1,598	3,781.4	15	35.5	0	0	1,571	12	28.4	24,711	58,474	6.5
Saskatoon	**334,757**	**27.6**	**11,523**	**3,442.2**	**152**	**45.4**	**29**	**4**	**11,256**	**115**	**34.4**	**243,398**	**72,709**	**4.7**
Central West	37,696	3.1	814	2,159.4	33	87.5	0	0	775	6	15.9	17,094	45,347	4.8
Central East	99,982	8.3	2,393	2,393.4	29	29.0	3	0	2,345	19	19.0	56,715	56,725	4.2
Regina	273,287	22.6	12,010	4,394.6	150	54.9	11	5	11,709	151	55.3	194,794	71,278	6.2
South West	39,541	3.3	1,117	2,824.9	7	17.7	0	0	1,104	6	15.2	19,248	48,679	5.8
South Central	61,833	5.1	1,905	3,080.9	26	42.0	3	0	1,856	23	37.2	43,279	69,993	4.4
South East	91,100	7.5	2,721	2,986.8	30	32.9	0	0	2,643	48	52.7	51,309	56,322	5.3
Unassigned (Pending)	0	0.0	155	0.0	7	0.0	0	0	148	0	0.0	102,721	0	0.0
Total Saskatchewan	**1,211,133**	**100.0**	**48,537**	**4,007.6**	**607**	**50.1**	**63**	**12**	**47,365**	**565**	**46.7**	**905,867**	**74,795**	**5.4**

* indicates rates are per 100,000 persons

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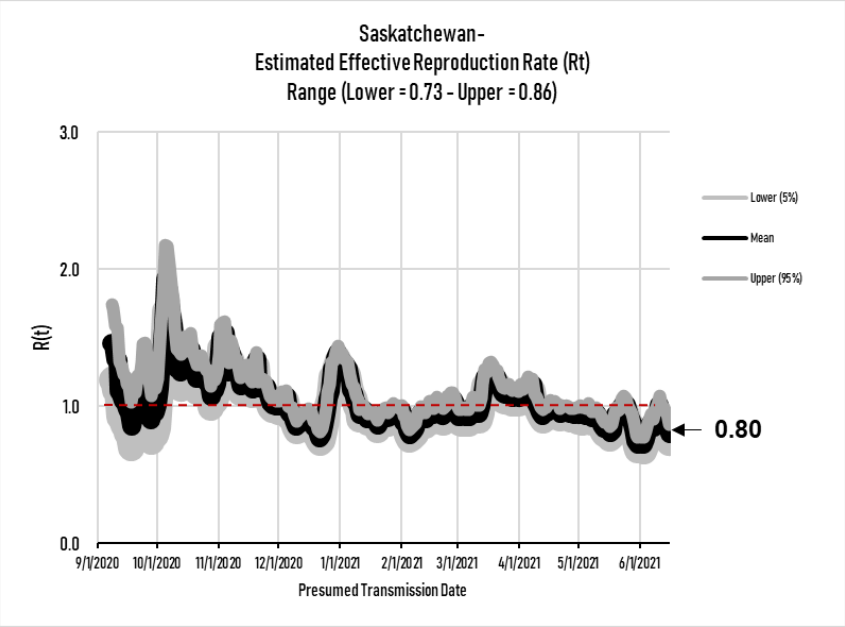
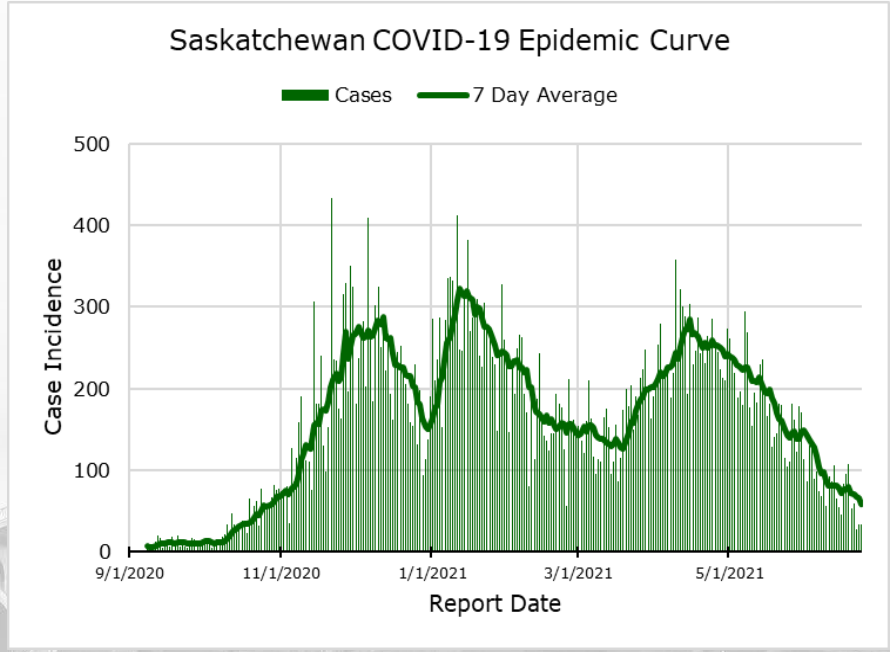
Given the data in the previous slide, this slide estimates the Effective Reproduction Number (Rt) for Saskatchewan (line chart). A few points to note here. (1) The dates are lagged because Rt uses recent case history to estimate the infection rate that caused them, referred to as the "presumed transmission date". This date occurs about 7 days prior to reporting of new cases. (2) An Rt above 1 means that COVID-19 is growing exponentially. An Rt below 1 means that cases will eventually die out. (3) Rt is based on the SEIR epidemiological model with assumptions. I use the Cori, et.al method to determine the Rt (described here: https://doi.org/10.1093/aje/kwt133). (4) The Rt is estimated as the mean using 95% confidence intervals. The lower and upper bound estimates in the chart reflect the confidence intervals. The epidemic curve to the right shows the case incidence.





This chart means that on June 16, 2021, one person infected with COVID-19 infected an estimated average of 0.80 additional persons. In other words, 100 primary infections, generated an estimated 80 secondary infections. This level means transmission is under control.

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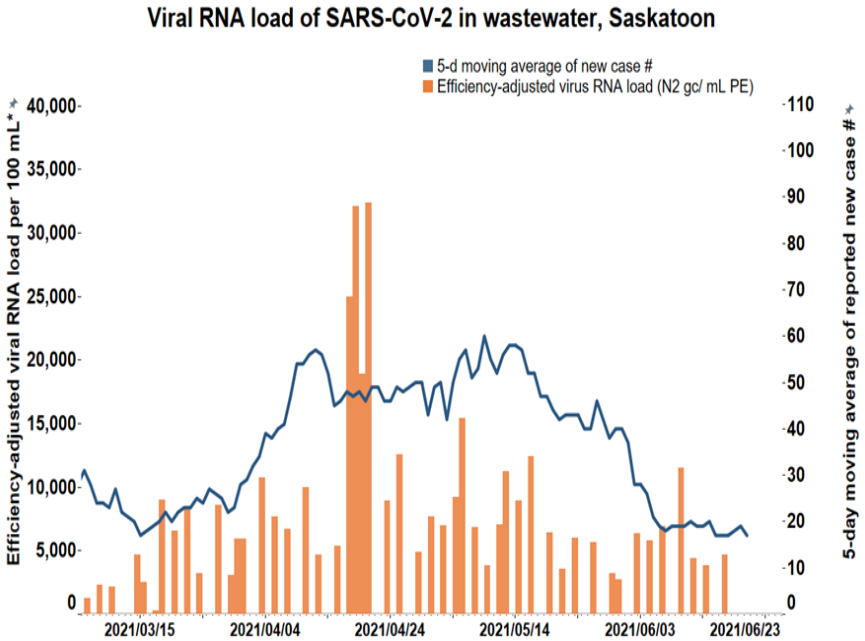
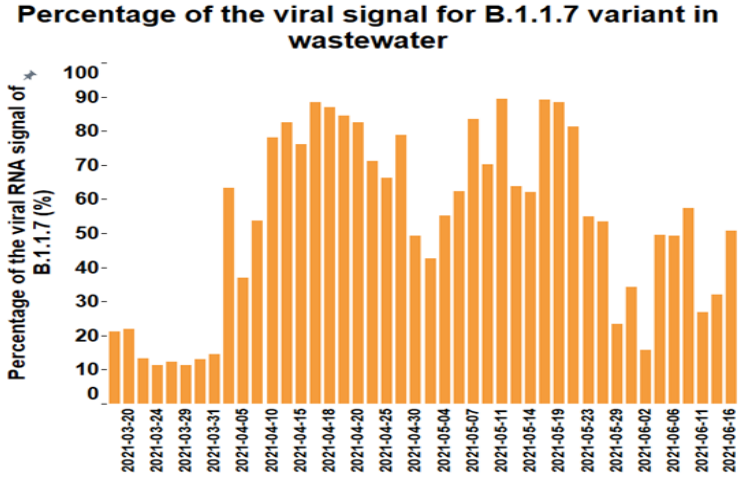
Wastewater Testing: The charts on this slide show the wastewater samples collected in Saskatoon. This is a predictive model that tests wastewater samples to determine the concentration of SARS-COV-2 and its variants. The chart on the left shows the wastewater test sample against the 5-day rolling average of new reported cases (blue line). The sample is showing a 46% week over week decrease in concentrations and thus a declining case trend in 10-14 days. The samples are a leading indicator of the emergence of the COVID-19 virus. The chart on the right shows the percentage of samples that contain the B.1.1.7 variant of concern. Recent sample tests show a 30% week-over-week decrease in viral load of the VOC. Source: https://water.usask.ca/covid-19/

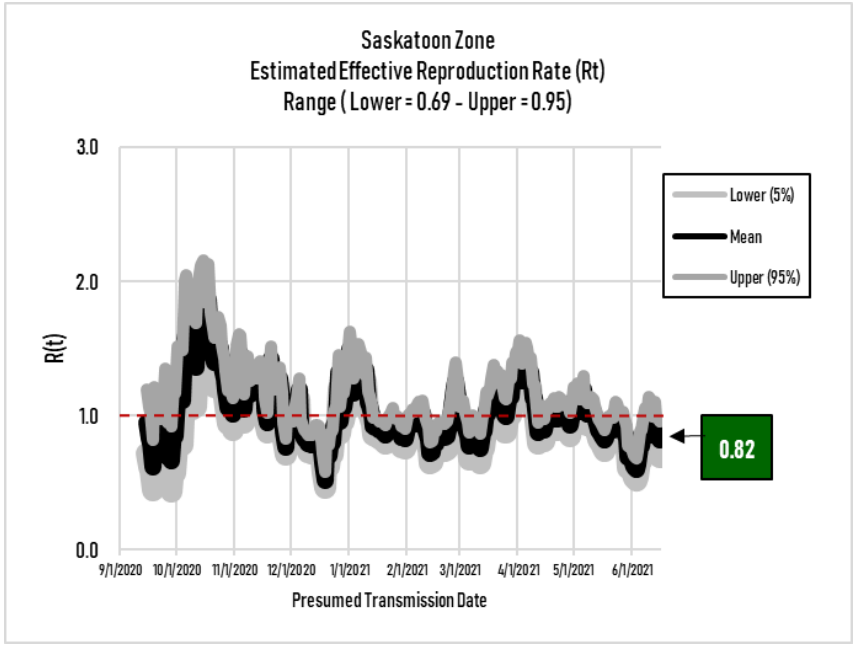




D3L mutation of Nucleocapsid Protein (N_D3L) suggests the viral RNA signal coming from B.1.1.7 based on the current database (GISAID, 2021-03-31). N_D3L mutation is detected by RT-qPCR assasys for screening targeted COVID-19 variants of concern (VOCs). Supported by PHAC and NML, VOCs are validated by next-generation sequencing afterwards.

Reference: Tyson E. Graber et al., An allele-specific primer extension assay to quantify the proportion of B.1.1.7-specific SARS-CoV-2 RNA in wastewater. MedRxiv, 10.1101/2021.02.22.21252041.

Saskatoon Metrics: In August, Saskatoon City Council adopted various statistical measures to monitor the spread of COVID-19 in the Saskatoon Zone. The measures are: (1) the effective reproduction rate (Rt)-see previous slide for an explanation; (2) Weekly Cases/100,000; and (3) the weekly test positivity rate. The Rt is estimated at 0.82. Weekly cases/100,000 are yellow as they are less than 50 cases per 100,000 persons, at 30. The test positivity rate is at its lowest several in the last 10 months at 1.7% for the weekly average.

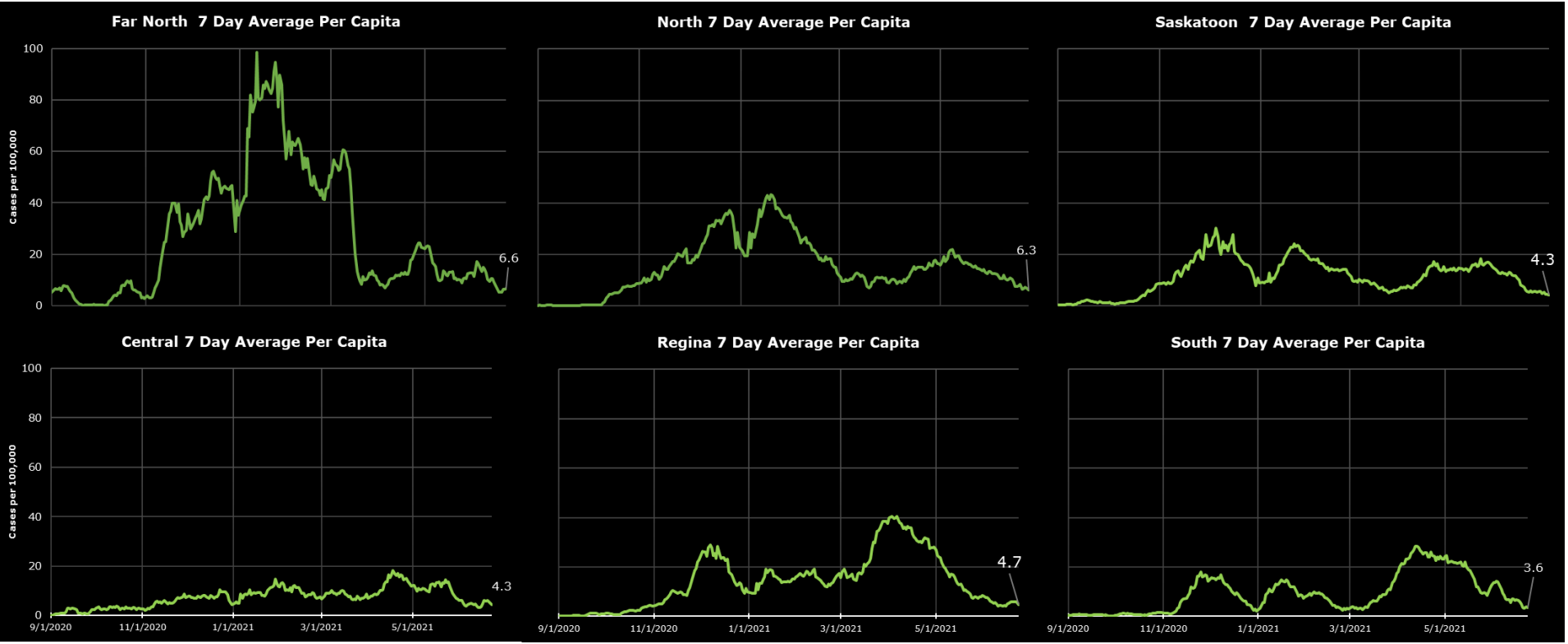


This chart means that on June 16, 2021, one person infected with COVID-19 infected an estimated average of 0.82 additional persons. In other words, 100 primary infections, generated 82 secondary infections. This level means the virus spread is under control.

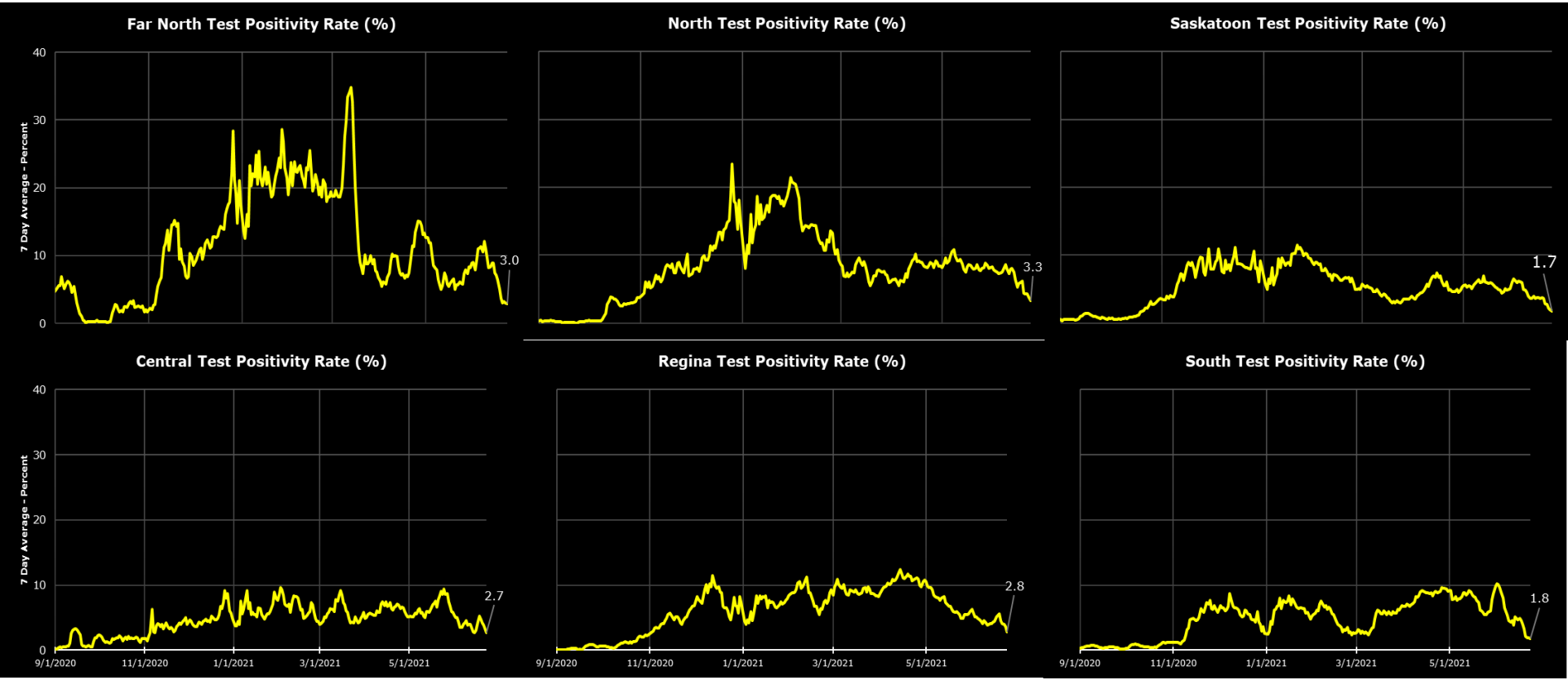
Saskatoon Zone Indicators (weekly cases/ 100,000 & test positivity rate)		
Week Ending	Weekly cases/100,000 persons	Test Positivity Rate % (7 day Average)
2/7/2021	95	6.6
2/14/2021	100	7.0
2/21/2021	68	5.1
2/28/2021	55	4.2
3/10/2021	64	4.9
3/17/2021	43	3.6
3/24/2021	43	3.0
3/31/2021	53	4.0
4/7/2021	73	4.7
4/14/2021	110	6.7
4/21/2021	105	6.0
4/28/2021	95	4.5
5/5/2021	100	5.3
5/12/2021	110	6.1
5/19/2021	114	5.6
5/26/2021	93	5.1
6/2/2021	82	5.9
6/9/2021	44	4.0
6/16/2021	39	4.9
6/23/2021	30	1.7

Legend:	
Weeky Cases/100,000	Test Positivity Rate
Less than 20	Less than 2.0%
Between 21 and 50	Between 2.0% and 5.0%
Greater than 50	Greater than 5%

CASE COUNTS PER CAPITA: This slide shows panel charts using the 7 day average of cases adjusted for 100,000 population. It uses the same y-axis scale so that better comparisons about the COVID-19 impact on each aggregate zone can be made. Note that only the first two charts on each row have the y-axis labelled and the same scale is used on each chart. The charts are ordered in the same way as the previous tables. All zones have a single digit per capita case rate, a rate similar to that in September 2020.

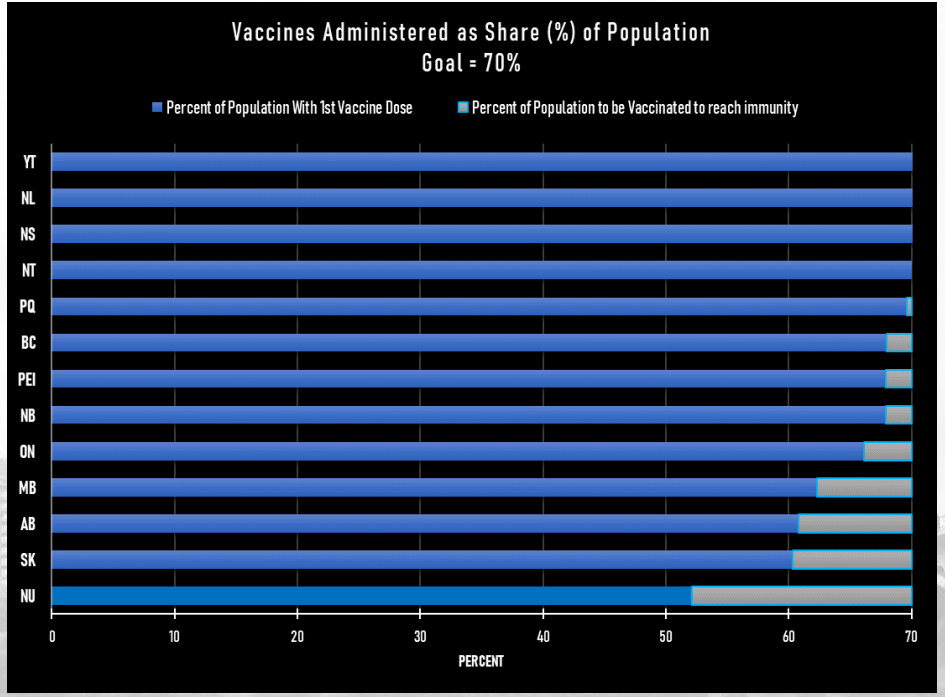


TEST POSITIVITY RATES: This slide shows the 7-Day moving average of Test Positivity Rates by each aggregate zone. Again, that is the 7-day average of the number of positive cases relative to the 7 day average for the number of persons tested by reported by each aggregate zone. The y-axis is scaled the same for each zone so that better comparisons can be made. The highest rate is now in North Zone at 3.3%. All other zones are at or below 3%.



NATIONAL OVERVIEW

VACCINES- (revised slide). This slide shows the number of vaccines administered by each jurisdiction in a couple of ways. The bar chart on the left shows the percent of population who have at the 1st vaccine dose (the blue bar). To be consistent with Saskatchewan's target, the goal is 70% vaccination, so the grey bar represents the gap to go. As the chart shows, four jurisdictions have reached the target, with Quebec on the cusp. Next to Nunavut, Saskatchewan has the lowest 1st dose vaccination rate . In terms of persons fully vaccinated, the map chart shows the territories are leading the way with at least 40% fully vaccinated in each territory, while Alberta leads the provinces at 27.1%, with Saskatchewan close behind.



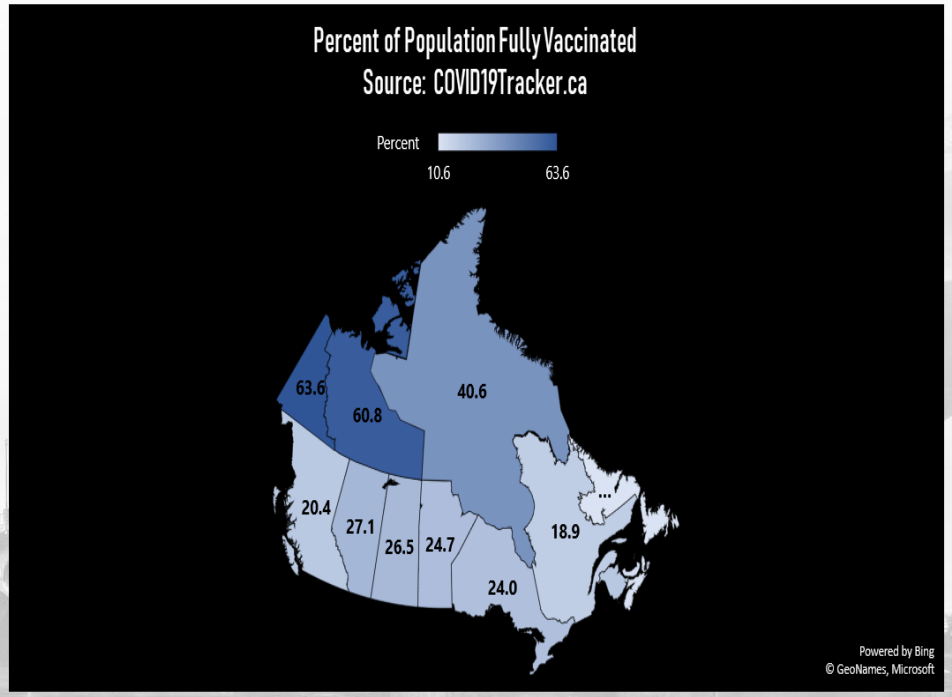


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Table C shows various COVID-19 characteristics for all provinces in Canada. The table groups demographic, case, and testing data in their own columns. The table is constructed similar to Table A at the beginning of the deck in that it uses counts and rates. A couple of points: (1) Saskatchewan's population differs in this table relative to Table A, as this table relies on Statistics Canada population counts; (2) testing numbers for Saskatchewan will differ from those listed in Tables A, due to different test reporting requirements at the Public Health Agency of Canada.

Table C: Areas in Canada with Cases of COVID-19 (Cumulative as of June 23, 2021)
Source: https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html

	Population		Total Cases		Active cases		Recoveries	Deaths		Tests		
Case Location	Count	Share (%)	Count	Rate*	Count	Rate*	Count	Count	Rate*	Count	Rate**	Test Positivity Rate (%)
British Columbia	5,145,851	13.5	147,271	2,862	1,144	22	144,383	1,744	34	2,851,459	450,138	5.2
Alberta	4,428,112	11.7	231,568	5,229	1,676	38	227,600	2,292	52	4,636,175	873,694	5.0
Saskatchewan	1,177,884	3.1	48,537	4,121	607	52	47,365	565	48	900,949	601,553	5.4
Manitoba	1,379,584	3.6	55,589	4,029	1,789	130	52,668	1,132	82	855,971	447,742	6.5
Ontario	14,733,119	38.8	543,019	3,686	3,032	21	530,894	9,093	62	15,606,604	888,239	3.5
Quebec	8,575,779	22.6	374,222	4,364	1,184	14	361,840	11,198	131	9,688,894	890,856	3.9
Newfoundland and Labrador	520,998	1.4	1,384	266	17	3	1,360	7	1	296,511	438,661	0.5
New Brunswick	781,315	2.1	2,320	297	44	6	2,231	45	6	370,126	356,356	0.6
Nova Scotia	979,115	2.6	5,793	592	60	6	5,641	92	9	914,063	464,563	0.6
Prince Edward Island	159,713	0.4	206	129	0	0	206	0	0	172,743	827,546	0.1
Yukon	42,176	0.1	220	522	92	218	125	3	7	9,129	207,029	2.4
Northwest Territories	45,074	0.1	128	284	0	0	128	0	0	24,548	370,541	0.5
Nunavut	39,285	0.1	657	1,672	0	0	653	4	10	17,497	255,559	3.8
Repatriated travellers	N/A	N/A	13	N/A	0	N/A	13	0	N/A	76	N/A	17.1
Canada	**38,008,005**	**100**	**1,410,927**	**3,712**	**9,645**	**25**	**1,375,107**	**26,175**	**69**	**36,344,745**	**956,239**	**3.9**

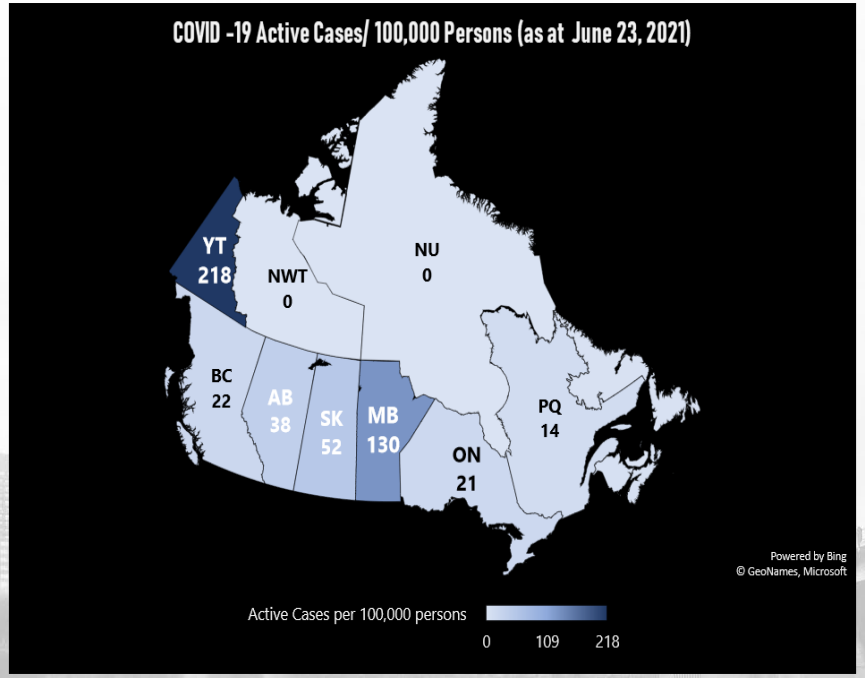
Notes:

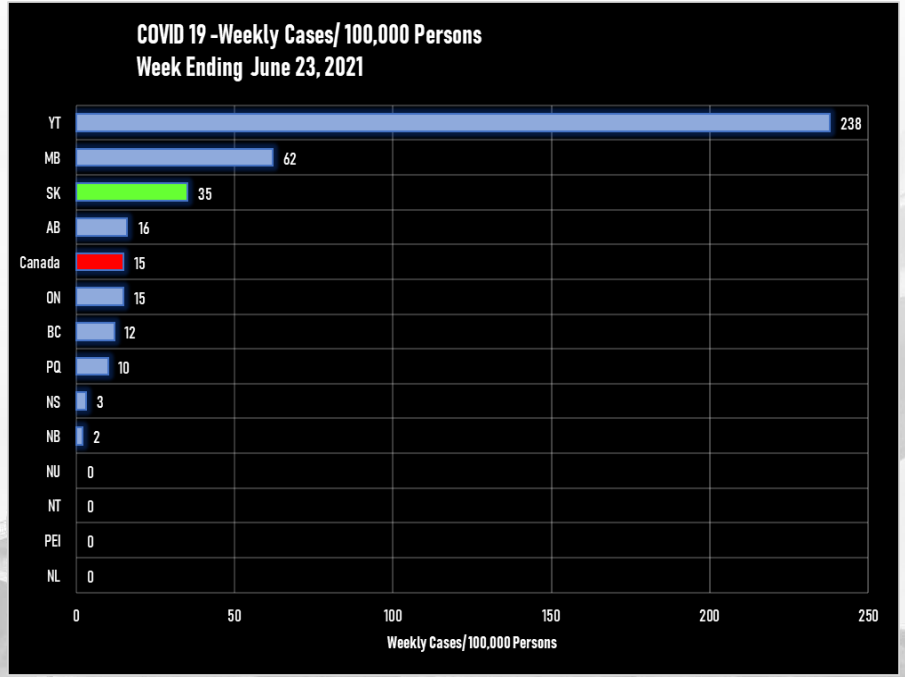
 # as of Q4, 2020, from Statistics Canada Table 17-10-0009-01

Rate = per 100,000 populaiton*

*Rate** = per 1,000,000 population*

This slide adjusts two data sets for population. The map chart shows active COVID-19 cases by province and territory per 100,000 persons. The colour gradient illustrates the case intensity. Ironically, Yukon has the highest active case rate and the highest vaccination rate. According to Yukon health, the surge in cases is from the P1 or Gamma VOC infections in unvaccinated persons (https://yukon.ca/en/news/june-21-2021-new-covid-19-cases-confirmed-community-transmission-among-unvaccinated). The second chart show the change in weekly cases/ per 100,000 persons. Yukon has a weekly almost four times higher than the next highest jurisdiction. (Note Saskatchewan's number differs from earlier slides due to population count differences between Saskatchewan Health and Statistics Canada).





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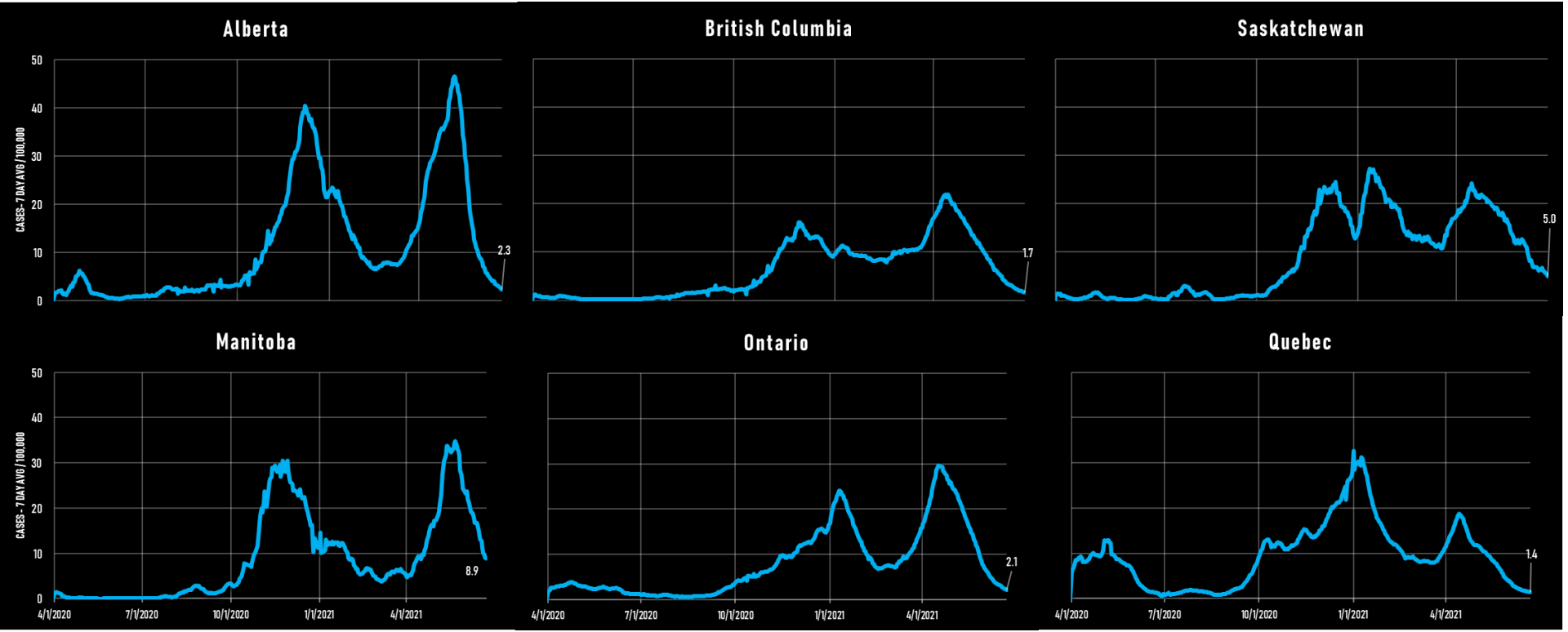
CASES PER CAPITA: This slide compares case data on a per capita basis, since April 1, 2020, to show the case patterns over the past 14 months. The case data is scaled by cases/per 100,000 population. It uses the 7-day average of cases adjusted for 100,000 population. It uses the same y-axis scale so that better comparisons about the COVID-19 impact be made for each province. Note that only the first two charts on each row have the y-axis labelled and the same scale is used on each chart. All provinces except Manitoba have a case rate of 5.0 or less.

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QUESTIONS, COMMENTS OR SUGGESTIONS?
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