



A REVIEW OF COVID-19 STATISTICS WEEK ENDING APRIL 14, 2021

VERSION 3.1

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Table A 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 will 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 A: Saskatchewan COVID-19 Data by Health Zone (Cumulative as of April 14, 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	2,207	7,389.7	48	160.7	1	0	2,131	28	93.8	19,219	64,351	11.5
Far North Central	2,662	0.2	353	13,260.7	1	37.6	0	0	349	3	112.7	1,828	68,670	19.3
Far North East	24,195	2.0	2,011	8,311.6	11	45.5	1	0	1,987	13	53.7	16,461	68,035	12.2
North West	84,130	6.9	3,494	4,153.1	164	194.9	2	0	3,280	50	59.4	37,477	44,547	9.3
North Central	89,824	7.4	3,586	3,992.3	60	66.8	9	1	3,477	49	54.6	49,735	55,369	7.2
North East	42,260	3.5	1,382	3,270.2	34	80.5	1	0	1,337	11	26.0	20,707	48,999	6.7
Saskatoon	334,757	27.6	8,728	2,607.3	485	144.9	43	8	8,150	93	27.8	189,609	56,641	4.6
Central West	37,696	3.1	611	1,620.9	29	76.9	0	0	577	5	13.3	14,000	37,139	4.4
Central East	99,982	8.3	1,655	1,655.3	145	145.0	10	2	1,497	13	13.0	44,294	44,302	3.7
Regina	273,287	22.6	9,228	3,376.7	973	356.0	79	27	8,121	134	49.0	160,644	58,782	5.7
South West	39,541	3.3	725	1,833.5	64	161.9	3	1	657	4	10.1	14,489	36,643	5.0
South Central	61,833	5.1	1,218	1,969.8	159	257.1	2	2	1,044	15	24.3	32,272	52,192	3.8
South East	91,100	7.5	1,762	1,934.1	281	308.5	11	0	1,441	40	43.9	40,488	44,443	4.4
Unassigned (Pending)	0	0.0	125	0.0	71	0.0	0	0	54	0	0.0	72,690	0	0.0
Total Saskatchewan	1,211,133	100.0	37,085	3,062.0	2,525	208.5	162	41	34,102	458	37.8	713,913	58,946	5.2

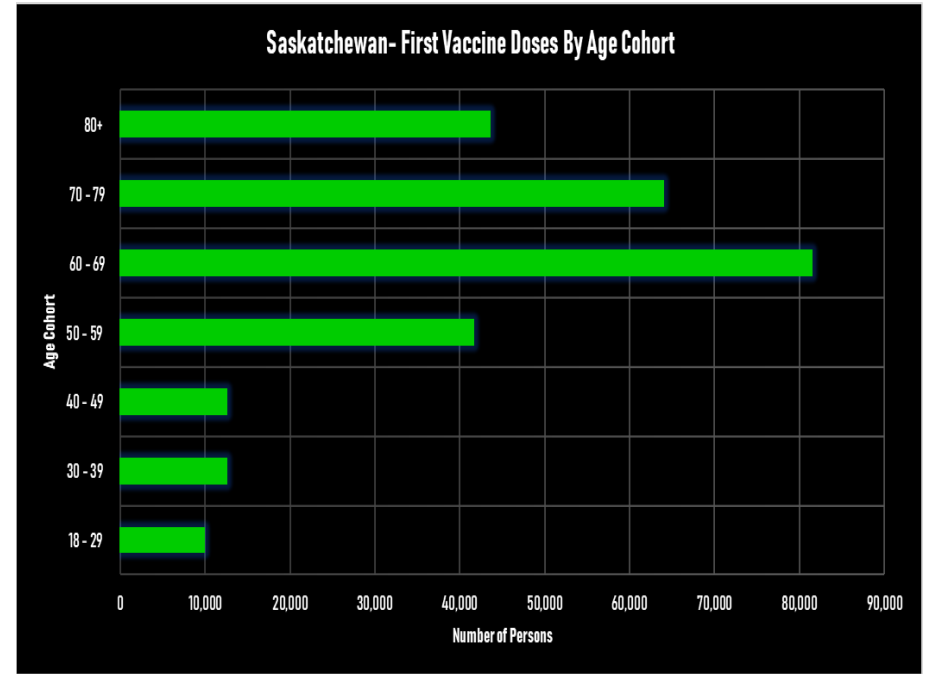
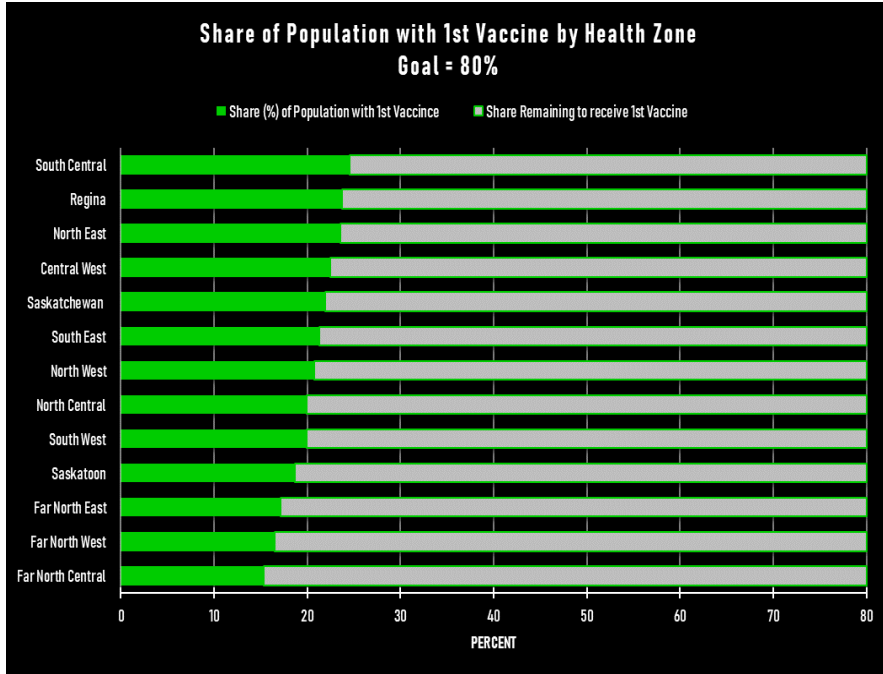
* indicates rates are per 100,000 persons

Table B adds complimentary statistics on the distribution of cases (percent shares) and weekly cases. I have added columns to illustrate the **Variants of Concern**, which are new mutations of the SARS COV-2, for each zone. About 83% of the variants are in the Regina zone. The "unknown variant cases" column means that testing has not confirmed the type of variant, only that the case is a result of a variant. The far-right columns show the progress to date on **vaccinations** by zone. National vaccine comparisons are later in this package.

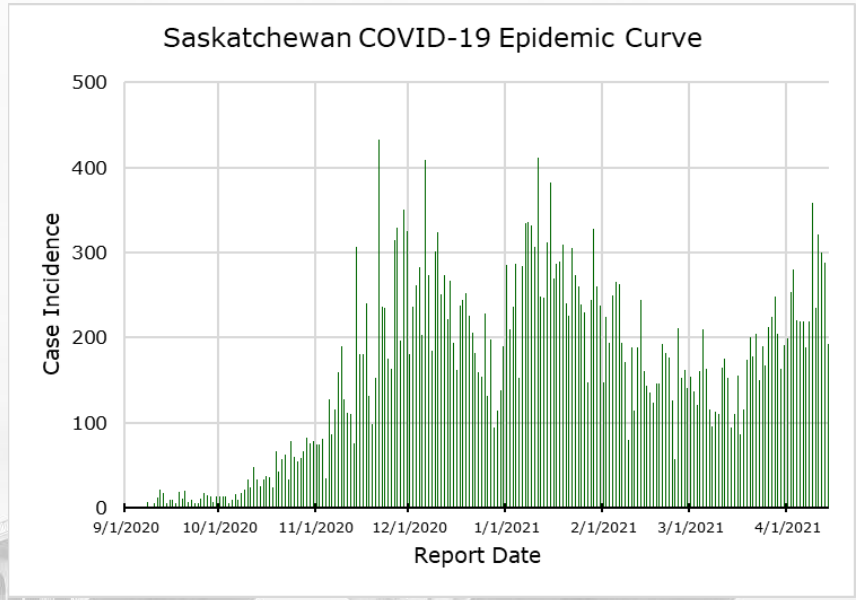
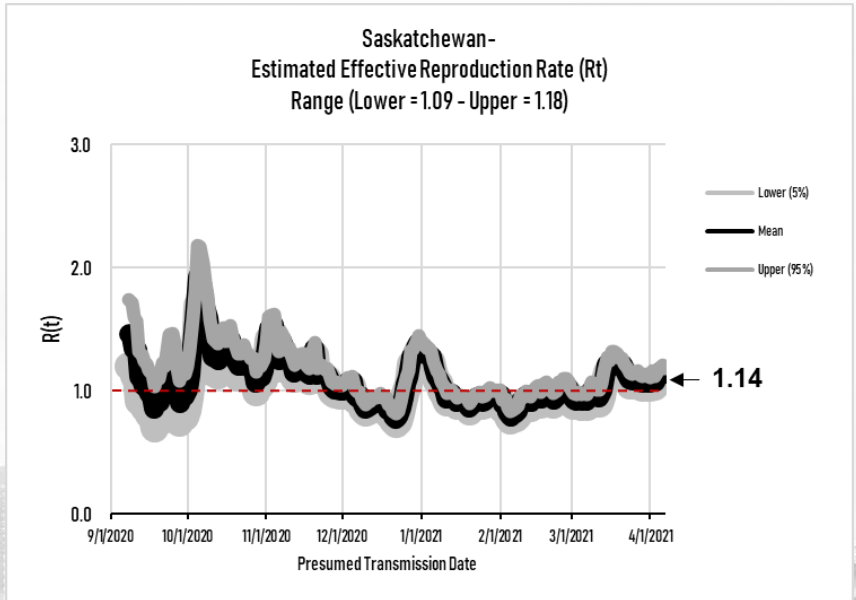
Table B: Saskatchewan COVID-19 Data by Health Zone - Weekly Cases and Vaccines
 Source: Author Calculations from <https://dashboard.saskatchewan.ca/health-wellness>

Location	Pecent Share (%)			Weekly Cases		Variants of Concern				Vaccines Administered			
Zone	Total Cases	Active Cases	Deaths	Count	Per 100,000	B1.1.7 (UK)	B1.351 (South Africa)	P.1 (Brazil)	Unknown Variant cases	1st Dose	2nd Dose	Total	Share (%) of Population With 1st Vaccine
Far North West	6.0	1.9	6.1	36	121	0	0	0	9	4,916	1,474	6,390	16.5
Far North Central	1.0	0.0	0.7	1	38	0	0	0	0	409	318	727	15.4
Far North East	5.4	0.4	2.8	11	45	0	0	0	2	4,143	1,176	5,319	17.1
North West	9.4	6.5	10.9	151	179	1	0	0	40	17,420	2,879	20,299	20.7
North Central	9.7	2.4	10.7	50	56	5	9	0	46	17,914	4,387	22,301	19.9
North East	3.7	1.3	2.4	28	66	0	0	0	3	9,961	1,486	11,447	23.6
Saskatoon	23.5	19.2	20.3	368	110	18	0	0	328	62,490	7,349	69,839	18.7
Central West	1.6	1.1	1.1	28	74	4	0	0	29	8,480	1,032	9,512	22.5
Central East	4.5	5.7	2.8	104	104	27	0	0	121	24,983	4,213	29,196	25.0
Regina	24.9	38.5	29.3	696	255	1,137	0	0	2,532	64,847	9,244	74,091	23.7
South West	2.0	2.5	0.9	59	149	9	0	0	48	7,879	721	8,600	19.9
South Central	3.3	6.3	3.3	110	178	132	0	0	333	15,172	1,740	16,912	24.5
South East	4.8	11.1	8.7	214	235	93	0	0	378	19,363	3,992	23,355	21.3
Unassigned	N/A	N/A	N/A	58	N/A	N/A	N/A	N/A	32	7,480	1,981	9,461	N/A
Total Saskatchewan	100	100	100	1,914	158	1,422	9	0	3,901	265,457	41,992	307,449	21.9

This slide shows vaccination administration in Saskatchewan. It builds off the data in the previous slide 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). We assume that 80% vaccination of the population is needed to reach immunity. As more second doses are administered a new chart will be added to show full vaccinations. The chart on the right shows the number of persons with at least one vaccine by age cohort.

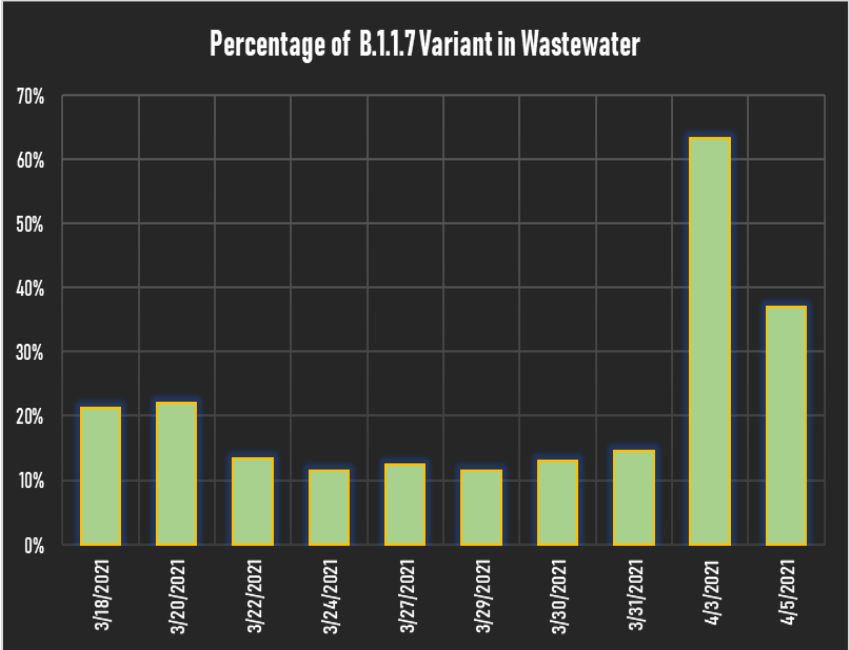
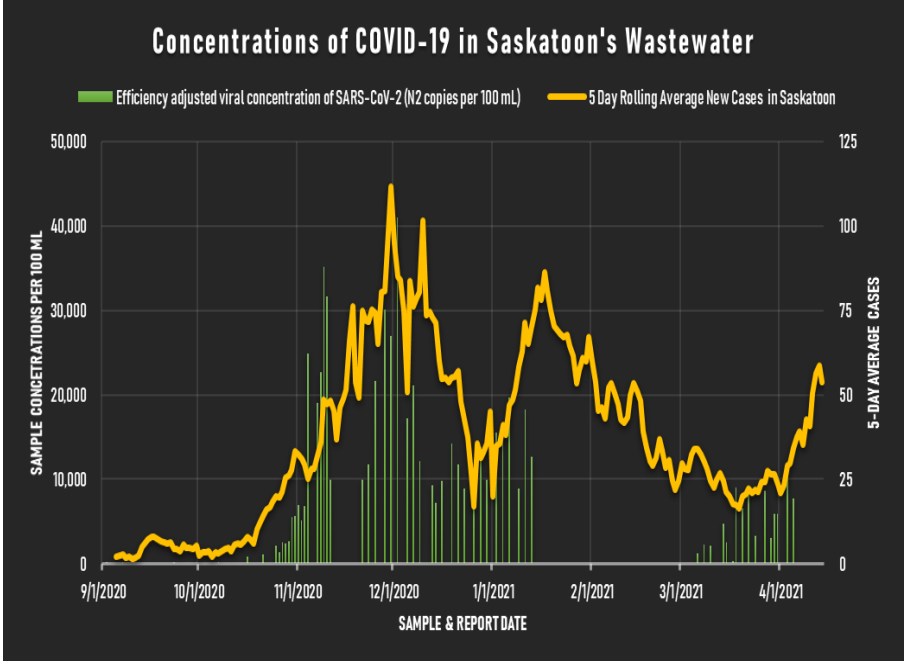


Given the data in the previous slides, this slide estimates the Effective Reproduction Number (Rt) for Saskatchewan (line chart). A few points to note here. (1) The dates are lagged because Rt uses recent case history to estimate the infection rate that caused them, referred to as the “presumed transmission 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.

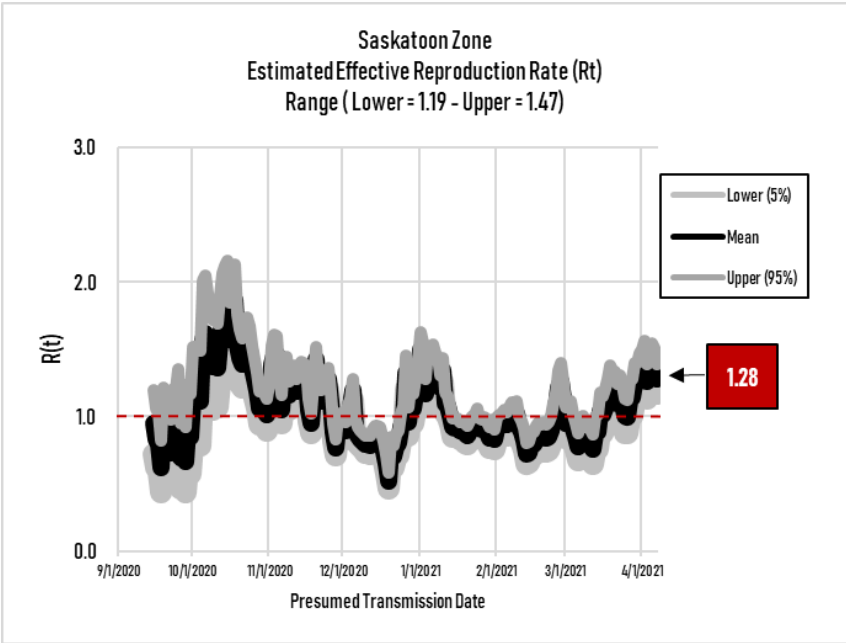


This chart means that on April 7, 2021 one person infected with COVID-19 infected an estimated average of 1.14 additional persons. In other words, 100 primary infections, generated an estimated 114 secondary infections

REVISED SASKATOON 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 (green bars) against the 5-day rolling average of new reported cases (yellow line). The samples are 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.



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 1.28. Weekly cases/100,000 remain red as they are greater than 50 cases per 100,000 persons, at 110. The test positivity rate has risen to 6.7% for the weekly average. These last two indicators are shown in the following slides.



This chart means that on April 7, 2021, one person infected with COVID-19 infected an estimated average of 1.28 additional persons. In other words, 100 primary infections generated 128 secondary infections

**Saskatoon Zone Indicators
(weekly cases/ 100,000 & test positivity rate)**

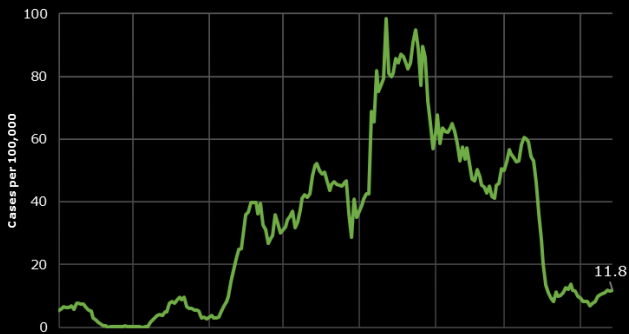
Week Ending	Weekly cases/100,000 persons	Test Positivity Rate % (7 day Average)
12/20/2020	114	7.6
12/27/2020	77	7.1
1/3/2021	64	7.1
1/9/2021	112	10.8
1/17/2021	183	9.8
1/24/2021	138	9.1
2/1/2021	119	8.4
2/7/2021	95	6.6
2/14/2021	100	7.0
2/21/2021	68	5.1
2/28/2021	55	4.2
3/10/2021	64	4.9
3/17/2021	43	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

Legend:

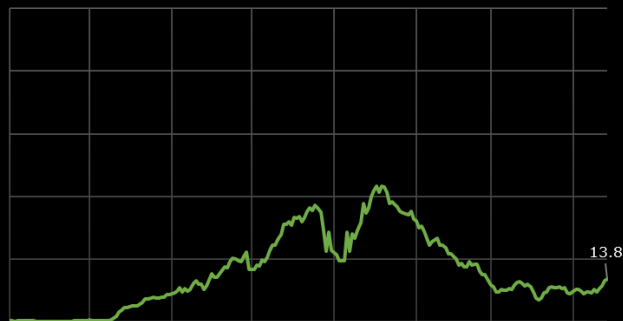
Weekly Cases/100,000	Test Positivity Rate
Less than 20	Less than 2.0%
Between 21 and 50	Between 2.0% and 5.0%
Greater than 50	Greater than 5%

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. Regina's case rate is still high at 36, with the South Zone a close second. By contrast, Saskatoon's rate is rising and is now at 15.6.

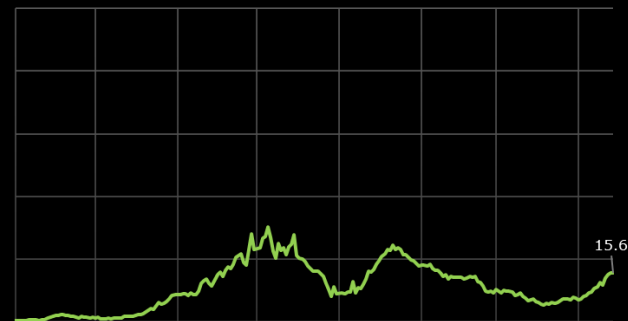
Far North 7 Day Average Per Capita



North 7 Day Average Per Capita



Saskatoon 7 Day Average Per Capita



Central 7 Day Average Per Capita



Regina 7 Day Average Per Capita

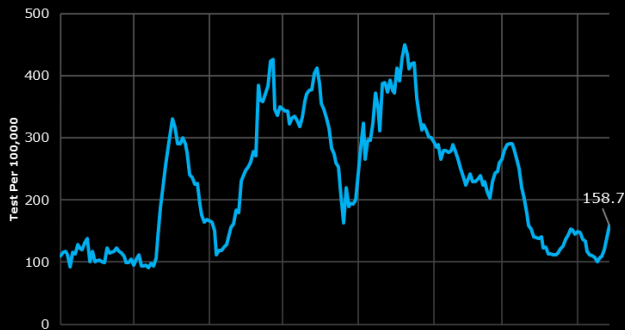


South 7 Day Average Per Capita

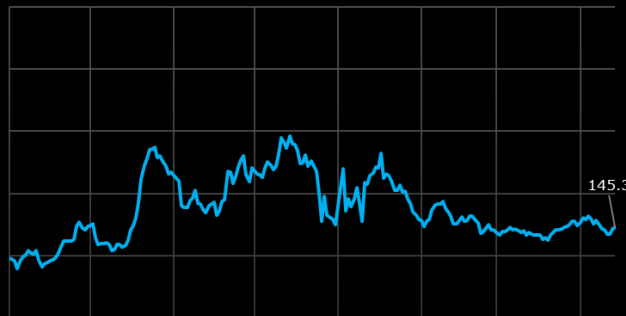


This slide shows testing rates using a 7-day average adjusted for 100,000 population, from September 1, 2020. Previous versions did not scale for population. This revision aims to better show comparisons between the aggregate zones. Like the case per capita comparisons, only the first two charts on each row have the y-axis labelled and the same scale is used on each chart. The highest per capita testing rates are now in the South zone Regina, averaging 309 tests per 100,000 persons every 7 days. Saskatoon sits at 234, with a noticeable rising trendline.

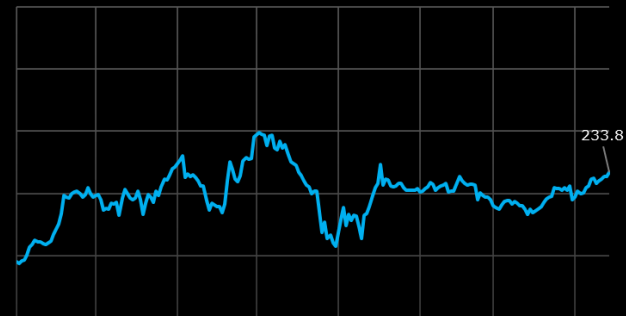
Far North 7- Day Average Per Capita



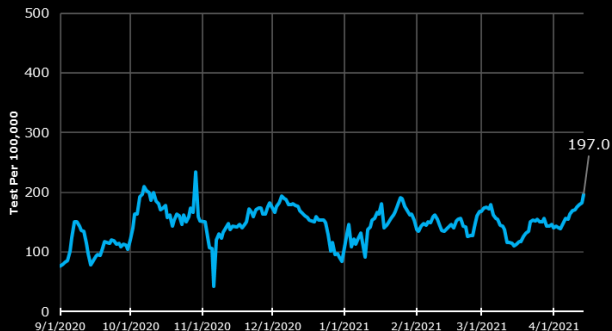
North 7- Day Average Per Capita



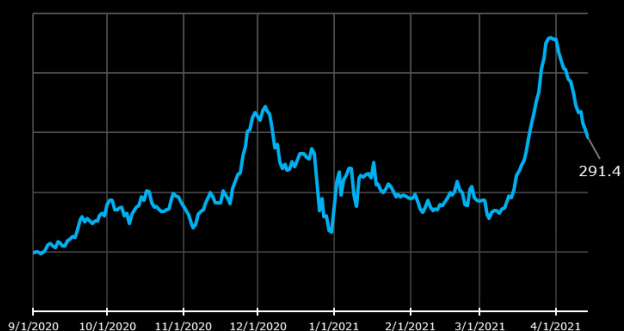
Saskatoon 7-Day Average Per Capita



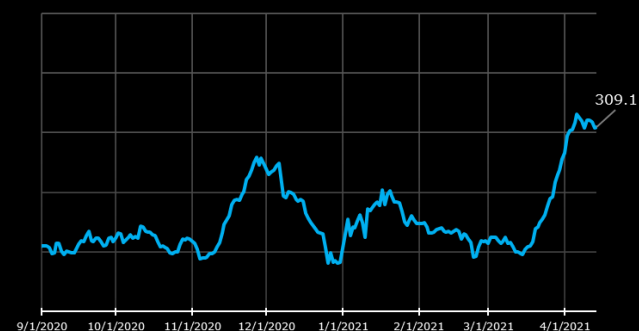
Central 7-Day Average Per Capita



Regina 7-Day Average Per Capita

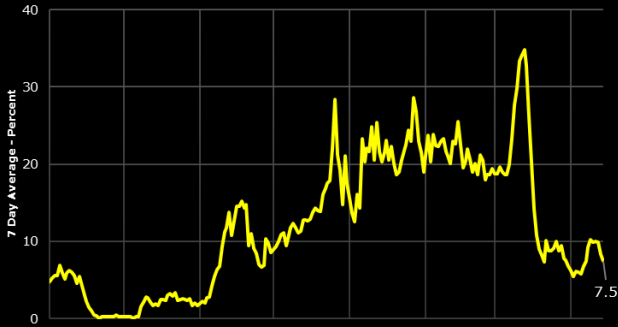


South 7-Day Average Per Capita

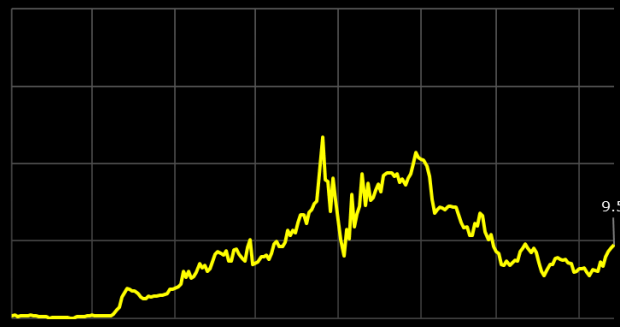


This slide shows the 7-Day moving average of Test Positivity Rates by each aggregate zone. Again, that is the 7-day average of the number of positive cases relative to the 7 day average for the number of persons tested by reported by each aggregate zone. The y-axis is scaled the same for each zone so that better comparisons can be made. The highest rate is in the Regina zone at 11.9%. Saskatoon continues to have the lowest rate at 6.7%, but the trend is rising.

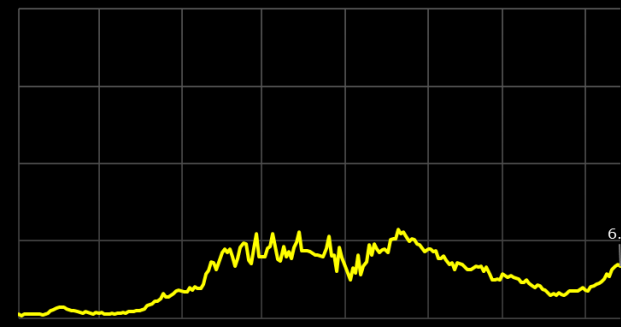
Far North Test Positivity Rate (%)



North Test Positivity Rate (%)



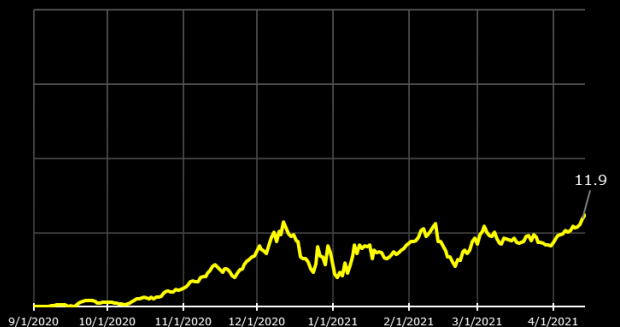
Saskatoon Test Positivity Rate (%)



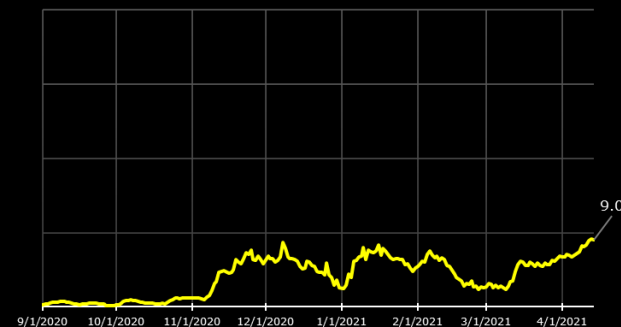
Central Test Positivity Rate (%)



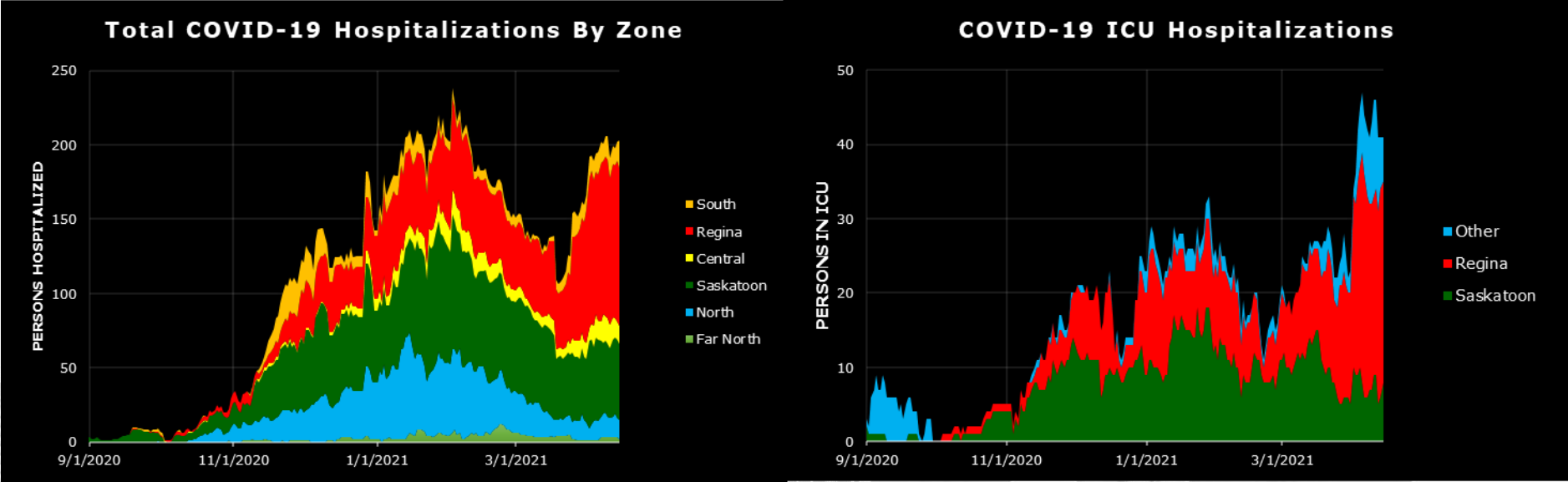
Regina Test Positivity Rate (%)



South Test Positivity Rate (%)

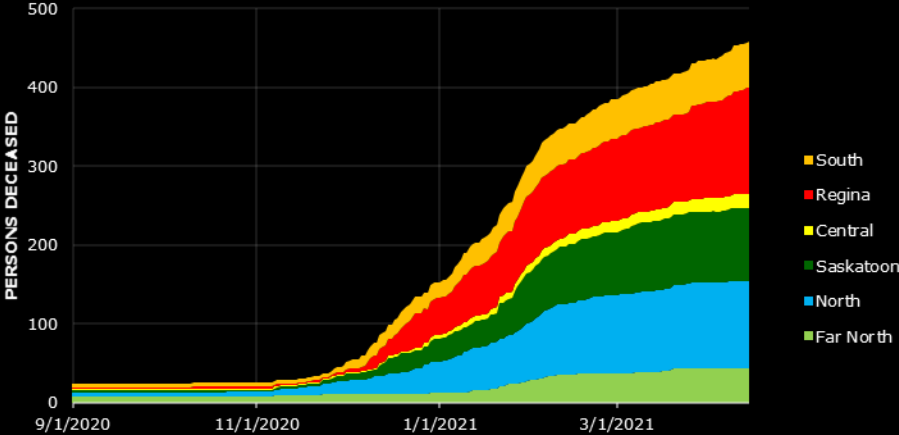


The charts on this slide show total hospitalizations, ICU hospitalizations by aggregate zone since September 1. Most hospitalizations are in the Regina zone (the red area). The chart on the right contains daily ICU hospitalizations for Saskatoon and Regina primarily (the blue area combines ICUs for all other zones). There are currently 41 ICU patients in Saskatchewan, with 27 in Regina. As the chart shows, Saskatchewan has established new peak ICUs in April.

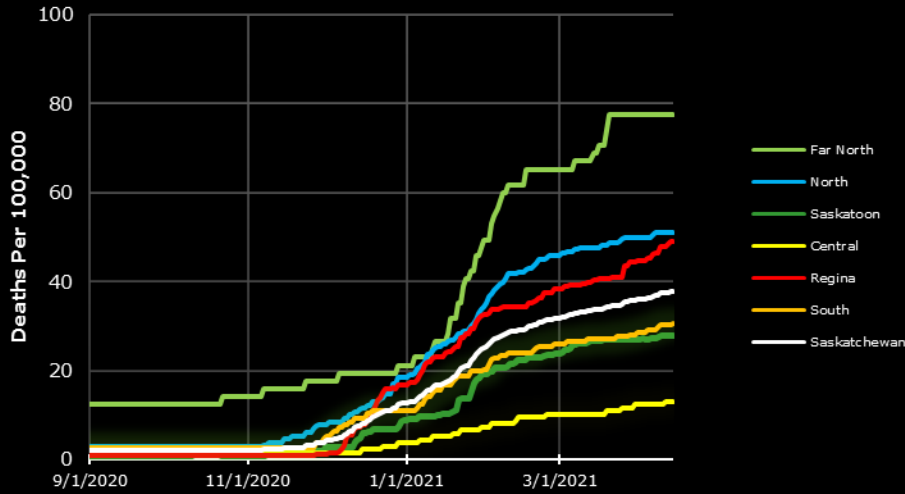


The charts on this slide show COVID fatalities by aggregate zone since September 1. The area chart on the left shows the deaths by aggregate zone. The line chart on the right converts the data to a per capita measure to illustrate the number of deaths per 100,000 persons. The Far North has the highest COVID fatality rate at 77.6 for every 100,000 persons, but this has flatlined over the past few weeks. There is a noticeable rise in Regina fatality trends.

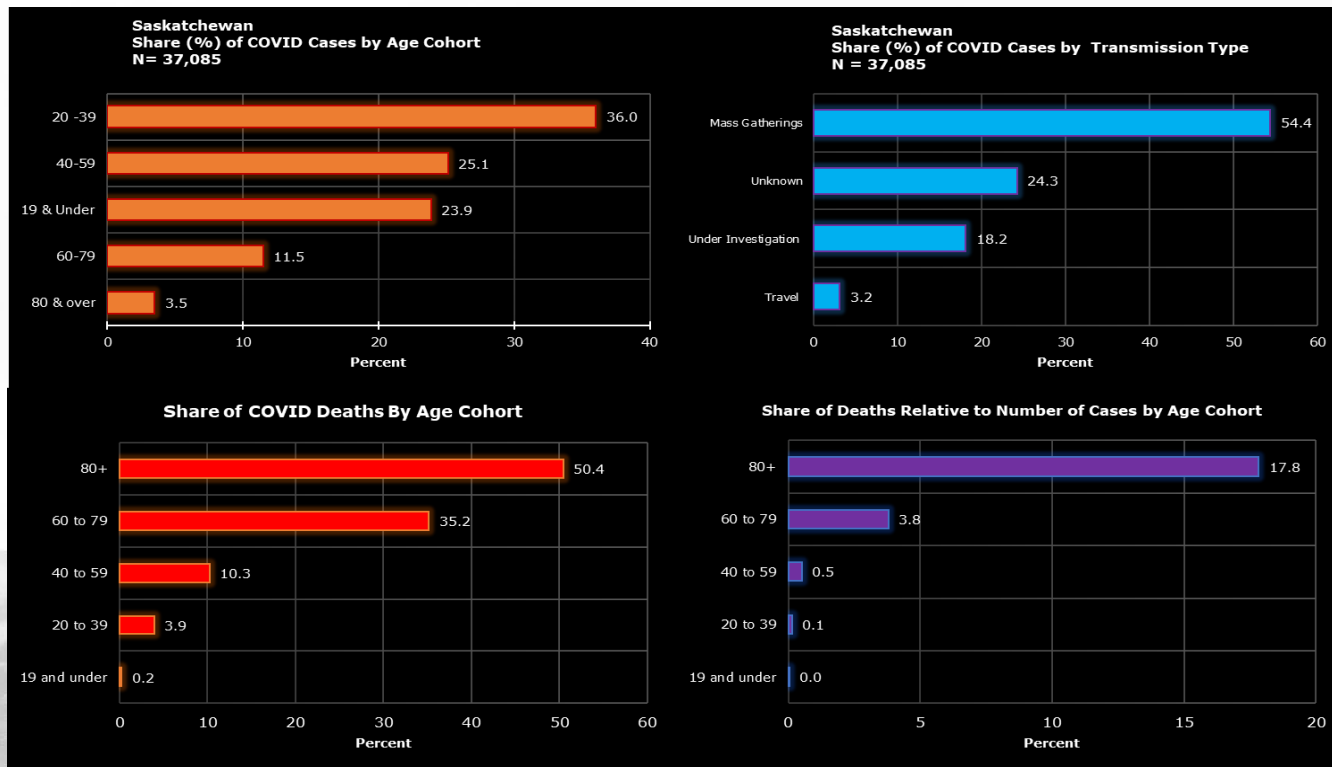
COVID-19 Deaths by Zone



COVID-19 Fatalities Per Capita



The charts on this slide show various case distributions in Saskatchewan. It groups the share of cases by deaths, by age, and the route of transmission. This slide also includes a chart that shows the percentage of deaths relative to the number of cases by age cohort. For example, the purple bar chart indicates that over 18% of those persons 80 and over who contracted the virus have died from it.



NATIONAL OVERVIEW

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 April 14, 2021)

Source: <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html>

Case Location	Population		Total Cases		Active cases		Recoveries	Deaths		Tested		
	Count	Share (%)	Count	Rate*	Count	Rate*	Count	Count	Rate*	Count	Rate**	Test Positivity Rate (%)
British Columbia	5,145,851	13.5	114,870	2,232	9,989	194	103,360	1,521	30	2,317,181	450,138	5.0
Alberta	4,428,112	11.7	164,531	3,716	15,569	352	146,933	2,029	46	3,863,365	873,694	4.3
Saskatchewan	1,177,884	3.1	37,085	3,148	2,525	214	34,102	458	39	709,016	601,553	5.2
Manitoba	1,379,584	3.6	35,539	2,576	1,439	104	33,146	954	69	617,554	447,742	5.8
Ontario	14,733,119	38.8	398,835	2,707	36,808	250	354,417	7,610	52	13,087,321	888,239	3.0
Quebec	8,575,779	22.6	331,031	3,860	13,660	159	306,608	10,763	126	7,638,706	890,856	4.3
Newfoundland and Labrador	520,998	1.4	1,034	198	18	3	1,010	6	1	229,026	438,661	0.5
New Brunswick	781,315	2.1	1,752	224	142	18	1,577	33	4	278,484	356,356	0.6
Nova Scotia	979,115	2.6	1,783	182	42	4	1,675	66	7	454,970	464,563	0.4
Prince Edward Island	159,713	0.4	165	103	6	4	159	0	0	132,097	827,546	0.1
Yukon	42,176	0.1	76	180	2	5	73	1	2	8,706	207,029	0.9
Northwest Territories	45,074	0.1	43	95	1	2	42	0	0	16,734	370,541	0.3
Nunavut	39,285	0.1	395	1,005	0	0	391	4	10	10,057	255,559	3.9
Repatriated travellers	N/A	N/A	13	N/A	0	N/A	13	0	N/A	9,827	N/A	0.1
Canada	38,008,005	100	1,087,152	2,860	80,201	211	983,506	23,445	62	29,373,044	772,812	3.7

Notes:

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

Rate* = per 100,000 populaiton

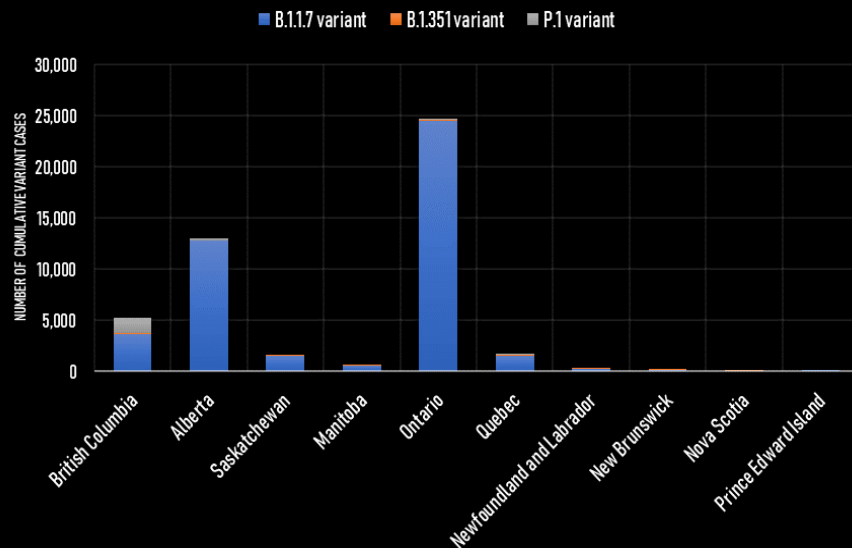
Rate** = per 1,000,000 population

Given the emergence of new COVID-19 variants, the table and chart on this slide shows the number of variants reported in each province and territory, and Canada as a whole. Ontario has the largest number of the B.1.1.7 variant, at 24,467 cases, known as the UK variant, while B.C. has the highest P1 variant. A “variant of concern” has changes that cause the virus to act differently in ways that are significant to public health (e.g., spreads more easily, causes more severe disease, requires different treatments or changes the effectiveness of current vaccines). The B.1.351 variant originated in South Africa, while the P.1 variant originated in Brazil.

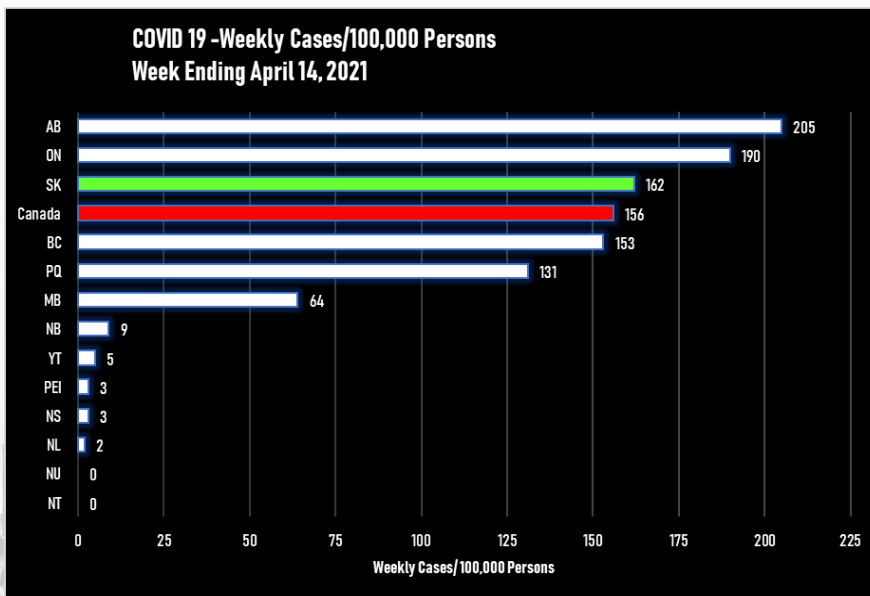
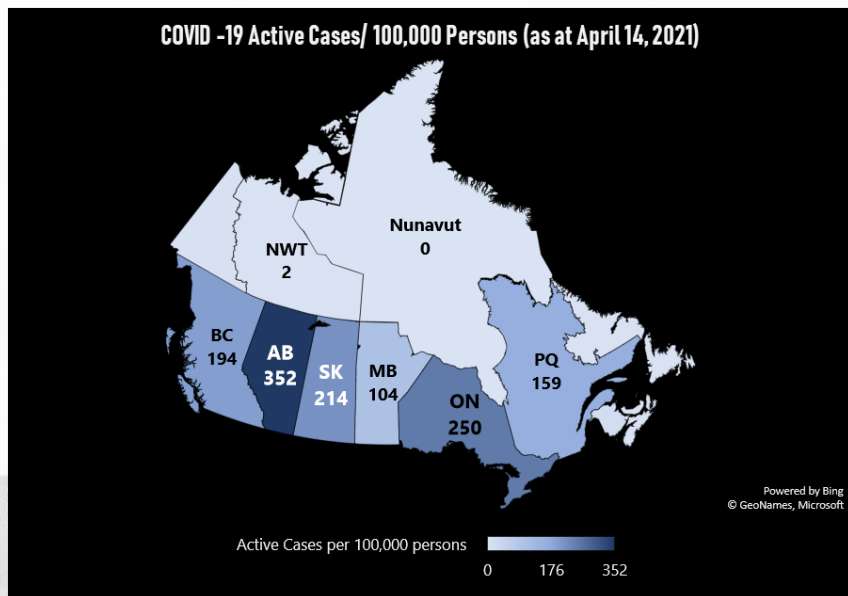
Cumulative number of variants of concern (VOC) publicly reported in Canada, by location, as of April 14, 2021

Location	B.1.1.7 (UK)	B.1.351 (South Africa)	P.1 (Brazil)
British Columbia	3,627	65	1,529
Alberta	12,765	29	138
Saskatchewan	1,426	9	0
Manitoba	490	20	0
Ontario	24,467	84	176
Quebec	1,435	160	6
Newfoundland and Labrador	178	1	0
New Brunswick	28	2	0
Nova Scotia	23	10	0
Prince Edward Island	6	0	0
Yukon	1	0	1
Northwest Territories	1	0	0
Nunavut	0	0	0
Total Canada	44,447	380	1,850

Variants of Concern By Type and Jurisdiction
N = 46,677

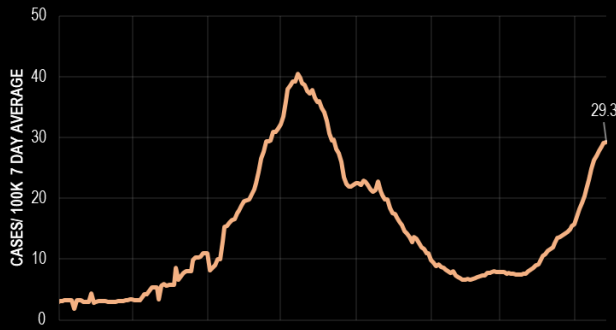


This slide adjusts two data sets for population. The map chart shows active COVID-19 cases by province and territory per 100,000 persons. The colour gradient illustrates the case intensity. Alberta has the highest active case rate per capita in Canada at 352. The second chart shows the change in weekly cases/ per 100,000 persons. Using this data set, Saskatchewan had 162 cases/100,000 persons over the last week, the third highest rate in Canada. (Note Saskatchewan's number differs from earlier slides due to population count differences between Saskatchewan Health and Statistics Canada).

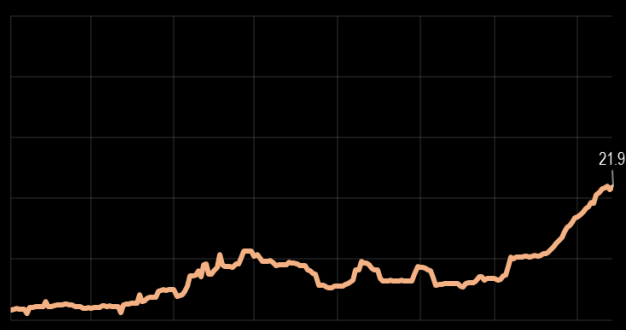


This slide compares case data on a per capita basis, since September 1, 2020. The case data is scaled by cases/per 100,000 population. It uses the 7-day average of cases adjusted for 100,000 population. It uses the same y-axis scale so that better comparisons about the COVID-19 impact be made for each 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. The trend shows Saskatchewan having the third highest case rate, averaging 23.2 cases per 100,000 over the last week.

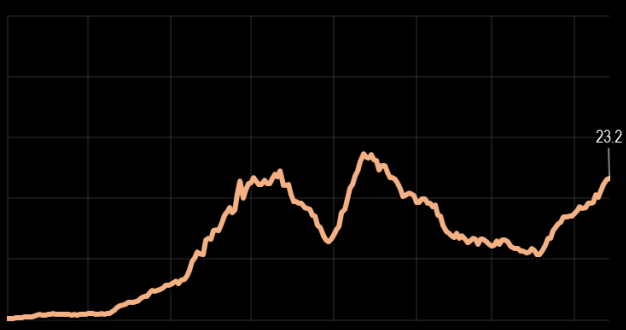
Alberta Case Rate - 7 Day Average/ 100,000 Persons



BC Case Rate - 7 Day Average/ 100,000 Persons



Sask. Case Rate 7 Day Average/100,000 Persons



Manitoba Case Rate - 7 Day Average/ 100,000 Persons



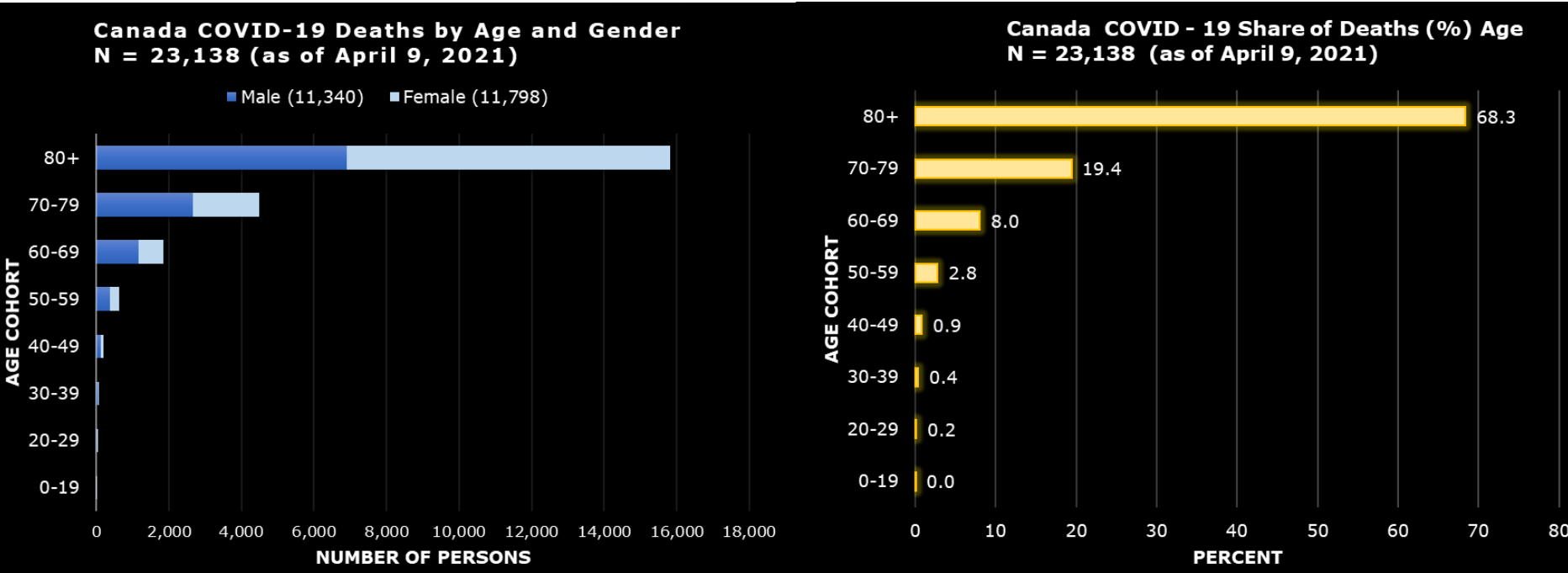
Ontario Case Rate 7 Day Average/ 100,000 Persons



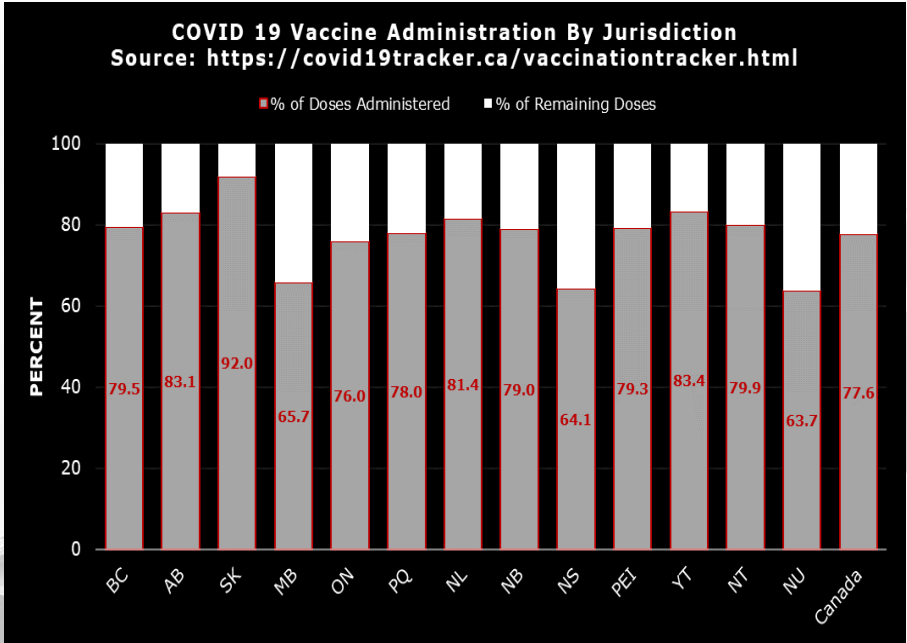
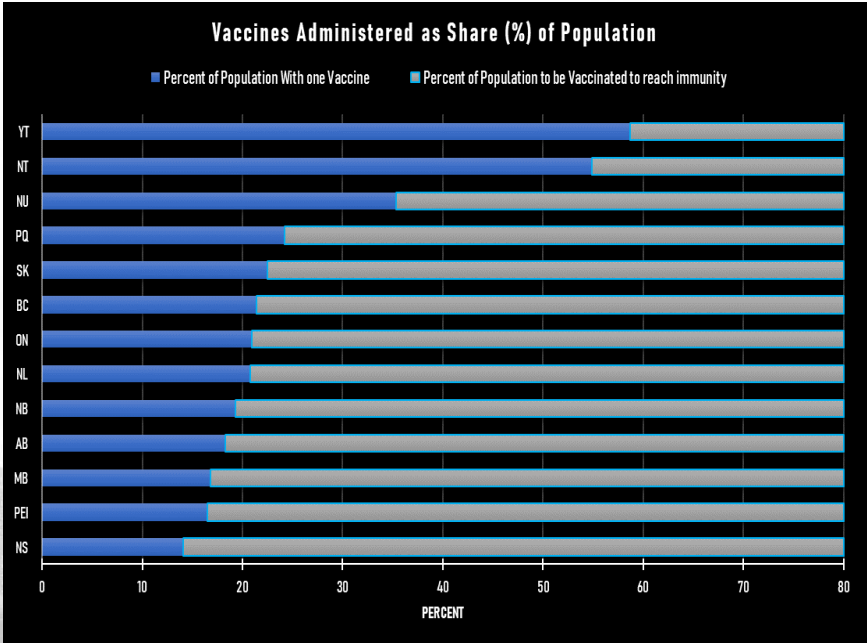
Quebec Case Rate - 7 Day Average/ 100,000 Persons



The charts on this slide show the number of COVID related deaths in Canada by age and gender as of April 9, 2021 (most recent report date). The left chart shows deaths by age cohort and gender. Females 80 and over account for more than half of all COVID related deaths in Canada. This is primarily due to fatalities emerging from long term care homes in several provinces. As shown in the right chart, about 70% of all COVID deaths in Canada are in the 80 and over cohort.



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 vaccinated at least once (the blue bar). Here, the goal is 80% vaccination, so the grey bar represents the gap to go. The stacked column chart on the right shows the percent of vaccines administered in each province and territory (including the Canadian total). The grey represents the percent administered while the white represents the percent yet to be administered. Note that all provinces are now under 100% as vaccine deliveries are increasing relative to previous weeks.





**QUESTIONS, COMMENTS OR
SUGGESTIONS?**
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