



FRAMEWORK INDICATORS A REVIEW OF COVID -19 STATISTICS UPDATED TO SEPTEMBER 22, 2021

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Risk Indicators for Monitoring COVID-19 Transmission in Saskatoon

Indicator	Green Minimal Risk	Yellow- Caution	Orange High Risk	Red Critical
7 Day Average Weekly Cases Per 100,000 persons	0 to 10	11 to 20	21 to 30	Greater than 30
7-Day Average Test Positivity Rate (%)	0 to 3.0%	3.1 to 6.0 %	6.1% to 10%	Greater than 10%
Effective Reproduction Rate	Less Than 1.0	1.01 to 1.2	1.21 to 1.4	Greater than 1.4
Vaccination Rates of Total Population (%)	90% or greater	75 to 90%	60 to 75 %	Less than 60%

Saskatoon's Status as of September 22, 2021

The data charts and trends on the subsequent slides.

Primary Indicator	Status as of September 22, 2021
7 Day Average Weekly Cases Per 100,000 persons	31.1
7-Day Average Test Positivity Rate (%)	11.8%
Effective Reproduction Rate (Sample Mean)	0.97
Vaccination Rates of Total Population (%)	60.5%
Status	Orange

Primary COVID-19 Transmission Risk Indicators - Saskatoon

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 (to a maximum of 100). All zones are experiencing high per capita case counts. The red dotted line indicates when the provincial public health order was lifted on July 11, 2021.

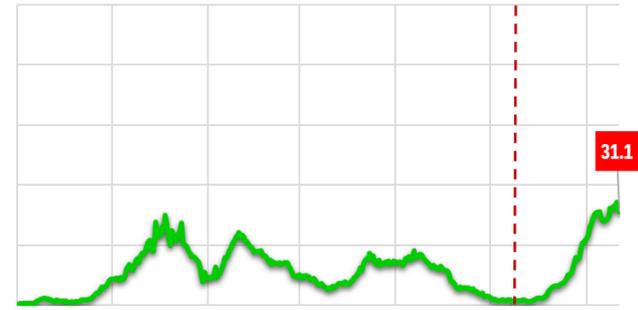
Far North 7 Day Average Per Capita



North 7 Day Average Per Capita



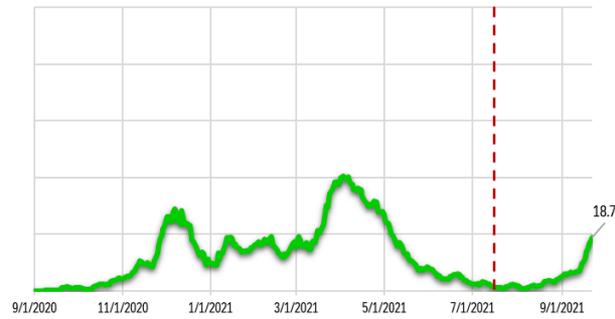
Saskatoon 7 Day Average Per Capita



Central 7 Day Average Per Capita



Regina 7 Day Average Per Capita

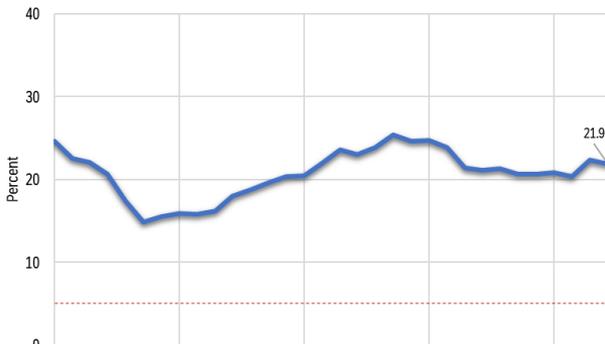


South 7 Day Average Per Capita

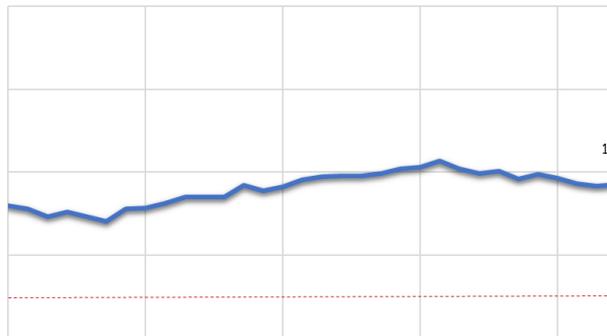


Test Positivity Rates 7 Day Average: This slide shows panel charts using the 7 day average the test positivity rate for each aggregate zone. It is calculated by the 7 day Average of new cases divided by the 7 day average of new tests. The data starts on August 22, 2021 because there is no testing data by zone for late June, all of July and the first two weeks of August. The red line indicates the World Health Organization Standard of 5% for a controlled level of positive cases. A test positivity rate of less than 5% typically means the transmission is under control.

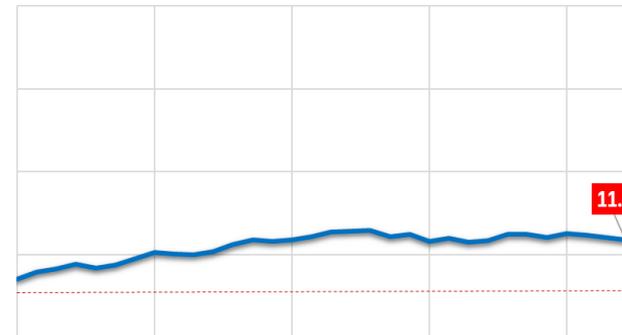
Far North Test Positivity Rate 7-Day Average



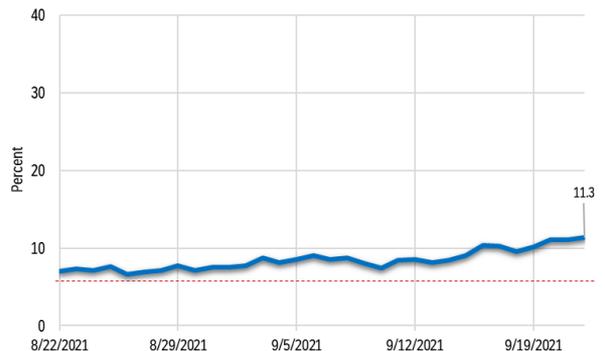
North Test Positivity Rate 7-Day Average



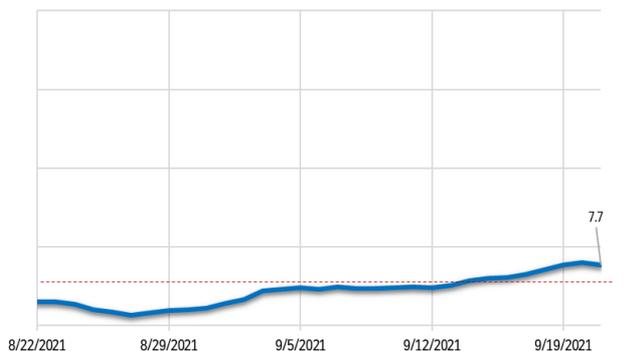
Saskatoon Test Positivity Rate 7-Day Average



Central Test Positivity Rate 7-Day Average



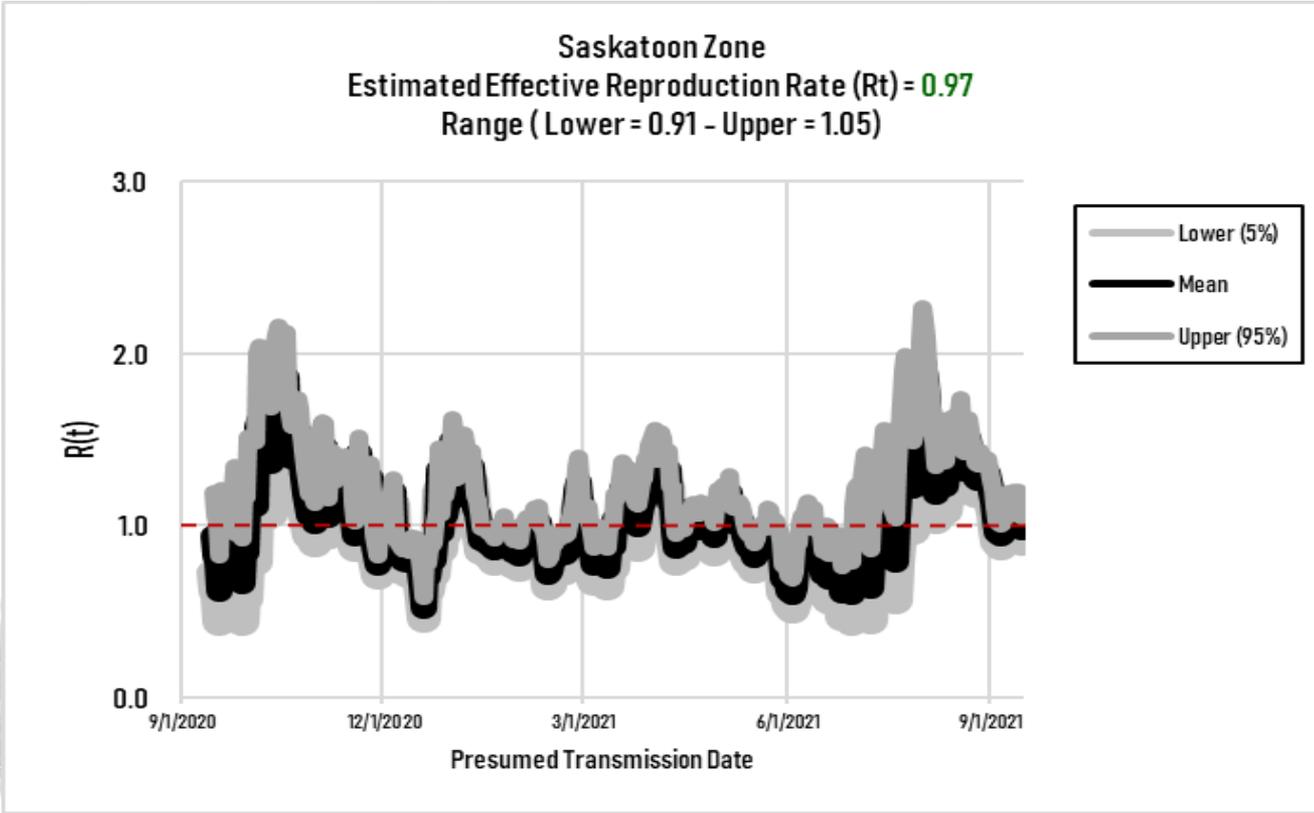
Regina Test Positivity Rate 7-Day Average



South Test Positivity Rate 7-Day Average

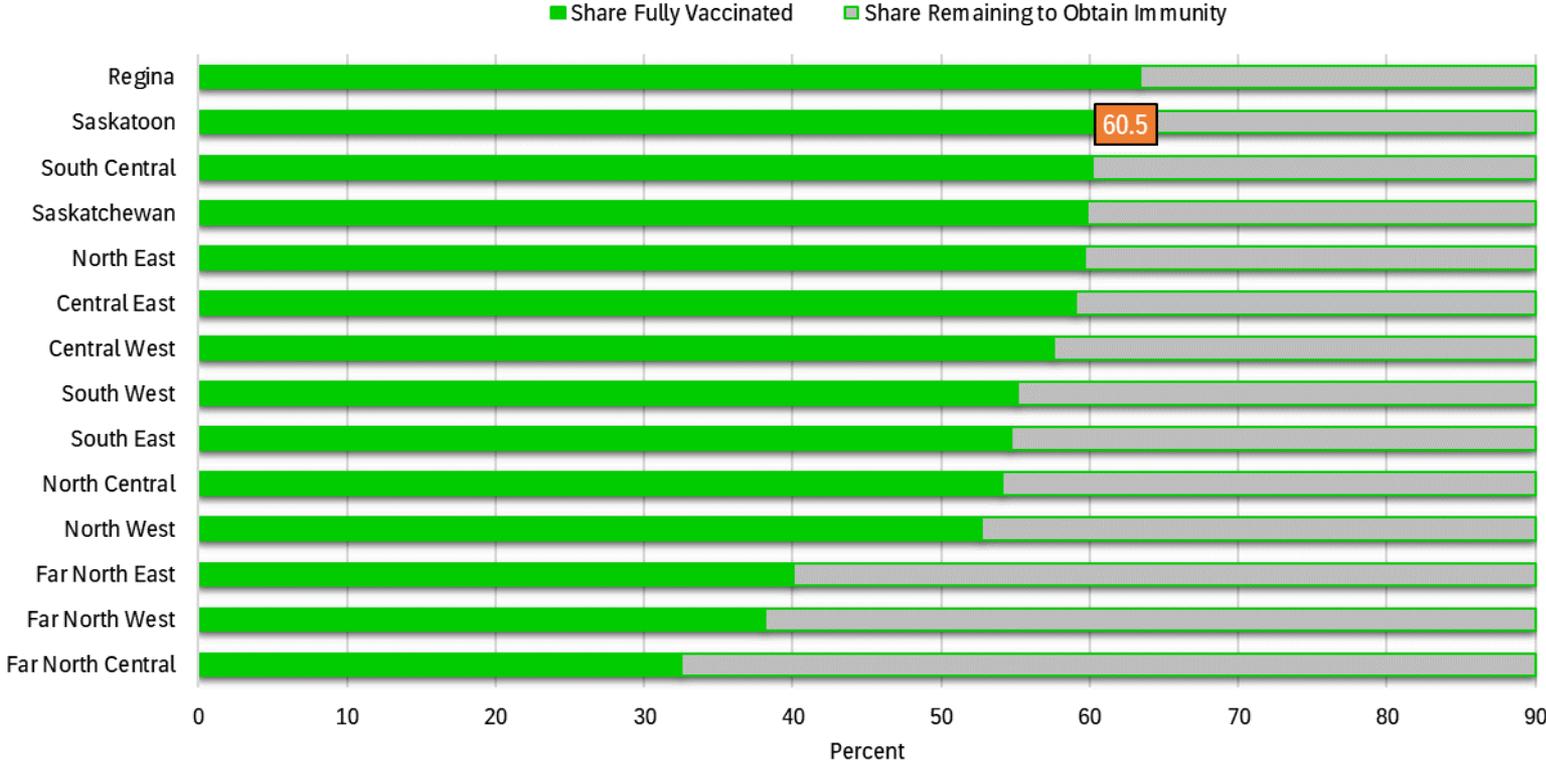


This slide estimates the Effective Reproduction Number (Rt) for Saskatoon. A few points to note here. (1) The dates are lagged because Rt uses recent case history to estimate the infection rate that caused them, referred to as the "presumed transmission date". This date occurs about 7 days prior to reporting 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.

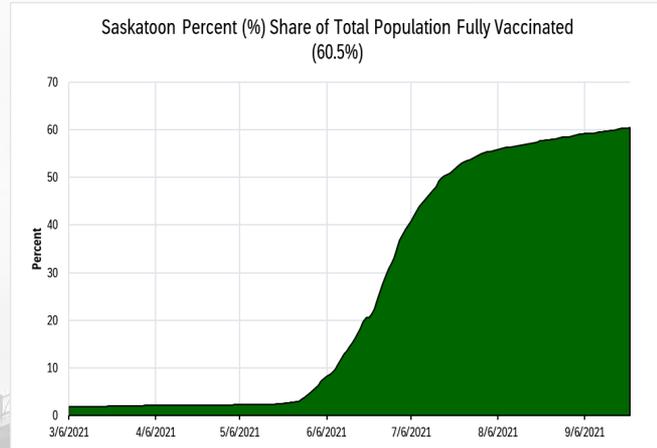
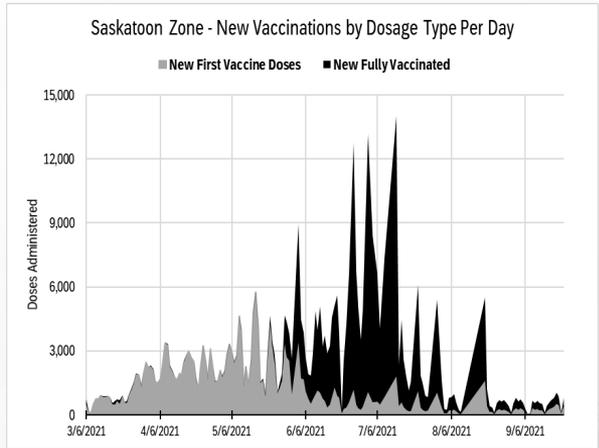
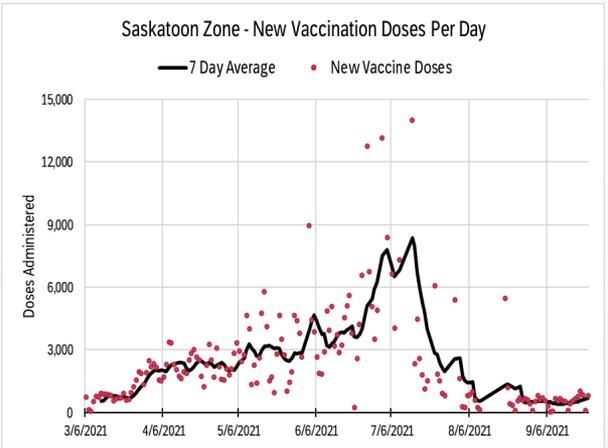


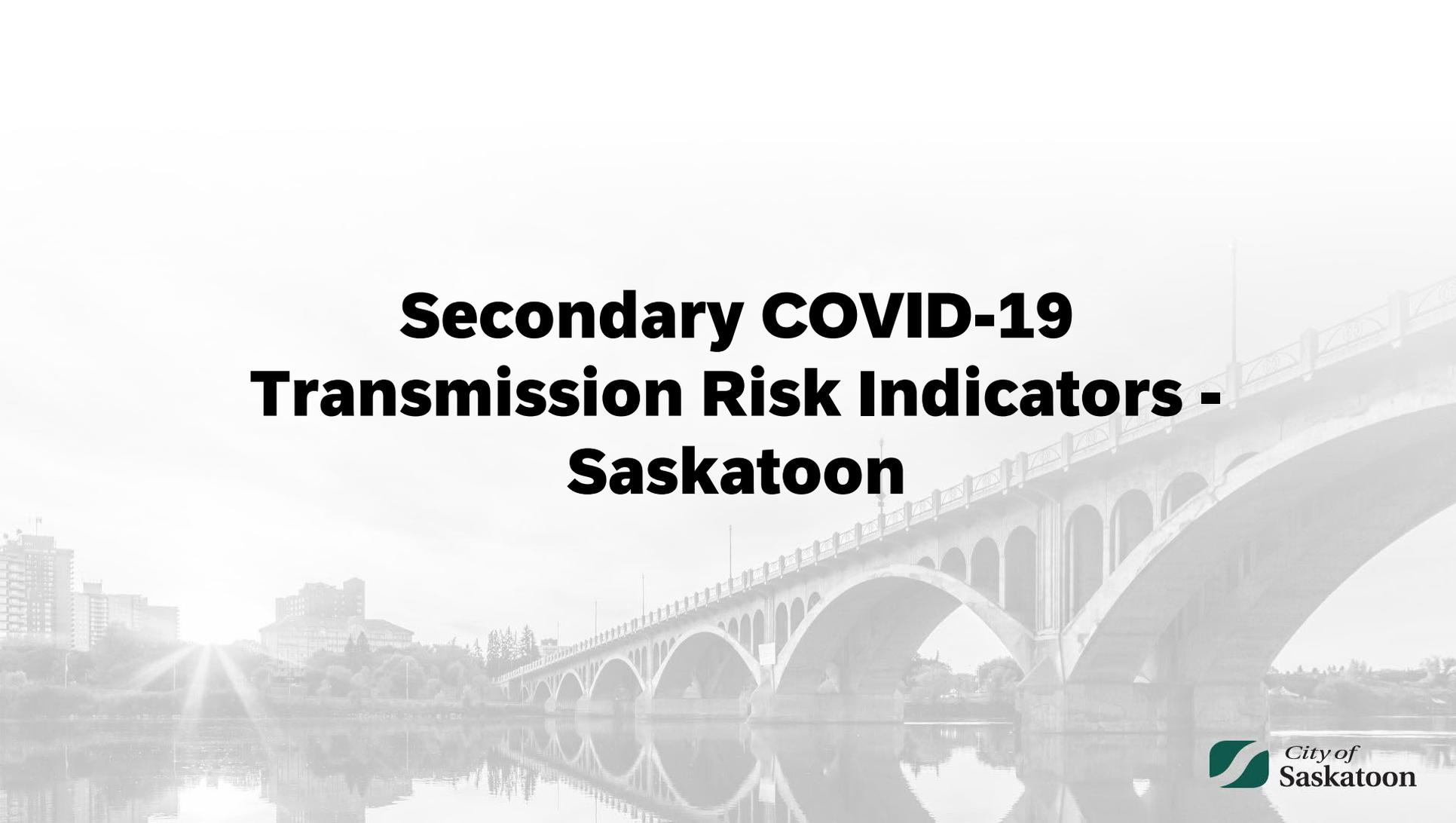
Vaccine Progress by Zone. This slide shows vaccinations by zone as percentage of the total population. There are about 721,000 persons fully vaccinated in Saskatchewan or 59.6%. In Saskatoon, 204,000 persons are fully vaccinated or slightly above at 60.5%. The chart on this slide shows the progress to reach immunity, which is suggested to be 90%.

Share of Total Population Fully Vaccinated by Health Zone (includes under 12 years) Goal = 90%



Vaccines progress Saskatoon Zone. This slide shows vaccinations for the Saskatoon zone in a few different ways. The first chart shows new vaccination doses per day and smoothed by a 7-day average. The second chart shows new first and fully vaccinated doses in Saskatoon. The black area is the second dose or fully vaccinated dose. The third chart shows a time series of percent share of the Saskatoon population fully vaccinated.

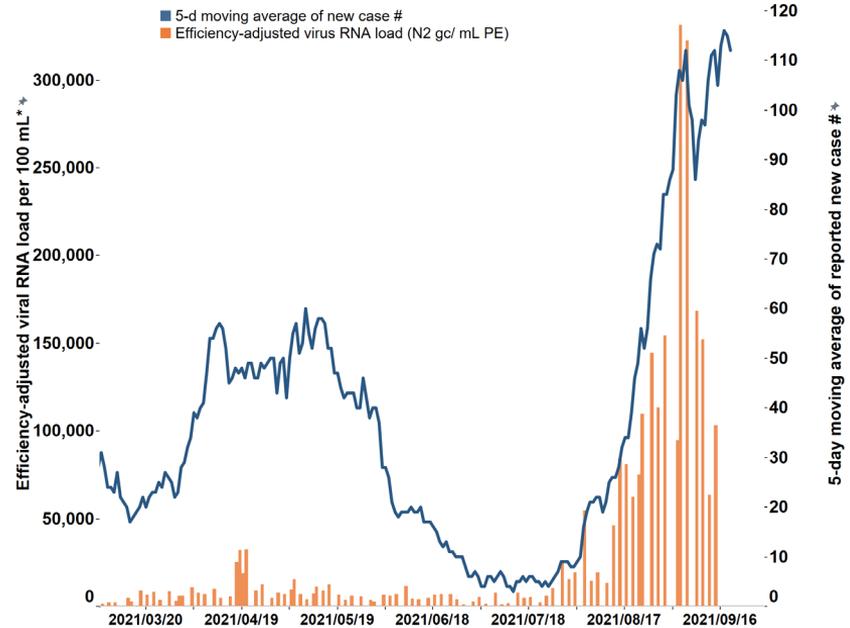




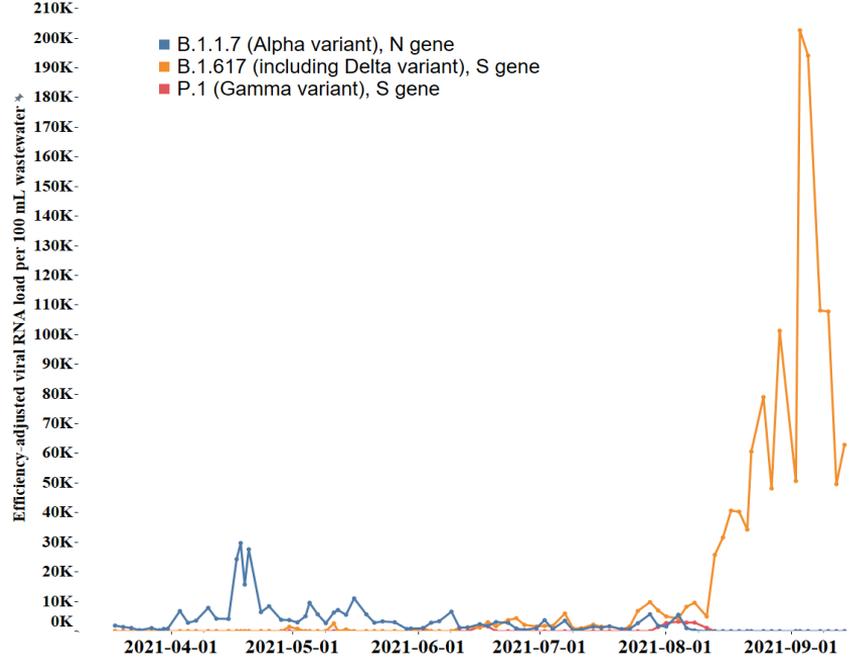
Secondary COVID-19 Transmission Risk Indicators - Saskatoon

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 against the 5-day rolling average of new reported cases (blue line). 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 VOCs. As the chart shows, the concentration of the Delta VOC in the wastewater has fallen sharply relative to previous dates. Variant tracking data should be seen merely as an indicator of trends within one variant, rather than for comparison among variants. Due to differences in sensitivity of the underlying tests and epidemiology, comparisons of absolute viral loads among variants are not straightforward.

Viral RNA load of SARS-CoV-2 in wastewater, City of Saskatoon

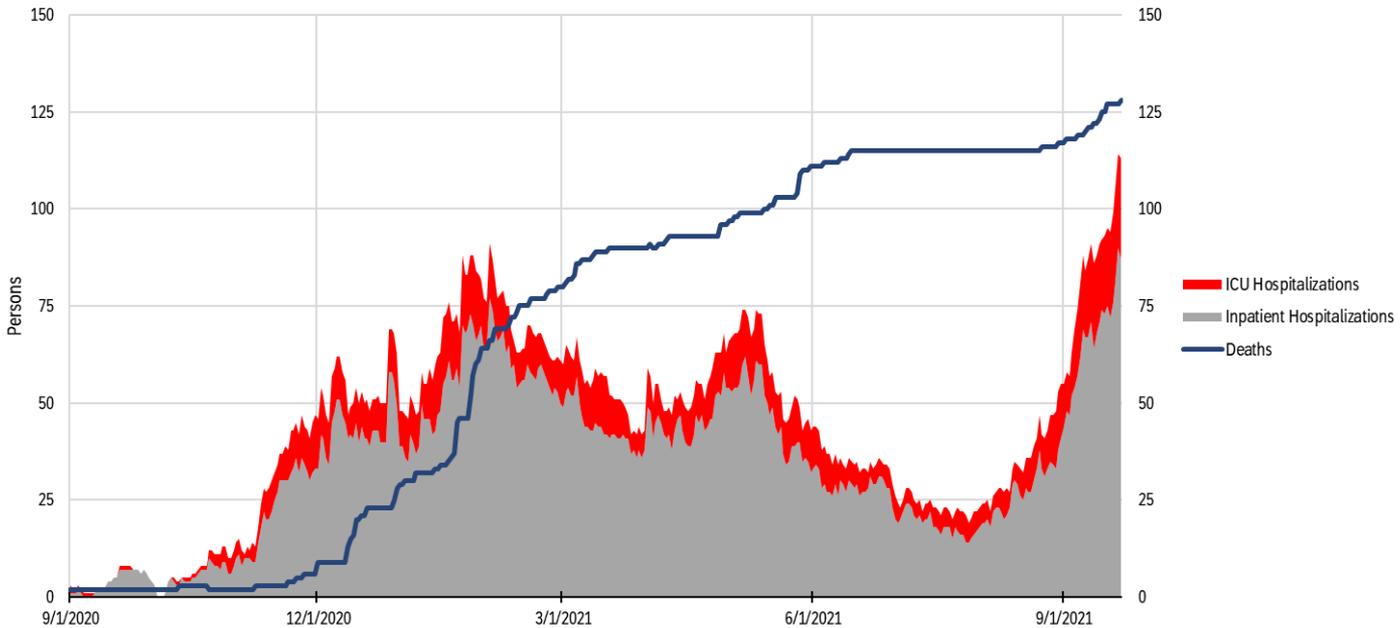


Viral RNA load of key variants in wastewater, City of Saskatoon



Hospitalizations & Deaths. This slide shows total hospitalizations and ICU hospitalizations for the Saskatoon zone. Total hospitalizations and ICU hospitalizations are at record peaks. ICUs are about 23% of total hospitalizations for Saskatoon. Fatalities tend to follow an increase in hospitalizations as shown by the blue line on the chart.

Saskatoon Zone Hospitalizations & Deaths - Cumulative to September 22, 2021
Source: <https://dashboard.saskatchewan.ca/health-wellness/covid-19/cases>

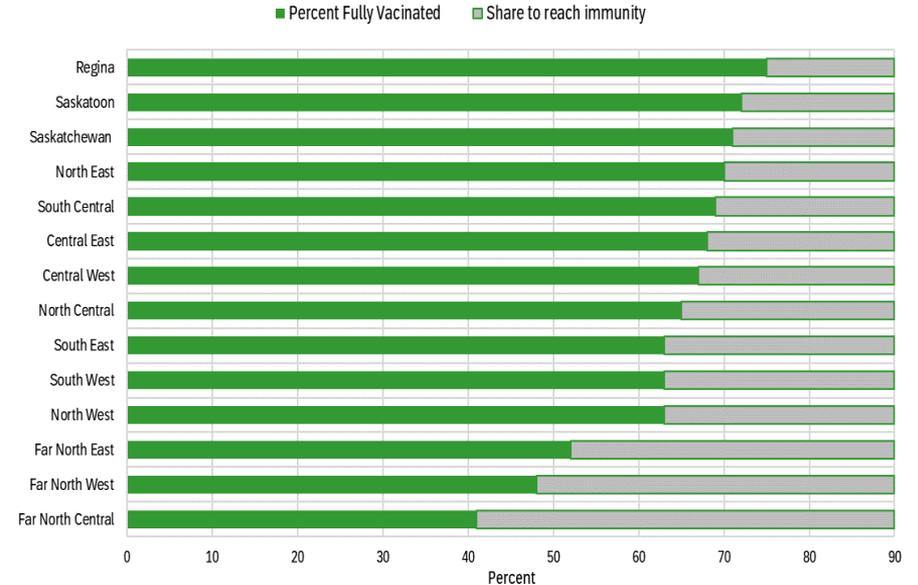


Vaccine Progress by Age. This slide shows vaccinations by zone and age group in Saskatchewan. The table on the left shows the percent share of the population of those persons fully vaccinated for each age cohort in each zone. The color coding shows lower to higher rates. This is for persons 12 years of age and older, so it will show higher percentage than including the total population. The Far North has substantially lower vaccination rates than the rest of the zones. For Saskatchewan, the lowest rates are in the 12-17 and 18-29 age cohorts. The chart on the right shows the progress to reach the generally accepted immunity target of 90%, given the strength of the Delta VOC. Saskatchewan needs to fully vaccinate 20% more of the eligible population to reach that target.

Saskatchewan: Percent of Fully Vaccinated Persons 12 Years of Age and Older By Zone
As of September 22, 2021

Zone	12-17	18-29	30-39	40-49	50-59	60-69	70-79	80+	Total
Far North West	33	34	39	50	57	66	78	81	48
Far North Central	19	31	37	50	60	73	72	64	41
Far North East	40	39	44	58	66	79	82	70	52
North West	45	46	51	65	74	80	87	95	63
North Central	50	51	55	62	73	80	87	90	65
North East	57	59	59	67	72	81	86	89	70
Saskatoon	65	62	65	71	76	84	85	84	72
Central West	51	52	54	62	68	81	88	93	67
Central East	52	53	56	63	71	80	87	90	68
Regina	71	64	66	73	80	88	89	89	75
South West	51	49	53	61	67	76	80	82	63
South Central	56	56	58	64	73	82	87	90	69
South East	50	51	52	59	69	78	85	91	63
Saskatchewan	58	58	62	70	77	84	88	90	71

Vaccination By Progress by Zone, By Eligible Population (12 & Over)



General Monitoring Statistics

Table A shows various COVID statistics by Saskatchewan Health Zones to show the incidence of COVID in various parts of Saskatchewan. 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 and the cumulative test positivity rate. The reason for the adjustments is to show per capita comparisons on the various indicators and their intensity. 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 Data as of September 22, 2021)

Source: Author Calculations from <https://dashboard.saskatchewan.ca/health-wellness>

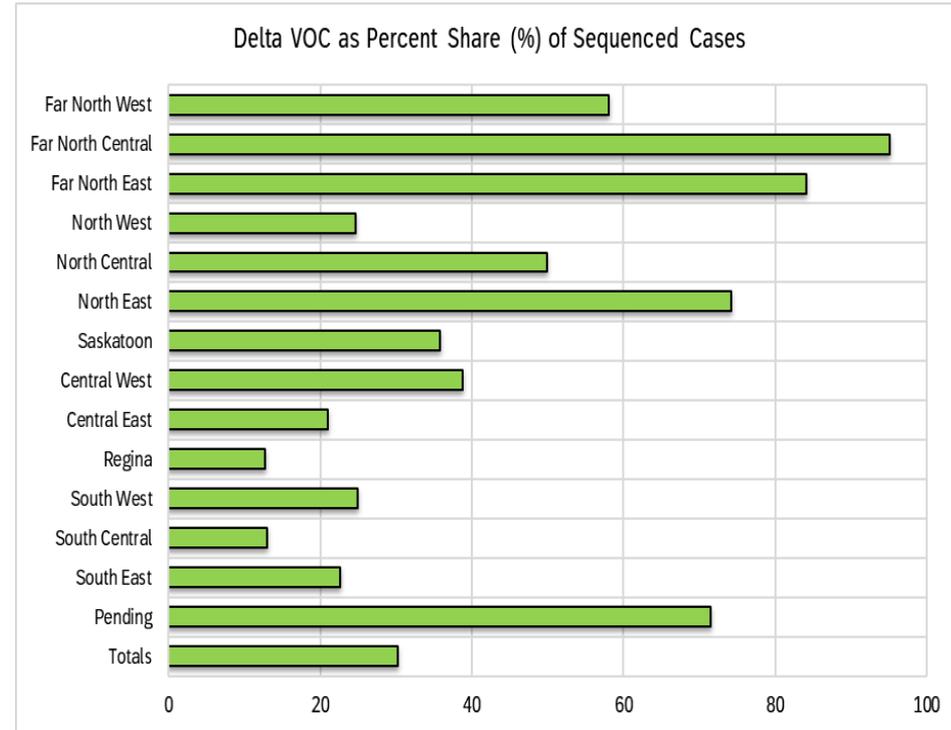
Location	Demographics		Cases				Hospitalizations		Recoveries	Fatalities		Tests		
Zone	Population Estimates (2021)	Share of Population (%)	Total Cases	Total Case Rate*	Active Cases	Active Case Rate*	Inpatient	ICU	Count	Deaths	Death Rate*	Total Tests	Test Rate*	Test Positivity Rate (%)
Far North West	29,813	2.5	3,654	12,256	219	734.6	6	0	3,398	37	124.1	27,772	93,154	13.2
Far North Central	2,649	0.2	525	19,819	13	490.8	0	0	508	4	151.0	2,704	102,076	19.4
Far North East	24,249	2.0	3,668	15,126	342	1410.4	0	0	3,305	21	86.6	25,352	104,549	14.5
North West	82,386	6.8	6,413	7,784	670	813.2	22	3	5,654	89	108.0	58,329	70,800	11.0
North Central	88,991	7.4	6,457	7,256	528	593.3	20	7	5,856	73	82.0	74,165	83,340	8.7
North East	41,560	3.4	2,355	5,667	256	616.0	5	0	2,079	20	48.1	30,333	72,986	7.8
Saskatoon	338,106	28.1	15,294	4,523	1,079	319.1	87	26	14,087	128	37.9	294,079	86,978	5.2
Central West	36,962	3.1	1,143	3,092	97	262.4	5	0	1,039	7	18.9	20,342	55,035	5.6
Central East	98,368	8.2	2,980	3,029	242	246.0	6	3	2,717	21	21.3	66,854	67,963	4.5
Regina	273,351	22.7	13,168	4,817	467	170.8	30	9	12,540	161	58.9	225,426	82,468	5.8
South West	38,670	3.2	1,518	3,926	164	424.1	15	3	1,338	16	41.4	23,170	59,917	6.6
South Central	60,459	5.0	2,309	3,819	194	320.9	7	3	2,090	25	41.4	50,543	83,599	4.6
South East	89,294	7.4	3,455	3,869	262	293.4	8	0	3,144	49	54.9	59,567	66,709	5.8
Unassigned (Pending)	0	0.0	476	0.0	173	0.0	0	0	303	0	0.0	143,338	0	0.0
Total Saskatchewan	1,204,858	100.0	63,415	5,263.3	4,706	390.6	211	54	58,058	651	54.0	1,101,974	91,461	5.8

* indicates rates are per 100,000 persons

VOCs – Recent COVID-19 cases in Saskatchewan are being driven by Variants of Concern (VOC), especially the Delta Variant. The VOC are mutations of the COVID-19 virus and can be more contagious than the original SARS-COV2. Table B illustrates the VOC cases by various types in each zone. The chart of the right shows the percent share of the Delta Variant by zone relative to the total known VOCs. In the Far North Zones, the Delta Variant comprises over 50% of all known VOC cases, with at

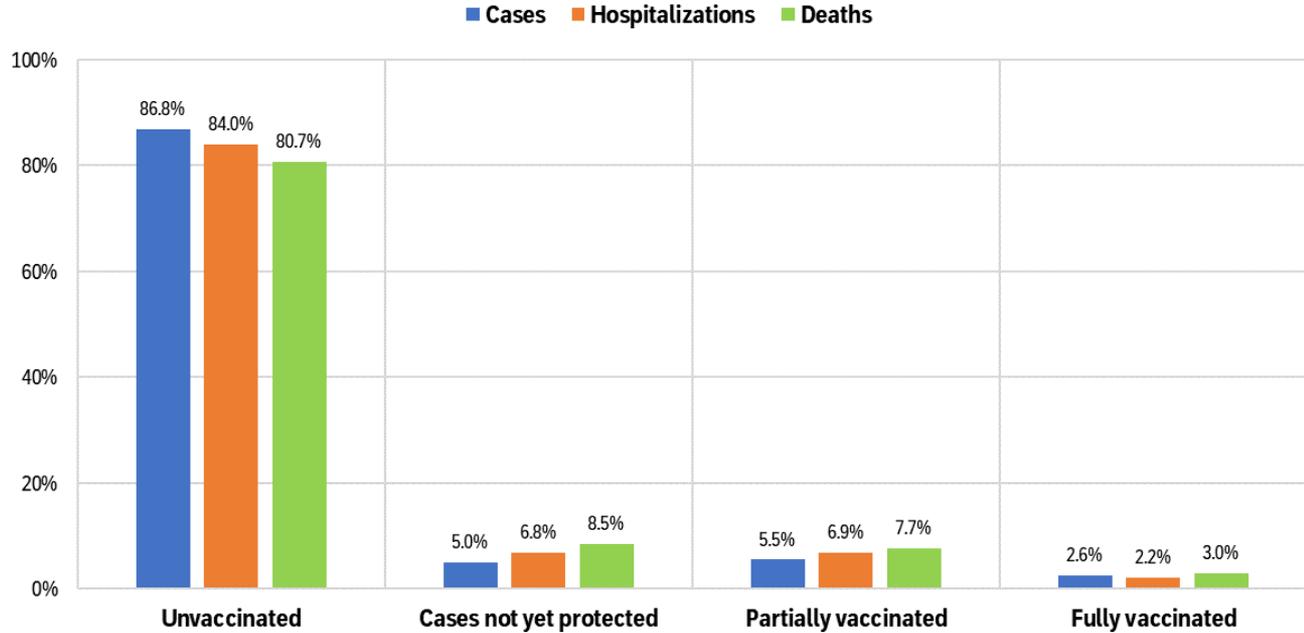
Table B: Saskatchewan Variants of Concern by Zone (September 22, 2021)
 Source: Author Calculations from <https://dashboard.saskatchewan.ca/health-wellness>

Location	Variants of Concern			
Zone	B.1.1.7 (Alpha)	B.1.351 (Beta)	P.1 (Gamma)	B.1.617.2 (Delta)
Far North West	212		23	325
Far North Central	4			78
Far North East	56		12	362
North West	351		249	196
North Central	345	9	26	378
North East	66		2	196
Saskatoon	1,137	1	125	706
Central West	107		2	69
Central East	405		5	109
Regina	2,837		5	416
South West	251		26	92
South Central	636		2	95
South East	691		1	203
Unassigned	25		4	73
Total Saskatchewan	7,123	10	482	3,298



Cases by Vaccination Status. This slide shows the composition of cases, deaths and hospitalizations by vaccine status as published by the Public Health Agency of Canada. The data clearly shows the vaccine efficacy in preventing cases and serious outcomes. About three percent of the cases, hospitalizations, and deaths in Canada recorded since early December 2020 are in fully vaccinated persons. The data is lagged by about three weeks and the sample size (N) is over 725,000 cases.

National COVID Cases by Vaccine Status (N= 725,291) as of September 4,-2021
Source: <https://health-infobase.canada.ca/covid-19/epidemiological-summary-covid-19-cases.html#a9>





**QUESTIONS, COMMENTS OR
SUGGESTIONS?
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