Community Respiratory Illness Surveillance Program (CRISP) Situation Report: June 22, 2023 (Reporting Period May 21 – June 17, 2023)

Summary

- COVID-19 activity decreased over the past month from an average of 50 positive tests over the previous three weeks to 37 in the most recent surveillance week. Test positivity is 3.1%.
- Respiratory Syncytial Virus (RSV) has reached a point of inactivity with one case in the most recent reporting period.
- Influenza activity in Saskatchewan decreased over the past four weeks, and has dipped below the inter-seasonal 2% test positivity threshold. Type A accounted for the majority of cases.
- COVID-19, Influenza, and other respiratory viruses account for 37%, 3%, and 57% of hospitalizations due to respiratory illnesses across the province. Total hospital admissions for respiratory viruses have decreased in the most recent four weeks (from 388 to 187).
- Sentinel indicators of respiratory transmission in the community fluctuates, as the season wanes:
    - Weekly visits to the Saskatchewan emergency departments for respiratory-like illness (RLI) slightly decreased to 16.7 per 1,000 this week from 17.6 per 1,000 in the week ending May 27.
    - School-absenteeism in the most recent four weeks appeared to be stable, ranging from 8.4% to 9.2%. In the most recent reporting week, it was 8.7%.
    - Calls to HealthLine 811 for respiratory-like illness in the most recent four weeks decreased from 67.4 to 46.5 per 1,000 calls in the most recent week.
    - Regina and Moose Jaw wastewater viral load decreased from high to moderate-high. Yorkton increased from moderate to high. South West remained stable at high.

COVID-19

- The number of positive lab tests for COVID-19 decreased from 76 in the week ending May 27 to 37 in the most recent week. Test positivity dropped from 5.4% to 3.1% in the same time period.
- COVID-19 cases are largely in the 20 to 64 years (28.1%) and 65+ years (56.3%) age groups.
- One COVID-19 outbreak was reported in a high-risk setting in the past four weeks.
- XBB.1.5 and its sublineages (denoted as XBB.1.5*) are the most commonly detected variants (66.9% of the current reporting period), followed by XBB.1.16* (17.5 %) and XBB.1.9.1* (6.3%).
- COVID-19 hospitalizations have decreased from 219 for the previous four weeks, to 70 for the most recent four weeks. COVID-19 ICU admissions have decreased from 21 for the previous four weeks, to five for the most recent four weeks.
- The proportion of staffed inpatient beds occupied by COVID-19 patients decreased to 2.3% for the most recent week.
- In the last four weeks, nine deaths were associated with COVID-19.

- Having a COVID-19 booster in the last six months (October 1, 2022 – March 31, 2023) reduces the risk of a COVID-19 death four times compared to unvaccinated individuals and over two times compared to those without a booster dose. Of those aged five years and older, 5% have received their latest booster dose in the last six months. With the exception of Regina, all areas of the province have less than 50% of their population up-to-date[1] for COVID-19 vaccines.
- Only 21% (n = 222,695) of individuals aged 12+ years have received a bivalent booster dose.
- Less than half of individuals aged 50+ have had more than one booster dose (47%).

Influenza

- Influenza activity showed a gradual decrease over the past four weeks with sporadic cases mainly in the Far North West and Saskatoon. All of the cases in the past week were type A.
- Influenza test positivity fluctuated between 1.9% and 2.1% over the past four weeks. Positivity of 2.0% is the inter-seasonal threshold for influenza.
- Influenza type A cases affected all age groups in the past four weeks while sporadic type B cases were seen in the working age group and preschoolers.
- No influenza outbreaks in high-risk settings were reported in the past month.
- Influenza hospitalizations have decreased from 26 for the previous four weeks, to six for the most recent four weeks. Influenza ICU admissions have decreased from four for the previous four weeks, to zero for the most recent four weeks.
- No deaths due to influenza were reported in the past four weeks.
- The influenza immunization campaign launched October 11, 2022. As of March 31, 2023, 27% of the Saskatchewan population have received an influenza vaccine. This is a 9% decrease in doses administered compared to the same time last year and no change from the previous month.

Other Respiratory Viruses[2]

- RSV activity continued to decrease with only one lab detection in a preschooler in the past four weeks.
- RSV hospitalizations have decreased from eight for the previous four weeks, to zero for the most recent four weeks. RSV ICU admissions have decreased from two for the previous four weeks, to one for the most recent four weeks. 'Other' respiratory viruses' hospitalizations have decreased from 131 for the previous four weeks, to 107 for the most recent four weeks. 'Other' respiratory viruses ICU admissions have increased from 16 for the previous four weeks, to 23 for the most recent four weeks.
- 'Other' respiratory virus lab detections fluctuated between 71 and 88 over the past month, similar to the previous four week period. The positivity rate averaged 7.6% per week over the past four weeks.
- Outbreaks from 'other' viruses in high-risk settings averaged about two per week over the past four weeks.

[1] *Up-to-date = completed a primary series and at least one additional booster, age 5+ years*

[2] *Parainfluenza viruses 1 – 4 (PIV 1 – 4); Adenovirus (ADV); Rhinovirus (RV); Human Metapneumovirus (HMPV); NOTE: RSV test positivity now exceeds 1% and is reported separately. * Represents all sublineages of Omicron*

Table 1: Viral indicators by surveillance period, May 21 – June 17, 2023

Report date	COVID-19 positive laboratory test	COVID-19 test positivity	COVID-19 outbreaks	Influenza positive laboratory test	Influenza test positivity	Influenza outbreaks	RSV positive laboratory test	RSV test positivity	'Other'[1] positive laboratory test	'Other'[1] test positivity	'Other'[1] outbreaks
June 11 – 17, 2023	37	3.1%	1	7	1.3%	0	0	0.0%	88	7.5%	2
June 04 – 10, 2023	36	3.5%	0	9	1.5%	0	1	0.2%	71	6.7%	2
May 28 – June 03, 2023	36	2.9%	0	11	2.1%	0	0	0.0%	84	8.2%	2
May 21 – 27, 2023	76	5.4%	0	11	1.9%	0	0	0.0%	74	7.8%	0

Notes: [1]*Parainfluenza viruses 1 – 4; Adenovirus; Human Metapneumovirus, seasonal Coronavirus. See Technical Notes for details. This week's COVID-19 test positivity. This week's COVID-19 test positivity includes data from June 10 – June 16.*

Table 2: Patient-confirmed respiratory illness by age group, June 11 – June 17, 2023

Age group (Years)	COVID-19 case count	Influenza case count	RSV case count	Others case count[1]
0-4	3 (9.4%)	0	0	N/A
5-19	2 (6.3%)	1 (17%)	0	
20-64	9 (28.1%)	5 (83%)	0	
≥65	18 (56.3%)	0	0	
Total	32 (100%)	6 (100%)	0%	88 (100%)

Notes: [1]*Parainfluenza viruses 1 – 4; Adenovirus; Human Metapneumovirus, seasonal Coronavirus; age-specific data is unavailable (N/A) for other respiratory pathogens. Due to the rounding, total percentage may not add to 100%. See Technical Notes for further details.*

Table 3: Sentinel* indicators by surveillance period, May 21– June 17, 2023

Report date	School illness absenteeism >=10%[1]	RLI** ED visits per 1,000[2]	RLI** 811 calls per 1,000	COVID-19 Wastewater indicator[3]	Sentinel provider test positivity	Most commonly detected virus: Sentinel providers
June 11 – 17, 2023	8.7%	16.7	46.5	Moderate-high (n=2) High (n=2) No data (n=3)	0.0%	N/A[¥]
June 04 – 10, 2023	8.6%	16.9	37.6	Low (n=3) Moderate (n=1) High (n=3)	66.7%	Rhinovirus
May 28 – June 03, 2023	9.2%	16.5	62.6	Low (n=3) Moderate (n=1) High (n=3)	40.0%	Parainfluenza virus
May 21 – 27, 2023	8.4%	17.6	67.4	Low (n=3) No data (n=4)	55.6%	Parainfluenza virus

*Notes: *Sentinel surveillance are sampling programs representative of the population; [1]School absenteeism is the proportion of scheduled children who were absent from the class due to illness. The type of illness is not specified. Due to Spring break schools were closed and no absenteeism data was available for the week of April 2 to 8. Not Available (N/A[¥]). [2]Respiratory-like illness (RLI) are based on reports from ten of thirteen reporting areas for all weekly report date. [3]Count of wastewater treatment facilities reporting low, moderate or high levels of viral load causing COVID-19 infection (see Technical Notes for details).*

Table 4: Outcome, health care capacity and immunization coverage indicators by surveillance period, May 21 – June 17, 2023[¥]

Report date	Hospital admissions – COVID-19[1]	ICU admissions – COVID-19	Hospital admissions – Influenza	ICU admissions – Influenza	Hospital admissions – RSV	ICU admissions – RSV	% of staffed inpatient beds occupied by COVID-19 patients[2]	Deaths – COVID-19[3]	Deaths – Influenza[3]	Proportion of population up-to-date – COVID-19 vaccine[4]	Proportion of population immunized for Influenza vaccine[5]
June 11 – 17, 2023	10	1	0	0	0	0	2.3%	0	0	46.3%	27%
June 04 – 10, 2023	20	1	2	0	0	0	2.5%	2	0	46.3%	
May 28 – June 03, 2023	18	3	3	0	0	0	3.0%	2	0	46.3%	
May 21 – 27, 2023	22	0	1	0	0	1	3.3%	5	0	46.3%	

*[¥]Additional information on hospital admission stratified by respiratory organism and age group is provided below in **Figure 5** and **6** respectively. Viral infection may not be the main reason for the admission.*

[3]Nine COVID-19 deaths were reported in the past four weeks. *No influenza deaths reported in the last four weeks.*

Cases by respiratory organisms across the age groups

- From May 21 to June 17, 2023 there were 187 respiratory illness cases hospitalized with lab-positive Covid19 (70), influenza (6), RSV (0), other respiratory illnesses (107), and co-infected cases (4). Among the 187 cases, Covid19 lab positives (70), were among age groups of 0-19 (8), 20-59 (11), and ≥60 (51). Influenza lab positives (6) cases were among the age group of 0-19 (4) and ≥60 (2). For other respiratory lab positives (107) cases were in the age group of 0-19 (60), 20-59 (21), and ≥60 (26). For Co-infections lab positives (4) cases were in the age group of 0-19 (4).
- From May 21 to June 17, 2023, there were 29 respiratory illness cases admitted to the ICU with lab-positive Covid19 (5), influenza (0), RSV (1), other respiratory illnesses (23) and co-infected cases (0). Among the 29 cases, Covid19 lab positives (5) cases were among the age groups of 0-19 (2) and ≥60 (3). For RSV lab positives (1) cases were among the age groups of 20-59 (1). For other respiratory lab positives (23) cases were in the age group of 0-19 (14), 20-59 (7) and ≥60 (2).
- ***Notes:***

[1] Because of the delay in date tested result, it affects the total number of Influenza (A/B), RSV and other respiratory virus admissions for a particular day. This lag in data impacts mostly the last couple of days from the day the report is updated. The counts for influenza, RSV, and other respiratory virus-associated hospital and ICU admissions refer to individuals with laboratory or point of care tests positive for influenza, RSV, and other respiratory viruses, respectively, occurring within four days before the admission date AND/OR at any point during the hospital stay. The counts for COVID-19 hospital and ICU admissions refer to individuals with laboratory tests positive for COVID-19 virus, occurring within 21 days before the admission date and/or at any point during the hospital stay or 7 days from the discharge. Episodes of care considers patients total movement within the health system related to their condition. It combines 2 or more admission from 2 or more different facilities, if they are transfers (No break in care). Transfer: Admission to any other hospital within 24 hours of discharge from previous hospital. Co-infected cases: positive for influenza and RSV or, positive for influenza and other respiratory virus or positive for RSV and other respiratory viruses or, positive for COVID-19 and influenza or, positive for COVID-19 and RSV or, Positive for COVID-19 and other resp viruses. Other includes: Parainfluenza 1-4, Adenovirus, Enterovirus, Human Metapneumovirus, Rhinovirus, Seasonal Coronovirus (O43, NL63, 229E, HKU1f.)

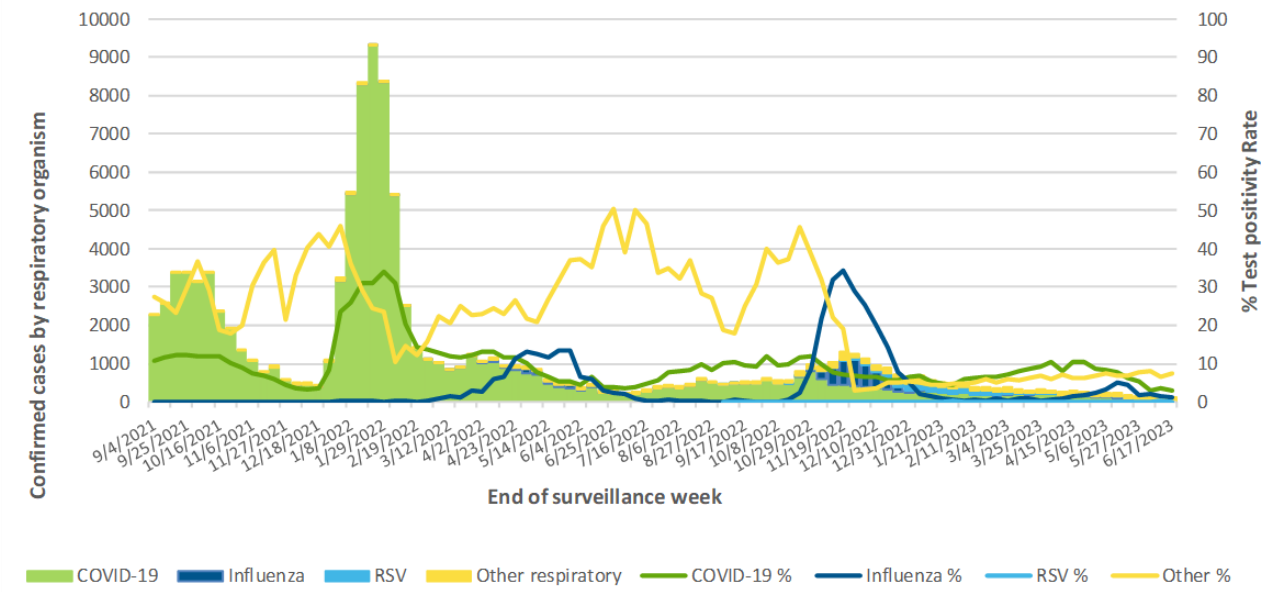
[2]7-day average of percentage of acute inpatient beds staffed and in operation that are occupied by COVID-positive patients as of 8AM census

[3] Includes deaths entered into Panorama IOM among lab-confirmed cases. Deaths reported based on the actual date of death. Deaths reported in previous periods subject to change due death reporting data lags

[4]Up-to-date =completed a primary series and at least one additional booster, age 5+ years.

[5]Up-to-date = received a vaccination within the current influenza season, age 6 months+. The most recent rate is as of February 28, 2023. This column will be updated at month end. See Technical Notes for details.

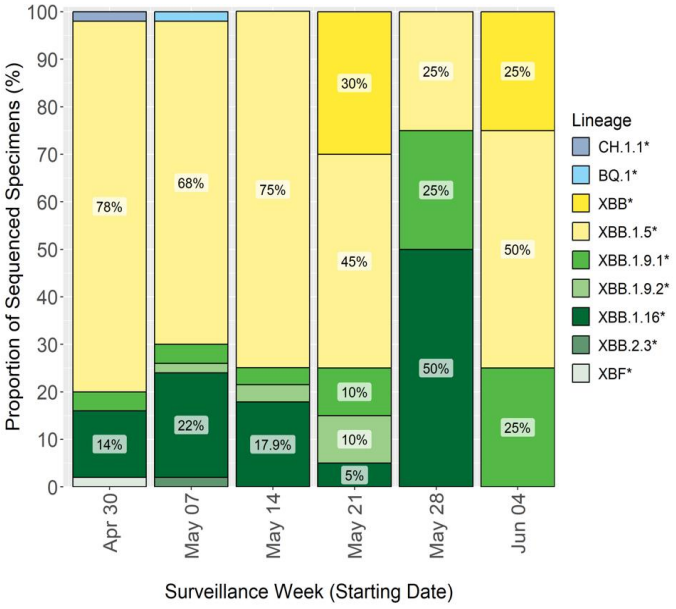
Figure 1: Epidemic curve, respiratory illness by organism and test positivity, August 29, 2021 – June 17, 2023



Data sources: Panorama IOM extracted on June 19, 2023 (COVID-19 cases)
Respiratory Virus Detections Surveillance System (influenza and other respiratory) (RRPL extracted June 19, 2023)
As of September 4, 2022, COVID-19 cases include new and reinfections.

For the four weeks of May 21 to June 17, 2023, there were:
154 COVID-19 cases (27 were 0 to 19 years; 41 were 20 to 59 years; and 86 were 60 years and older).
- *38 influenza lab detections*
- *One RSV detections*
- *317 other viral lab detections (parainfluenza, adenovirus, human metapneumovirus, rhinovirus, coronavirus)*

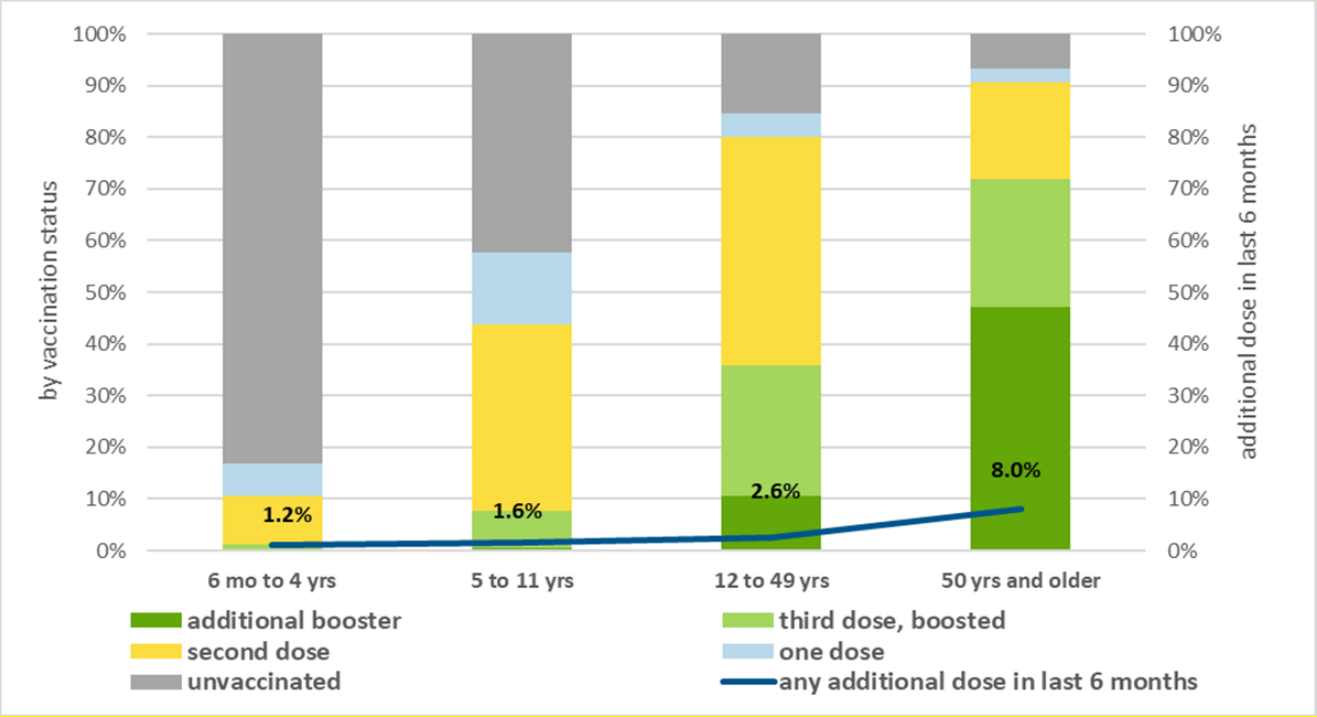
Figure 2: Percentage of SARS-CoV-2 variants by surveillance week starting*, April 30, 2023 – Jun 04, 2023



Lineage	Apr 30	May 07	May 14	May 21	May 28	Jun 04
CH.1.1*	1	0	0	0	0	0
BQ.1*	0	1	0	0	0	0
XBB*	0	0	0	6	0	1
XBB.1.5*	39	34	21	9	2	2
XBB.1.9.1*	2	2	1	2	2	1
XBB.1.9.2*	0	1	1	2	0	0
XBB.1.16*	7	11	5	1	4	0
XBB.2.3*	0	1	0	0	0	0
XBF*	1	0	0	0	0	0
Total	50	50	28	20	8	4

Data Source: *Roy Romanow Provincial Laboratory, Saskatchewan Health Authority, as of June 20, 2023*
The most recent VOC data available from the Provincial database is as of surveillance week ending June 10, 2023
* Surveillance week correspond to specimen collection date.

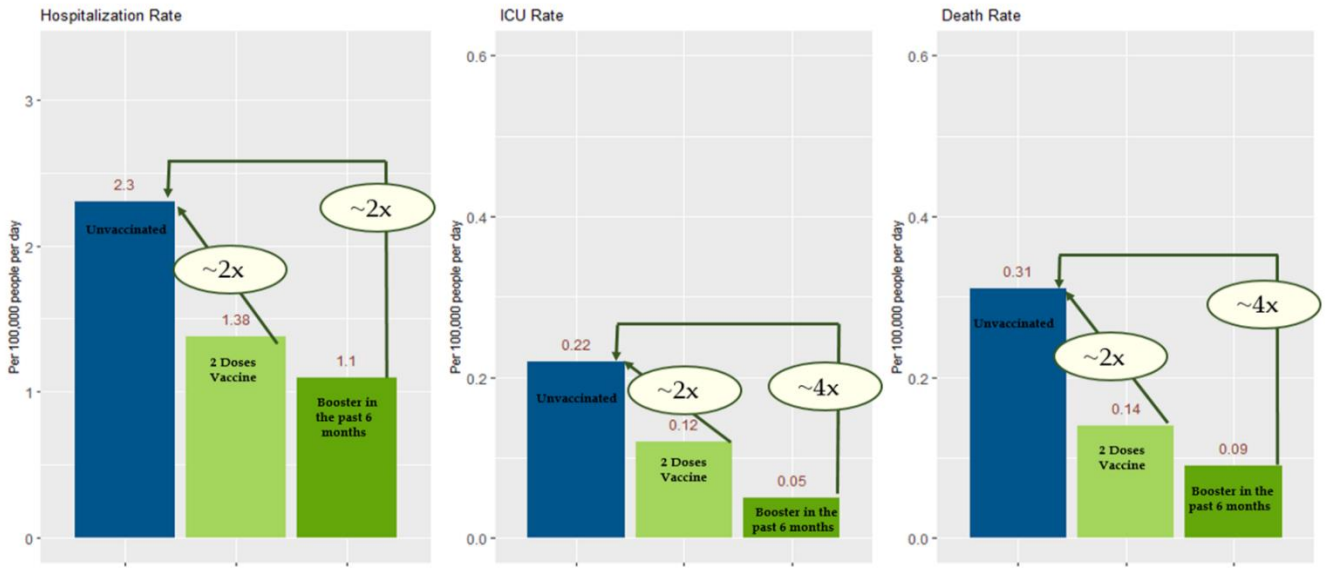
Figure 3: Proportion of residents by age group and COVID-19 vaccination status to June 17, 2023



Data sources: Panorama June 19, 2023; Saskatchewan Covered Population, 12-Nov-2022, Ministry of Health version (2022 Version 2)

Note: Of those five years and older: 46.3% have completed their series and received a booster dose; 4.5% have received their latest dose in the last six months. Of those 12 years and older, 21.4% (222,695) were administered a Moderna or a Pfizer bivalent. As of June 17, 2023, cumulatively doses administered are as follows: dose 1, n=996,420; dose 2, n=931,485; dose 3, n=535,747; completed plus 2 or more additional doses, n=402,114; total doses=2,865,766.

Figure 4: Booster dose within last 6 months reduces the risk of Hospitalization, ICU admission or Death (age-adjusted rates), October 01, 2022 – March 31, 2023



Data Source: *Digital Health Analytics, Saskatchewan Health Authority*

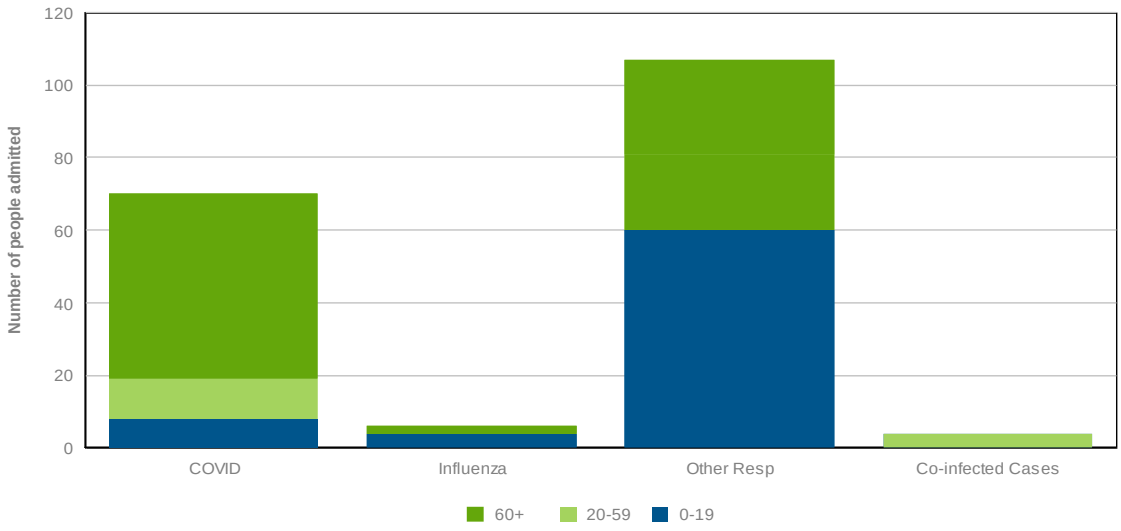
Definitions: *Unvaccinated - Individuals with no record of vaccine received or vaccinated with first dose but less than 21 days from receiving the first dose. Vaccinated with 2 doses - Individuals who have received their second dose for more than 14 days or their third dose is less than 14 days. Booster in the past 6 months - Individuals who have received any booster dose (3rd, 4th, 5th and so on) within the last 6 months. Details on methodology is provided in the Technical notes.*

Figure 5: The number of COVID-19, influenza, RSV, other respiratory viruses and co-infected cases admitted to hospital by week of the admission, May 21 – June 17, 2023*



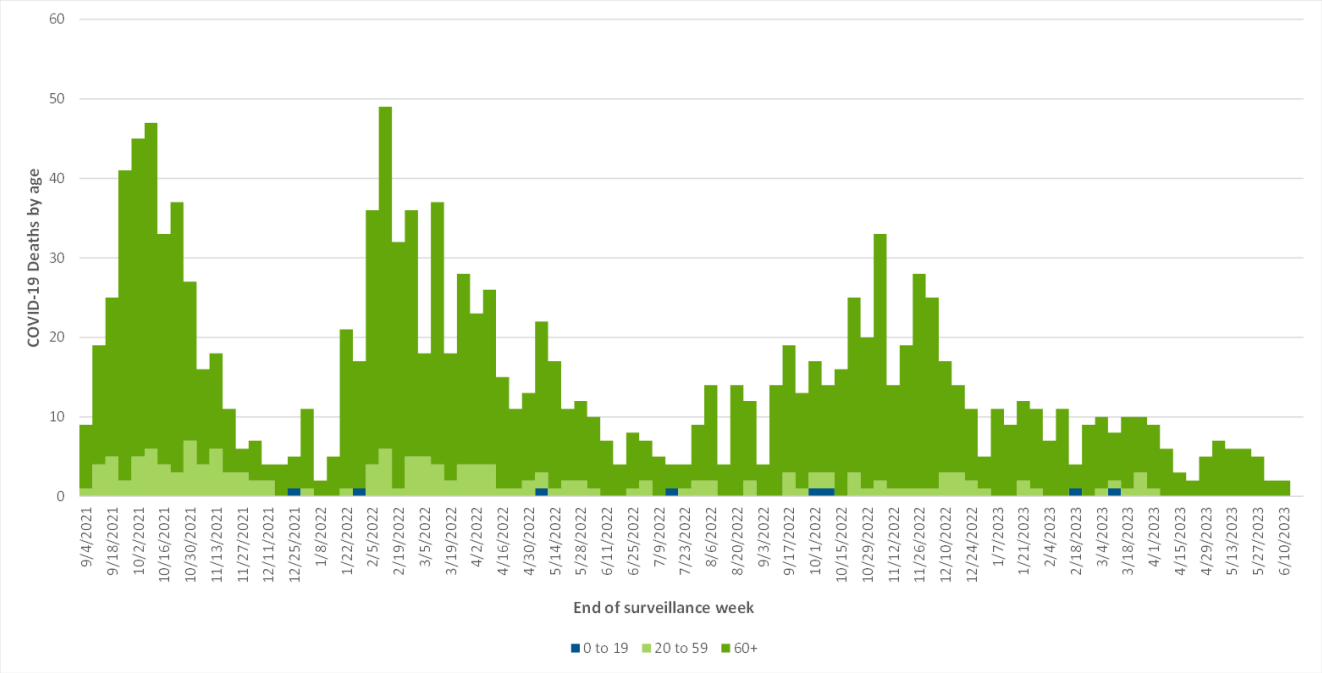
Data sources: *Digital Health Analytics, Saskatchewan Health Authority, Episode of Care methodology (Admission, Discharge, Transfer Database (ADT, RRPL, Panorama); data extracted on June 20, 2023. * Viral infection may not be the main reason for the admission.*
Note: *Because of the delay in date tested result, it affects the total number of COVID 19 admissions for a particular day. This lag in data impacts mostly the last couple of days from the day the report is updated. Includes lab or point of care positive for influenza, RSV, other respiratory viruses, four days prior to date of admission AND/OR at any point during admission. Episode of Care considers patients total movement within the health system related to their condition. It combines 2 or more admissions from 2 or more different facilities, if they are transferred (no break in care). Transfer = admission to any other hospital within 24 hours of discharge from previous hospital. Co-infected cases = positive for Influenza and RSV, or, Influenza and 'other', or, RSV and 'other', or, COVID-19 and Influenza, or, COVID-19 and RSV, or, COVID-19 and 'other'.*

Figure 6: The number of COVID-19, influenza, RSV, other respiratory viruses and co-infected cases admitted to hospital by age group, May 21 –June 17, 2023*



Data source: *Digital Health Analytics, Saskatchewan Health Authority, Episode of Care methodology (Admission, Discharge, Transfer Database (ADT, RRPL, Panorama); data extracted on June 20, 2023. * Viral infection may not be the main reason for the admission*
Note: *Because of the delay in date tested result, it affects the total number of COVID 19 admissions for a particular day. This lag in data impacts mostly the last couple of days from the day the report is updated. Includes lab or point of care positive for influenza, RSV, other respiratory viruses, four days prior to date of admission AND/OR at any point during admission. Episode of Care considers patients total movement within the health system related to their condition. It combines 2 or more admissions from 2 or more different facilities, if they are transferred (no break in care). Transfer = admission to any other hospital within 24 hours of discharge from previous hospital. Co-infected cases = positive for Influenza and RSV, or, Influenza and 'other', or, RSV and 'other', or, COVID-19 and Influenza, or, COVID-19 and RSV, or, COVID-19 and 'other'.*

Figure 7: COVID-19 deaths by age group and week, September 4, 2021 – June 17, 2023*



Data Source: Panorama June 19, 2023

In the past four weeks, May 21 to June 17, there have been nine deaths in COVD-19 cases, all in the 60 years or older group.

** Total COVID-19 deaths from March 2020 to date; n=1,995*

Table 5: Community Respiratory Infection Surveillance Program Indicators by zone, June 11 - 17, 2023

Location	Test positivity – COVID-19[1] (positive lab tests)	Test positivity – Influenza (positive lab tests)	RLI* visits to EDs per 1,000[2]	RLI* 811 calls per 1,000[3]	School illness absenteeism >=10%[4]	Wastewater indicator†	Proportion of population up-to-date vaccination – COVID-19[5]	Proportion of population immunized for Influenza (March 31, 2023)[6]
Far North West (Meadow Lake and area)	3.1% (1)	16.7% (3)	No data	-	1.8%	-	24.4%	11%
Far North Central	0.0% (0)	0.0% (0)	No data	-	0.0%	-	14.5%	4%
Far North East (La Ronge and area)	0.0% (0)	0.0% (0)	No data	-	4.3%	-	25.1%	9%
North West (North Battleford/ Lloydminster and area)	7.3% (8)	0.0% (0)	10.9	30.3	8.5%	No data	35.7%	19%
North Central (Prince Albert and area)	2.0% (1)	0.0% (0)	8.2	-	8.5%	No data	40.8%	22%
North East (Melfort and area)	6.3% (1)	0.0% (0)	25.5	58.7	8.5%	-	44.1%	26%
Saskatoon	3.0% (8)	2.6% (3)	21.0	52.0	9.9%	No data	49.5%	29%
Central West (Kindersley and area)	8.7% (2)	0.0% (0)	80.3	-	5.5%	-	44.1%	30%
Central East (Yorkton/Melville and area)	2.5% (2)	0.0% (0)	15.3	-	7.7%	High	45.9%	26%
Regina	1.8% (3)	0.0% (0)	12.6	37.3	8.7%	Moderate-high	52.1%	29%
South West (Swift Current/Maple Creek and area)	0.0% (0)	0.0% (0)	6.9	23.8	6.4%	High	41.0%	27%
South Central (Moose Jaw and area)	10.9% (5)	0.0% (0)	8.9	-	10.0%	Moderate-high	44.5%	27%
South East (Weyburn/Estevan and area)	0.0% (0)	0.0% (0)	23.8	51.1	10.2%	-	39.5%	24%
Unknown/Out of Province	1.8% (6)	0.0% (0)	No data	-	7.6%	-	-	-
SASKATCHEWAN	**3.1% (37)**	**1.2% (6)**	**16.7**	**46.5**	**8.7%**	**-**	**46.3%**	**27%**

*Notes[1]by week of lab detection; effective Oct 30, 2022 includes cases who tested positive more than once >= 90 days apart; ^[1]For COVID-19 test positivity, all tests reported were performed within the province. . This week's COVID-19 test positivity includes data from June 10 – June 16. *Respiratory-like illness; [2]Based on reports from ten of thirteen reporting areas. [3]811 data available at the six Integrated Service Areas geographical level; [4] Unknown represents the number of students who were absent from the class due to illness with no known geography for the school. School absenteeism is the proportion of scheduled children who were absent from the class due to illness. The type of illness is not specified.; †SK overall estimate is currently unavailable as this metric tends to overestimate and underestimate WW level due to varied patterns across regions, which is difficult to synchronize with the population size of each region.; Due to the extreme weather condition Regina, Yorkton, and Moose Jaw sample were delayed and were not included [5]Up-to-date = completed a primary series and at least one additional booster, age 5+ years; [6]received a vaccination within the current influenza season, age 6 months+; Does not include doses administered through NITHA or FNIHB, therefore some zones may underestimate coverage. Numbers in parenthesis represents positive lab tests.*

Technical Notes

1. Laboratory surveillance: Conducted through epidemiological analyses and Laboratory surveillance: Conducted through epidemiological analyses and positivity rate monitoring (counts and proportion of positive specimens, week of specimen collection, age category, geographical area, etiological type where applicable) of selected respiratory specimens submitted to the provincial laboratory in SK. Whole genome sequencing is conducted to detect changes (emergence of sub-lineages, variant proportion, etc) of clinical and public health importance among circulating respiratory organisms.

2. Sentinel health providers: Comprise a geographical-based network in practices across the province (n = 13 zones) who submit one to two specimens weekly to the Virology Section of the Roy Romanow Provincial Laboratory (RRPL), Saskatchewan Health Authority, from patients presenting with respiratory-like symptoms. Specimens are tested for a wider complement of respiratory organisms to monitor respiratory illness activity in the community. Assessment of co-infection (infected by more than one respiratory virus organism concurrently) occurs through sentinel provider submissions.

3. Wastewater data: Provided by the University of Saskatchewan and University of Regina Wastewater Team. Viral load for each zone was used to determine risk level (Low, Medium, Medium-High, High) using a four-bin system based on 100% of early Omicron peak reported. Locations sampled, includes: Saskatoon, Regina, Lumsden, North Battleford, Prince Albert, Yorkton, Swift Current, Moose Jaw, and Weyburn

4. Data collection from Emergency Departments (ED): Monitoring is done for a twenty-four hour period on at least one-week day (the exact time vary with the ED schedule). The ED reports to local public health services in their area on Wednesday afternoon and public health report to the Ministry of Health on Thursday each week. The count of Respiratory Like Illness (RLI) patients as a proportion of total ED admissions is captured.

5. ED admissions data is captured from hospitals in the province using a standard digital mechanism. Digital Health Services transforms visits for respiratory like illness to rates per 1000 visits for all causes. Hospitals in surveillance areas without this data capture mechanism report the data to the Ministry via local public health offices. This does not preclude monitoring in First Nations health care facilities.

6. HealthLine 811 callers with Respiratory Symptoms (RLI): This count of response protocols collected by HealthLine nurses specific to callers reporting respiratory-like symptoms. HealthLine data is collected for a seven day week, Monday to Sunday. Data is transformed into the rate of callers with respiratory symptoms from each Integrated Service Area (ISA) per 1000 calls from that ISA concerning any type of symptom.

7. A confirmed outbreak: Defined as two or more lab confirmed respiratory virus cases in high-risk settings where transmission is evident or there is a high level of suspicion of transmission. Outbreaks are reported by the week they were reported to the local public health office and not necessarily in the week that the outbreak began. For this report outbreaks in high risk settings comprise long term care facilities, personal care homes and group homes

8. COVID hospitalized admissions is the number of C-19 positive cases that during the surveillance week were admitted as an inpatient to an acute care facility. This includes patients with C-19 related illness, incidental COVID infection, and patients under investigation. COVID ICU admissions is the number of C-19 positive cases that during the surveillance week were admitted to an ICU location in SK. This includes both infectious and non-infectious cases.

9. Influenza, RSV and other respiratory virus admissions: Delays in testing results affect the total number of Influenza, RSV and other respiratory virus admissions for a particular day. This lag in data has the greatest impact on the two days prior to when the report is updated. Counts include individuals who are laboratory positive for influenza, RSV, and other respiratory viruses, within four days prior to date of admission AND/OR at any point during the hospital stay. Episode of Care considers patients' total movement within the health system related to their condition. It combines 2 or more admissions from 2 or more different facilities, if they are transfers (i.e., no break in care). Transfer: Admission to any other hospital within 24 hours of discharge from previous hospital. Co-infected Cases = if positive for Influenza and RSV or, positive for Influenza and Other Respiratory viruses or, positive for RSV and Other respiratory viruses or, positive for Covid-19 and Influenza or, positive for Covid-19 and RSV or, positive for Covid-19and Other Respiratory viruses.

10. Variant of concern (VOC): VOCs are SARS-CoV-2 viruses that have undergone genetic modification or mutation causing altered virus infectivity, replication and pathogenicity. As a result it can alter host immune response. The Roy Romanow Provincial Laboratory (RRPL) tests for and monitors COVID-19 variants of concern (VOCs) in Saskatchewan. Confirmation of VOC linages is done by conducting whole genome sequencing (WGS) at RRPL or the National Microbiology Laboratory. one to two weeks to complete WGS. Data sources for VOCs analysis include testing data from the RRPL, and epidemiological information from Panorama. Where geographical zone is missing in RRPL or Panorama data, the Saskatchewan postal code file is used to identify cases' geographical information.

    VOC lineages BA.1, BA.2, BA.2.75, CH.1.1, BA.5, BQ.1, BQ.1.1, XBB, XBB.1.5, XBB.1.9.1, XBB.1.9.2, XBB.1.16, XBB.2.3, and XBF are all classified under the WHO label of "Omicron". Lineages that are not explicitly indicated in the analysis are aggregated under their corresponding parent lineage. Percentages are shown when a lineage or variant group constitutes 5% or more of total specimens evaluated for a given surveillance week.

11. COVID-19 cases: Effective September 4, 2022,COVID-19 cases are based on lab detection and include cases who tested positive more than once 90 days, or further, apart. Prior to this, cases include, only, first time cases reported and entered into Panorama.

12. COVID-19 Deaths: Includes deaths entered into Panorama IOM among laboratory confirmed cases. Deaths are reported based on the actual date of death. Deaths in previous periods may be adjusted from previous reports due to data lag

13. COVID-19 Immunizations: Up-to-date (UTD) COVID-19 vaccination is the proportion of people having completed a primary series and one booster for ages five and older divided by the eligible population found in the Saskatchewan Covered Population, 12-Nov-2022 Ministry of Health version (2022 Version 2). Though vaccinated children six months to four years of age may be technically UTD, this specific definition does not apply to them. In addition, UTD in last six months is calculated by the proportion of people having received one or more boosters within the previous six months.

14. Influenza immunizations: UTD Influenza vaccination is the proportion of people, six months and older, having one influenza dose this season divided by the eligible population found in the Saskatchewan Covered Population, 12-Nov-2022 Ministry of Health version (2022 Version 2). Vaccination for the current influenza season officially began October 11, 2022. Some doses were administered prior to the start date.

15. Staffed Inpatient beds: Weekly average COVID Occupancy is a 7-Day average percentage of acute inpatient beds staffed and in operation COVID positive patients occupy. The full calculation of this metric is: Average COVID occupance=$\sum$(8am covid census) ÷ $\sum$(8am beds staffed and in operation) × 100%. Where "bed staffed and in operation = " Planned beds" + "Surge Beds" - "Closed" and $\sum$(…) indicates summation over 7-day period from Sunday to Saturday. 8am COVID census is taken from the ADT patient registration, which is fed to the provincial data-mart and archived hourly. 8am planned bed, surge beds, and closed beds is compiled via data feeds from APF (Saskatoon & Regina) and the provincial bed edits interface (INH &IRH).

16. Rate of COVID-19 hospitalization (ICU or Death) were calculated by summing the daily number of hospitalizations (ICUs or Deaths) for the period by vaccine status (numerator) divided by the mid period population by respective vaccine status (denominator), multiplied by 100,000. This estimate is further divided by the number of days to obtain the daily rate. Denominator for individuals in the Booster in the past 6-months group are all Saskatchewan residents who have had their booster dose within the last 6 months. To eliminate bias of age all rates are adjusted by age. Direct standardization method is employed using the Saskatchewan population as the standard population. Age at first dose used in the rate calculation. Individuals with unknown age are excluded from age-specific analyses. Estimates of relative risk (i.e. rate ratios) is obtained by comparing vaccinated with 2 doses (Any Booster dose) and unvaccinated. Risk estimates may differ from other reports due to differing methodologies. Relative risk estimates methodology is described elsewhere. See Namrata Bains. *Standardization of Rates* (March 2009).