

Childhood Immunization:

Coverage statistics for 2- and 7-year-old children

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<p>Purpose: This report provides a summary of childhood immunization coverage in Saskatchewan. Coverage statistics of children vaccinated by their second and seventh birthdays against pertussis, measles and meningococcal serogroup C disease for the recommended number of doses, according to the provincial routine childhood immunization schedules in the Saskatchewan Immunization Manual, are presented for the province, First Nations communities using Panorama, Athabasca Health Authority and the former health regions clustered by peer groups.</p> <p>Reporting Period: Jul 2021 - Jun 2022</p> <p>Data Source: Panorama (as of July 1, 2022)</p>	<h2>Executive Summary</h2> <p>The proportion of children immunized is an important indicator for population health and health system performance. When immunization coverage falls below a critical level, outbreaks may occur. The recommended coverage rate to prevent outbreaks of measles is about 95%.</p> <p>In Saskatchewan, the immunization coverage rates of three key antigens by the second and seventh birthdays, respectively, are:</p> <ul style="list-style-type: none"> • Pertussis: 73.4% and 73.4% • Measles: 73.3% and 87.5% • Meningococcal serogroup C disease: 85.6% and 90.5% <p>The percentage of two-year-old and seven-year-old children who were immunized with all three antigens was 71.8% and 73.1%, respectively.</p> <p>Provincial immunization coverage declined among two-year-old children for pertussis, measles, and meningococcal serogroup C compared with June 2021 (the differences being -3.0, -3.1 and -1.6, respectively).</p> <p>Provincial immunization coverage declined among seven-year-old children for pertussis, remained stable for measles and improved for meningococcal serogroup C compared with June 2021 (the differences being -0.3, 0.0 and 0.3, respectively).</p>
	<h2>Background</h2> <p>Immunization is a cost-effective preventive measure which has saved more lives than any other health measure.</p> <p>In Saskatchewan, immunization programs are primarily delivered by public health services.</p> <p>First Nations and Inuit Health Branch, Saskatchewan Region (FNIHB-SK) and the Northern Inter-Tribal Health Authority (NITHA) are responsible for providing immunizations to First Nations children living in First Nations communities. Data for 53 First Nations communities (FNIHB-SK and NITHA) are included in this report.</p> <p>Panorama includes information on the jurisdictional organization (JORG) responsible for delivering immunizations to a child registered in Panorama (e.g., a former health region, a NITHA community). The JORG often corresponds directly to a child's home community but not always. This report is based on the child's JORG, not where the vaccine was delivered. For example, if a girl with a JORG of the former Regina Qu'Appelle Health Region (fRQHR) is immunized in Saskatoon, she will be counted and reported under the fRQHR, not under the former Saskatoon Health Region.</p>
	<h2>Limitations</h2> <p>Vaccines delivered outside public health services (e.g., in an emergency department, a physician's office) may not be recorded in Panorama.</p> <p>There are 53 First Nations communities whose data are included in this report. Based on the 2021 Saskatchewan covered population report (Saskatchewan 2021 Covered Population, 08-Jul-2021 Ministry of Health SAS version (2021 version 1)), these 53 First Nations communities represent an estimated 71% of two-year-old children and 71% of seven-year-old children living in First Nations communities. Therefore, the coverage rates for these</p> <p>53 First Nations communities do not represent the entire First Nations population living in First Nations communities.</p> <p>This report includes only those children with Saskatchewan health coverage and registered in Panorama under a First Nations community described above, a former health region or Athabasca Health Authority (AHA) as of July 1, 2022. This means this report does not include coverage statistics for the entire provincial or jurisdictional populations.</p>

Immunization Coverage of 2-year-old Children

Pertussis:

- According to the Saskatchewan Immunization Manual, routine childhood immunization against pertussis is scheduled at ages 2, 4, 6 and 18 months, 4-6 years, and Grade 8. Therefore, children should have received four doses of pertussis antigen by their second birthday.
- The pertussis antigen is usually administered as DTaP-IPV-Hib (diphtheria, tetanus, acellular pertussis, inactivated polio, *Haemophilus influenzae* type b) vaccine. That is, children who received the pertussis antigen would normally also have received the other antigens of the multiple-antigen vaccine.
- To learn more about pertussis please visit: <http://www.saskatchewan.ca/residents/health/diseases-and-conditions/pertussis-whooping-cough>

Measles:

- According to the Saskatchewan Immunization Manual, routine childhood immunization against measles is scheduled at ages 12 and 18 months. Therefore, children should have received two doses of measles antigen by their second birthday.
- The measles antigen is usually administered as MMRV (measles, mumps, rubella, varicella) vaccine. This means that children who received the measles antigen would normally have received the other antigens of the multiple-antigen vaccine as well.
- To learn more about measles please visit: <http://www.saskatchewan.ca/residents/health/diseases-and-conditions/measles>

Meningococcal serogroup C disease:

- According to the Saskatchewan Immunization Manual, routine childhood immunization against meningococcal serogroup C disease is scheduled at age 12 months and serogroups A, C, W135 and Y at Grade 6. Therefore, children should have received one dose of meningococcal serogroup C vaccine by their second birthday.
- To learn more about meningococcal serogroup C and serogroups A, C, W135 and Y vaccines please visit: <https://www.saskatchewan.ca/residents/health/accessing-health-care-services/immunization-services>

Table 1: Number and percentage of children vaccinated for the recommended number of doses against pertussis, measles and meningococcal serogroup C disease by their **second birthday** in Saskatchewan, by AHA, former health region or First Nations communities using Panorama, as of June 30, 2022.

Jurisdiction (with former health region by peer group)	Number of Eligible Children in Panorama (a)	Number of Eligible Children Immunized (%) (b)		
		Pertussis (4 doses)	Measles (2 doses)	Meningococcal serogroup C (1 dose)
Saskatchewan	13,756	10,091 (73.4)	10,086 (73.3)	11,778 (85.6)
Saskatchewan Health Authority (c)	12,808	9,676 (75.5)	9,674 (75.5)	11,067 (86.4)
Peer Group A				
Regina Qu'Appelle	3,439	2,727 (79.3)	2,722 (79.2)	3,019 (87.8)
Saskatoon	4,384	3,391 (77.3)	3,378 (77.1)	3,886 (88.6)
Peer Group D				
Cypress	443	342 (77.2)	343 (77.4)	377 (85.1)
Five Hills	534	438 (82)	438 (82)	482 (90.3)
Heartland	448	344 (76.8)	346 (77.2)	381 (85)
Kelsey Trail	388	304 (78.4)	304 (78.4)	337 (86.9)
Sun Country	584	489 (83.7)	488 (83.6)	538 (92.1)
Sunrise	561	400 (71.3)	407 (72.5)	466 (83.1)
Peer Group F				
Athabasca Health Authority	27	17 (63)	16 (59.3)	25 (92.6)
Keewatin Yatthé	137	67 (48.9)	74 (54)	103 (75.2)
Mamawetan Churchill River	163	84 (51.5)	83 (50.9)	123 (75.5)
Peer Group H				
Prairie North	924	631 (68.3)	634 (68.6)	723 (78.2)
Prince Albert Parkland	803	459 (57.2)	457 (56.9)	632 (78.7)
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority				
First Nations communities using Panorama	921	398 (43.2)	396 (43)	686 (74.5)

- (a) The denominator is the number of children registered in Panorama who turned two years of age between July 1, 2021 and June 30, 2022; have Saskatchewan provincial health coverage; and are flagged as under a First Nations community using Panorama whose data are included here, AHA, or a former health region for public health services, as of July 1, 2022.
- (b) The numerator is the number of children from the denominator who received the recommended number of doses of the respective antigen by their second birthday.
- (c) Saskatchewan Health Authority data do not include data from AHA and First Nations communities.

- In Saskatchewan, there were 13,756 children aged two years registered in Panorama with provincial health coverage and whose public health jurisdiction was flagged with a First Nations community using Panorama whose data are included here, AHA, or a former health region (HR) as of July 1, 2022.
- The percentages of eligible children in Panorama who received the recommended number of doses of pertussis, measles and meningococcal serogroup C vaccines by their second birthday were 73.4%, 73.3% and 85.6%, respectively. Overall 71.8% of children received the recommended number of doses for all three agents by age two years.
- In Peer Group A, the immunization coverage rates were higher in the former Regina Qu'Appelle HR than the former Saskatoon HR for pertussis and measles. Vaccine coverage rates in this peer group were above the provincial average. Both former health regions in this peer group experienced lower coverage for all three antigens compared with June 2021.
- In Peer Group D, the former Sunrise HR reported immunization coverage below the provincial average for all three antigens. The former Five Hills, Kelsey Trail and Sun Country HRs in this peer group had coverage rates higher than the provincial average. With the exception of former Heartland and Sunrise, all of the former health regions in this peer group reported lower coverage rates compared with June 2021.
- In Peer Group F, the Athabasca Health Authority (AHA) reported coverage rate higher than the province for meningococcal serogroup C. All other coverage rates in this peer group were lower than the province. With the exception of coverage rate for measles in the former Keewatin Yatthé HR, immunization rates dropped in this Peer Group compared with June 2021. AHA reported a drop of measles coverage rate by more than 16 percentage points and the former Mamawetan Churchill River HR reported a drop of meningococcal serogroup C coverage rate by over 13 percentage points compared with June 2021.
- In Peer Group H, the immunization coverage rates were below the provincial coverage rates for all three antigens. Immunization coverage rates were higher in the former Prairie North HR than those in the former Prince Albert Parkland HR for pertussis and measles. With the exception of measles in the former Prairie North HR, both former health regions reported lower immunization coverage for all three antigens compared with June 2021.
- The immunization coverage in the First Nations communities included in this report was lower than provincial average for all three antigens and between 5 and 10 percentage points lower compared to June 2021. However, these rates do not represent all First Nations children living in First Nations communities.

Immunization Coverage of 7-year-old Children

Pertussis:

- According to the Saskatchewan Immunization Manual, routine childhood immunization against pertussis is scheduled at ages 2, 4, 6 and 18 months, 4-6 years, and Grade 8. Therefore, children should have received five doses of pertussis by their seventh birthday.
- The pertussis antigen is usually administered as DTaP-IPV-Hib (diphtheria, tetanus, acellular pertussis, inactivated polio, *Haemophilus influenzae* type b) vaccine. That is, children who received the pertussis antigen would normally also have received the other antigens of the multiple-antigen vaccine.
- To learn more about pertussis please visit: <http://www.saskatchewan.ca/residents/health/diseases-and-conditions/pertussis-whooping-cough>

Measles:

- According to the Saskatchewan Immunization Manual, routine childhood immunization against measles is scheduled at ages 12 and 18 months. Therefore, children should have received two doses of measles antigen by their seventh birthday.
- The measles antigen is usually administered as MMRV (measles, mumps, rubella, varicella) vaccine. This means that children who received the measles antigen would normally have received the other antigens of the multiple-antigen vaccine as well.
- To learn more about measles please visit: <http://www.saskatchewan.ca/residents/health/diseases-and-conditions/measles>

Meningococcal serogroup C disease:

- According to the Saskatchewan Immunization Manual, routine childhood immunization against meningococcal serogroup C disease is scheduled at age 12 months and serogroups A, C, W135 and Y at Grade 6. Therefore, children should have received one dose of meningococcal serogroup C vaccine by their seventh birthday.
- To learn more about meningococcal serogroup C and serogroups A, C, W135 and Y vaccines please visit: <https://www.saskatchewan.ca/residents/health/accessing-health-care-services/immunization-services>

Table 2: Number and percentage of children vaccinated for the recommended number of doses against pertussis, measles and meningococcal serogroup C disease by their **seventh birthday** in Saskatchewan by AHA, former health region or First Nations communities using Panorama, as of June 30, 2022.

Jurisdiction (with former health region by peer group)	Number of Eligible Children in Panorama (d)	Number of Eligible Children Immunized (%) (e)		
		Pertussis (5 doses)	Measles (2 doses)	Meningococcal serogroup C (1 dose)
Saskatchewan	16,492	12,111 (73.4)	14,426 (87.5)	14,922 (90.5)
Saskatchewan Health Authority (f)	15,472	11,438 (73.9)	13,496 (87.2)	13,953 (90.2)
Peer Group A				
Regina Qu'Appelle	4,198	3,084 (73.5)	3,640 (86.7)	3,760 (89.6)
Saskatoon	5,512	3,726 (67.6)	4,682 (84.9)	4,887 (88.7)
Peer Group D				
Cypress	553	478 (86.4)	507 (91.7)	517 (93.5)
Five Hills	631	536 (84.9)	584 (92.6)	598 (94.8)
Heartland	541	463 (85.6)	492 (90.9)	493 (91.1)
Kelsey Trail	422	373 (88.4)	399 (94.5)	402 (95.3)
Sun Country	750	667 (88.9)	699 (93.2)	705 (94)
Sunrise	611	468 (76.6)	535 (87.6)	550 (90)
Peer Group F				
Athabasca Health Authority	25	18 (72)	23 (92)	25 (100)
Keewatin Yatthé	166	121 (72.9)	147 (88.6)	152 (91.6)
Mamawetan Churchill River	140	118 (84.3)	134 (95.7)	133 (95)
Peer Group H				
Prairie North	1,100	784 (71.3)	933 (84.8)	977 (88.8)
Prince Albert Parkland	848	620 (73.1)	744 (87.7)	779 (91.9)
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority				
First Nations communities using Panorama	995	655 (65.8)	907 (91.2)	944 (94.9)

- (d) The denominator is the number of children registered in Panorama who turned seven years of age between July 1, 2021 and June 30, 2022, have Saskatchewan provincial health coverage, and are flagged as under a First Nations community using Panorama whose data are included here, AHA, or a former health region for public health services, as of July 1, 2022.
- (e) The numerator includes children from the denominator who received the recommended number of doses of the respective antigen by their seventh birthday.
- (f) Saskatchewan Health Authority data do not include data from AHA and First Nations communities.

- A total of 16,492 children aged seven years were registered in Panorama with provincial health coverage and whose public health jurisdiction was flagged with a First Nations community using Panorama and whose data are included here, AHA, or a former HR as of July 1, 2022.
- Of these, 73.4% received five doses of pertussis, 87.5% received two doses of measles and 90.5% received one dose of meningococcal serogroup C vaccine by their seventh birthday. Overall, 73.1% received recommended number of doses for all three agents by age seven years.
- In Peer Group A, immunization coverage was higher in the former Regina Qu'Appelle HR than in the former Saskatoon HR for all three antigens. With the exception of pertussis in the former Regina Qu'Appelle HR, coverage rates in this Peer Group were below the provincial coverage. Immunization coverage in the former Regina Qu'Appelle HR either dropped or remained stable compared with June 2021 but the former Saskatoon HR reported improved coverage rates for all three antigens.
- With the exception of meningococcal serogroup C in the former Sunrise HR, coverage rates in Peer Group D were above the provincial coverage rates for all three antigens. The former Five Hills and Kelsey Trail HRs reported improved immunization coverage for all antigens compared with June 2021 while the former Heartland and Sun Country HRs reported a drop in coverage for all three antigens.
- With the exception of pertussis in AHA and the former Keewatin Yatthé HR, Peer Group F experienced coverage rates above the provincial average.
- In Peer Group H, coverage in the former Prairie North HR was lower than those reported provincially. Coverage rates were higher in the former Prince Albert Parkland HR than in the former Prairie North HR for all three antigens. Coverage rates in the former Prince Albert Parkland HR saw a drop compared to June 2021 for all three antigens.
- Coverage rates in the First Nations communities included in this report were higher than the provincial coverage rates for measles and meningococcal serogroup C but lower for pertussis. Coverage in the First Nations communities saw decline for all three antigens compared to June 2021. However, these rates do not represent all First Nations children living in First Nations communities.
- It is noteworthy that children require two doses of measles and one dose of meningococcal serogroup C by both their second and seventh birthdays. Therefore, the percentage of children immunized against measles and meningococcal serogroup C will be higher at age seven than at two years because of the longer time window that allows for those who are behind in their immunization schedule to catch up. There is also a greater opportunity for contact with public health by children attending school.

Technical Notes

Panorama:

- Panorama is a comprehensive, integrated public health information system. Of the five modules in the system, four have been implemented: vaccine inventory, immunization, and investigation and outbreak management. When fully functional, it will help public health professionals work together to effectively manage vaccine inventories, immunizations, investigations, outbreaks and family health.
- The system is managed by the Saskatchewan Ministry of Health and eHealth Saskatchewan.
- Panorama’s immunization module captures information on vaccine events, including vaccine type, date administered and service provider.
- Vaccination records are usually entered in the system at the point of service.
- Panorama’s immunization module replaced the former Saskatchewan Immunization Management System (SIMS), on January 27, 2015. SIMS had been used province-wide since 2001.
- To learn more, please visit: www.ehealthsask.ca/services/panorama/Pages/default.aspx

Related links:

1. Routine childhood immunization schedules, Saskatchewan Ministry of Health: <http://www.saskatchewan.ca/residents/health/accessing-health-care-services/immunization-services#when-to-get-immunized>

Data and Methods:

- Immunization data for the children who turned two and seven years between July 1, 2021 and June 30, 2022 were extracted from the Panorama database as of July 1, 2022. Only children with Saskatchewan health coverage and flagged under AHA, a former health region jurisdiction or a First Nations community using Panorama (53 included in this report), at the date of data extraction were included.
- For coverage of two-year-old children, immunization histories for children born between July 2019 and June 2020 were followed for up to two years.
- For coverage of seven-year-old children, immunization histories for children born between July 2014 and June 2015 were followed for up to seven years.
- The Childhood Immunization: Coverage statistics for 2- and 7-year-old children, June 2021 report was used for comparison in this report.
- The number and percentage of children vaccinated by selected antigen for the recommended number of doses (according to the Saskatchewan Immunization Manual) were reported. The percentage of the children covered by a given antigen is calculated by taking the ratio of the children vaccinated to the total number of children registered in Panorama and multiplying by 100.
- First Nations analysis is included in collaboration with First Nations and Inuit Health Branch, Saskatchewan Region and the Northern Inter-Tribal Health Authority.

Peer Group:

A peer group consists of health authorities with similar socio-economic characteristics. Statistics Canada grouped health authorities into peer groups so that important differences may be detected by comparing them within a peer group. Athabasca Health Authority and the twelve former Saskatchewan health authorities fall into four of the ten peer groups (identified by letters A through J) across Canada (Table 3).

Peer groupings used in this report are based on Statistics Canada 2011 peer groupings and should not be compared with the current Statistics Canada peer groupings (2018).

Interpretation caveats:

Early in 2021 eHealth Saskatchewan (eHS) augmented the Panorama client file by adding clients from the shared client index (SCI) who were not previously registered in Panorama. This was done over several months in a staged process with older clients added first. The purpose was to support and speed up entry of COVID-19 immunization records. As a result the Panorama client file is now larger than it was in previous years. This affects the denominators used in % coverage calculations. Because the vaccine preventable disease (VPD) reports, the childhood immunization quarterly reports, and the monthly accountability reports use clients registered in Panorama as the denominator, comparing coverage rates over time should be interpreted with caution. Changes from one time period to another be an artifact of the change to the client file.

Table 3: Principal characteristics of peer groups in Saskatchewan (based on 2011 boundaries of the 12 former health regions and one health authority and 2006 Census data).

Peer Group	Former Health Region	Principal characteristics
A	Regina Qu’Appelle, Saskatoon	<ul style="list-style-type: none"> • Urban-rural mix • Average percentage of aboriginal population • Average percentage of immigrant population
D	Cypress, Five Hills, Heartland, Kelsey Trail, Sun Country, Sunrise	<ul style="list-style-type: none"> • Mainly rural regions • Average percentage of aboriginal population • High employment rate
F	Athabasca Health Authority, Keewatin Yatthé, Mamawetan Churchill River	<ul style="list-style-type: none"> • Northern and remote regions • Very high proportion of aboriginal population • Very low employment rate • Low proportion of immigrants
H	Prairie North, Prince Albert Parkland	<ul style="list-style-type: none"> • Rural northern regions • High proportion of aboriginal population • Low proportion of immigrants

Source: Peer Group, Statistics Canada: <http://www.statcan.gc.ca/pub/82-221-x/2011002/hrpg-eng.htm>

Appendix

Table 4: Coverage rate difference of **2-year-old children** immunized for the recommended number of doses against pertussis (four doses), measles (two doses) and meningococcal serogroup C (one dose) between this report (June 2022) and the June 2021 childhood immunization coverage report, Childhood Immunization: Coverage statistics for 2- and 7-year-old children.

Jurisdiction (with former health region by peer group)	Pertussis		Measles		Meningococcal serogroup C	
	June, 2021	Difference	June, 2021	Difference	June, 2021	Difference
Saskatchewan	76.4	-3	76.4	-3.1	87.2	-1.6
Saskatchewan Health Authority	78.1	-2.6	78	-2.5	87.8	-1.4
Peer Group A						
Regina Qu'Appelle	81.4	-2.1	81.1	-1.9	89.4	-1.6
Saskatoon	79.6	-2.3	79.6	-2.5	88.8	-0.2
Peer Group D						
Cypress	81	-3.8	80.4	-3	89.3	-4.2
Five Hills	84.1	-2.1	83.7	-1.7	91.7	-1.4
Heartland	77.8	-1	77.6	-0.4	84.7	0.3
Kelsey Trail	81.8	-3.4	82.3	-3.9	90.7	-3.8
Sun Country	89.6	-5.9	89.6	-6	93.3	-1.2
Sunrise	72.2	-0.9	72	0.5	82.2	0.9
Peer Group F						
Athabasca Health Authority	68.3	-5.3	75.6	-16.3	92.7	-0.1
Keewatin Yatthé	50.3	-1.4	50.3	3.7	80.7	-5.5
Mamawetan Churchill River	59.3	-7.8	59.3	-8.4	89.2	-13.7
Peer Group H						
Prairie North	69.1	-0.8	68.4	0.2	79.6	-1.4
Prince Albert Parkland	65.2	-8	65.6	-8.7	83.1	-4.4
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority						
First Nations communities using Panorama	52.1	-8.9	52.9	-9.9	79.3	-4.8

Table 5: Coverage rate difference of **7-year-old children** immunized for the recommended number of doses against pertussis (five doses), measles (two doses) and meningococcal serogroup C (one dose) between this report (June 2022) and the June 2021 childhood immunization coverage report, Childhood Immunization: Coverage statistics for 2- and 7-year-old children.

Jurisdiction (with former health region by peer group)	Pertussis		Measles		Meningococcal serogroup C	
	June, 2021	Difference	June, 2021	Difference	June, 2021	Difference
Saskatchewan	73.7	-0.3	87.5	0	90.2	0.3
Saskatchewan Health Authority	73.8	0.1	87.2	0	89.9	0.3
Peer Group A						
Regina Qu'Appelle	73.5	0	87.7	-1	90.8	-1.2
Saskatoon	67.1	0.5	83.6	1.3	87.4	1.3
Peer Group D						
Cypress	86.2	0.2	92.5	-0.8	93.6	-0.1
Five Hills	78.1	6.8	89.6	3	91.5	3.3
Heartland	85.7	-0.1	91.8	-0.9	92.2	-1.1
Kelsey Trail	86.4	2	92	2.5	91.8	3.5
Sun Country	90.4	-1.5	94	-0.8	94.5	-0.5
Sunrise	74.1	2.5	88.9	-1.3	89.8	0.2
Peer Group F						
Athabasca Health Authority	76.7	-4.7	83.3	8.7	96.7	3.3
Keewatin Yatthé	72.2	0.7	90.1	-1.5	92	-0.4
Mamawetan Churchill River	89	-4.7	94.8	0.9	95.5	-0.5
Peer Group H						
Prairie North	73.9	-2.6	84.7	0.1	87.6	1.2
Prince Albert Parkland	76.5	-3.4	90.1	-2.4	92.1	-0.2
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority						
First Nations communities using Panorama	71.8	-6	92.7	-1.5	95.8	-0.9