

Childhood Immunization: Coverage statistics for 2- and 7-year-old children

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<p>Purpose:</p> <p>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, are presented for the province, First Nations communities using Panorama, Athabasca Health Authority and the former health regions clustered by peer groups.</p>	<h2 style="text-align: center;">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. Recommended coverage rate to prevent outbreaks of measles is about 95%.</p> <p>In Saskatchewan, immunization coverage rates of three key antigens by the second and seventh birthdays, respectively, are:</p> <ul style="list-style-type: none"> • Pertussis: 82.7% and 75.4% • Measles: 82.8% and 90.5% • Meningococcal serogroup C disease: 91.3% and 93.2% <p>The percentage of two-year-old and seven-year-old children who were immunized with all three antigens was 80.8% and 75%, respectively.</p> <p>Provincial immunization coverage for pertussis, measles and meningococcal serogroup C disease increased for two-year-old children from September 2018 (the differences being 2.6, 2.9 and 0.9, respectively).</p> <p>Provincial immunization coverage for pertussis, measles and meningococcal serogroup C disease decreased for seven-year-old children from September 2018 (the differences being -0.7, -0.1 and -0.2, respectively).</p>
<p>Reporting Period:</p> <p>Oct 2018 – Sep 2019</p> <p>Data Source:</p> <p>Panorama (as of October 1, 2019)</p>	<h2 style="text-align: center;">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. Currently 29 First Nations communities (FNIHB-SK and NITHA) are using Panorama.</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 (RQHR) is immunized in Saskatoon, she will be counted and reported under the former RQHR, not under the former Saskatoon Health Region.</p>
	<h2 style="text-align: center;">Limitations</h2> <p>Vaccines delivered outside regional public health services (e.g., in an emergency department, a physician’s office) may not be recorded in Panorama.</p> <p>Twenty-nine of 82 First Nations communities are currently using Panorama. All the other First Nations communities are not using Panorama. Based on data from FNIHB-SK, the 29 First Nations communities using Panorama represent 41.2% of two-year-old children and 41.7% of seven-year-old children living in First Nations communities as of December 31, 2018. Therefore, the coverage rates for the 29 First Nations communities using Panorama 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 former health region, Athabasca Health Authority (AHA) or a First Nations community using Panorama as of October 1, 2019. This means this report does not include coverage statistics for the entire provincial or regional population.</p>

Immunization Coverage of 2-year-old Children

Pertussis:

- According to the SK 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 SK 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 SK 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 September 30, 2019.

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	14,516	12,003 (82.7)	12,013 (82.8)	13,256 (91.3)
Saskatchewan Health Authority (c)	13,886	11,584 (83.4)	11,592 (83.5)	12,688 (91.4)
Peer Group A				
Regina Qu'Appelle	3,724	3,096 (83.1)	3,100 (83.2)	3,386 (90.9)
Saskatoon	4,696	3,953 (84.2)	3,949 (84.1)	4,324 (92.1)
Peer Group D				
Cypress	511	454 (88.8)	460 (90)	477 (93.3)
Five Hills	583	504 (86.4)	498 (85.4)	539 (92.5)
Heartland	515	452 (87.8)	449 (87.2)	475 (92.2)
Kelsey Trail	370	340 (91.9)	346 (93.5)	357 (96.5)
Sun Country	652	620 (95.1)	621 (95.2)	627 (96.2)
Sunrise	605	470 (77.7)	464 (76.7)	524 (86.6)
Peer Group F				
Athabasca Health Authority	25	23 (92)	22 (88)	23 (92)
Keewatin Yatthé	159	111 (69.8)	109 (68.6)	142 (89.3)
Mamawetan Churchill River	170	154 (90.6)	157 (92.4)	170 (100)
Peer Group H				
Prairie North	1,048	807 (77)	807 (77)	920 (87.8)
Prince Albert Parkland	853	623 (73)	632 (74.1)	747 (87.6)
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority				
First Nations communities using Panorama	605	396 (65.5)	399 (66)	545 (90.1)

- The denominator is the number of children registered in Panorama who turned two years of age between October 1, 2018 and September 30, 2019; have Saskatchewan provincial health coverage; and are flagged as under AHA, a former health region or a First Nations community using Panorama, for public health services, as of October 1, 2019.
- 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.
- Saskatchewan Health Authority data do not include the data from AHA and First Nations communities using Panorama.

- In Saskatchewan, there were 14,516 children aged two years registered in Panorama with provincial health coverage and whose public health jurisdiction was flagged with AHA, a former health region (HR) or a First Nations community using Panorama, as of October 1, 2019. They represent approximately 92.3% of the children two years of age in the 2019 Saskatchewan Covered Population (15,719).
- 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 82.7%, 82.8% and 91.3%, respectively. Overall 80.8% of children received all three vaccine agents by age two years.
- In Peer Group A, the immunization coverage rates were higher in the former Saskatoon HR than in the former Regina Qu'Appelle HR for all three antigens. Vaccine coverage in the former Saskatoon HR was above the provincial average as well. The coverage rate for meningococcal serogroup C in the former Regina Qu'Appelle HR was below the provincial coverage rate. Both the former Regina Qu'Appelle and Saskatoon HRs experienced higher coverage rates for all three antigens compared to September 2018.
- With the exception of the former Sunrise HR, all former HRs in Peer Group D had coverage rates higher than the provincial average for all three antigens. The former Heartland and Sunrise HRs experienced a decline in coverage rates for all three antigens compared to September 2018. On the other hand, the former Cypress, Five Hills and Sun Country HRs reported improved immunization coverage for all three antigens compared to September 2018.
- In Peer Group F, the former Mamawetan Churchill River HR and AHA reported coverage rates higher than the province for all three antigens. The former Mamawetan Churchill River HR reports higher coverage rates than either AHA or the former Keewatin Yatthé HR for measles and meningococcal serogroup C. With the exception of measles in the former Keewatin Yatthé HR, coverage rates improved for all three antigens in AHA and the former HRs in this peer group compared to September 2018.
- In Peer Group H, the immunization coverage rates for all three antigens were higher in the former Prairie North HR than those in the former Prince Albert Parkland HR. The former Prairie North HR reported improved immunization coverage for all three antigens compared to September 2018 while the former Prince Albert Parkland HR experienced a decline in meningococcal serogroup C antigen coverage rate in the same time period.
- The immunization coverage in the First Nations communities using Panorama was lower than the provincial average for all three antigens. Immunization coverage within First Nations communities using Panorama declined for pertussis and measles compared to September 2018. 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 SK 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 SK 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 SK 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 September 30, 2019.

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	15,739	11,865 (75.4)	14,239 (90.5)	14,665 (93.2)
Saskatchewan Health Authority (f)	15,064	11,350 (75.3)	13,595 (90.2)	14,006 (93)
Peer Group A				
Regina Qu'Appelle	4,108	3,085 (75.1)	3,710 (90.3)	3,822 (93)
Saskatoon	5,202	3,612 (69.4)	4,547 (87.4)	4,753 (91.4)
Peer Group D				
Cypress	518	460 (88.8)	498 (96.1)	500 (96.5)
Five Hills	629	496 (78.9)	581 (92.4)	588 (93.5)
Heartland	542	463 (85.4)	516 (95.2)	521 (96.1)
Kelsey Trail	424	342 (80.7)	404 (95.3)	407 (96)
Sun Country	724	647 (89.4)	692 (95.6)	693 (95.7)
Sunrise	637	502 (78.8)	580 (91.1)	597 (93.7)
Peer Group F				
Athabasca Health Authority	30	26 (86.7)	29 (96.7)	29 (96.7)
Keewatin Yatthé	166	128 (77.1)	148 (89.2)	156 (94)
Mamawetan Churchill River	178	156 (87.6)	174 (97.8)	175 (98.3)
Peer Group H				
Prairie North	1,041	773 (74.3)	934 (89.7)	957 (91.9)
Prince Albert Parkland	895	686 (76.6)	811 (90.6)	837 (93.5)
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority				
First Nations communities using Panorama	645	489 (75.8)	615 (95.3)	630 (97.7)

- (d) The denominator is the number of children registered in Panorama who turned seven years of age between October 1, 2018 and September 30, 2019, have Saskatchewan provincial health coverage, and are flagged as under AHA, a former health region or a First Nations community using Panorama, for public health services, as of October 1, 2019.
- (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 the data from AHA and First Nations communities using Panorama.

- A total of 15,739 children aged seven years were registered in Panorama with provincial health coverage and whose public health jurisdiction was flagged with AHA, a former health region (HR) or a First Nations community using Panorama, as of October 1, 2019. They represent approximately 97.6% of the children seven years of age in the 2019 Saskatchewan Covered Population (16,120).
- Of these, 75.4% received five doses of pertussis, 90.5% received two doses of measles and 93.2% received one dose of meningococcal serogroup C vaccine by their seventh birthday. Overall, 75% received all three vaccine 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. The coverage rates in the former Regina Qu'Appelle and Saskatoon HRs were below the provincial coverage rates for all three antigens. Both the former Regina Qu'Appelle and Saskatoon HRs experienced lower coverage rates for all three antigens compared to September 2018.
- Coverage rates in all former health regions in Peer Group D were above the provincial coverage rates for all three antigens. The former Cypress, Heartland and Sunrise HRs experienced an improvement in coverage rates for all three antigens compared to September 2018. The former Five Hills and Sun Country HRs in this peer group saw a decline in coverage rates for meningococcal serogroup C and the former Kelsey Train HR saw a decline in coverage for pertussis compared to September 2018.
- With the exception of measles in the former Keewatin Yatthé HR, AHA and the former HRs (Keewatin Yatthé and Mamawetan Churchill River) experienced coverage rates above the provincial average for all three antigens in Peer Group F. AHA and the former Mamawetan Churchill River HR saw an improvement in coverage for all three antigens compared to September 2018 while the former Keewatin Yatthé experienced a decline in coverage for measles compared to 2018.
- In Peer Group H, the immunization coverage in the former Prince Albert Parkland HR was higher than those in the former Prairie North HR and the province for all three antigens. Both former health regions in this peer group experienced improvement in immunization coverage rates for all three antigens from September 2018.
- Coverage rates in the First Nations communities using Panorama were higher than the provincial coverage rates for all three antigens but the coverage rates for all three antigens declined compared to September 2018. However, these rates do not represent all First Nations children living in First Nations communities.
- Immunization coverage depends on the age of the children. For example, it is recommended that children receive two doses of measles and one dose of meningococcal serogroup C by their second birthday, as well as by their seventh birthday. Therefore, the percentage of children immunized against measles and meningococcal serogroup C will be higher when counted at age seven years because of the longer time window that allows for those who are behind in their immunization schedule to catch up and the greater opportunity for contact between public health and 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>
2. Covered Population Report, Saskatchewan Ministry Health: <https://opendata.ehealthsask.ca/MicroStrategyPublic/asp/Main.aspx>

Data and Methods:

- Immunization data for the children who turned two and seven years between October 1, 2018 and September 30, 2019 were extracted from the Panorama database as of October 1, 2019. Only children with Saskatchewan health coverage and flagged under AHA, a former health region jurisdiction or a First Nations community using Panorama, at the date of data extraction were included.
- For coverage of two-year-old children, immunization histories for children born between October 2016 and September 2017 were followed up to two years since birth.
- For coverage of seven-year-old children, immunization histories for children born between October 2011 and September 2012 were followed up to seven years since birth.
- The Childhood Immunization: Coverage statistics for 2- and 7-year-old children, September 2018 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 Ministry of Health Routine Immunization Schedules) 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 is multiplied by 100.

- Population counts from the Saskatchewan Ministry of Health Covered Population Reports can be used to determine the percentage of children aged two and seven years included in this report. The covered population reports include all children with provincial health coverage as of June 30 of the particular year (e.g., 2018, 2017).
- 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 AHA and former health regions with similar socio-economic characteristics. Statistics Canada grouped health regions into peer groups so that important differences may be detected by comparing them within a peer group. The twelve former health regions and one health authority in Saskatchewan 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 to the current Statistics Canada peer groupings (2014).

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 (September 2019) and the September 2018 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	
	September 2018	Difference	September 2018	Difference	September 2018	Difference
Saskatchewan	80.1	2.6	79.9	2.9	90.4	0.9
Saskatchewan Health Authority	80.6	2.8	80.3	3.2	90.4	1
Peer Group A						
Regina Qu'Appelle	78.8	4.3	77.9	5.3	88.4	2.5
Saskatoon	81.8	2.4	81.7	2.4	91.2	0.9
Peer Group D						
Cypress	86.5	2.3	85.4	4.6	92.9	0.4
Five Hills	82.7	3.7	82.2	3.2	91.5	1
Heartland	88.5	-0.7	89.1	-1.9	93.4	-1.2
Kelsey Trail	92.7	-0.8	93.2	0.3	96.5	0
Sun Country	90.7	4.4	91	4.2	94.1	2.1
Sunrise	82.9	-5.2	81.5	-4.8	91	-4.4
Peer Group F						
Athabasca Health Authority	69	23	71.4	16.6	90.5	1.5
Keewatin Yatthé	64.1	5.7	70.3	-1.7	89	0.3
Mamawetan Churchill River	83.1	7.5	84.4	8	96.8	3.2
Peer Group H						
Prairie North	74.4	2.6	73.2	3.8	87.2	0.6
Prince Albert Parkland	68.6	4.4	69.1	5	88.4	-0.8
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority						
First Nations communities using Panorama	65.9	-0.4	68.6	-2.6	88.6	1.5

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 (September 2019) and the September 2018 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	
	September 2018	Difference	September 2018	Difference	September 2018	Difference
Saskatchewan	76.1	-0.7	90.6	-0.1	93.4	-0.2
Saskatchewan Health Authority	76.1	-0.8	90.4	-0.2	93.2	-0.2
Peer Group A						
Regina Qu'Appelle	76.6	-1.5	91.4	-1.1	94.4	-1.4
Saskatoon	72.6	-3.2	88.8	-1.4	91.9	-0.5
Peer Group D						
Cypress	85.6	3.2	93.5	2.6	95.3	1.2
Five Hills	78.8	0.1	91.6	0.8	94.9	-1.4
Heartland	84.7	0.7	94.4	0.8	96	0.1
Kelsey Trail	82.2	-1.5	94.8	0.5	95.4	0.6
Sun Country	89.2	0.2	95.2	0.4	96.1	-0.4
Sunrise	76.2	2.6	89.8	1.3	92.8	0.9
Peer Group F						
Athabasca Health Authority	82.8	3.9	93.1	3.6	93.1	3.6
Keewatin Yatthé	75.6	1.5	90.9	-1.7	92.9	1.1
Mamawetan Churchill River	69.9	17.7	94.1	3.7	96.8	1.5
Peer Group H						
Prairie North	71	3.3	86	3.7	89.4	2.5
Prince Albert Parkland	73.3	3.3	88.9	1.7	91.7	1.8
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority						
First Nations communities using Panorama	76.3	-0.5	95.5	-0.2	98.1	-0.4