

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

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<p>Purpose:</p> <p>This report provides 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>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 rates to prevent outbreaks of pertussis and measles are 92-94% and 83-94%, respectively.</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: 80.5% and 76% • Measles: 80.5% and 90.6% • Meningococcal serogroup C disease: 90.2% and 93.4% <p>The percentage of two-year-old and seven-year-old children who were immunized with all three antigens was 78.5% and 75.6%, respectively.</p> <p>Immunization coverage rate differences from December 2017 are not reported for Saskatchewan, the Saskatchewan Health Authority and First Nations communities using Panorama because December 2017 rates for these jurisdictions either do not include First Nations communities using Panorama or are not available.</p>
<p>Reporting Period:</p> <p>Jan 2018 - Dec 2018</p> <p>Data Source:</p> <p>Panorama (as of January 1, 2019)</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 regional 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 twenty-six 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>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-six 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 26 First Nations communities using Panorama represent 34.2% of two-year-old children and 32.3% of seven-year-old children living in First Nations communities as of December 31, 2017. Therefore, the coverage rates for the 26 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 January 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 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 vaccine please visit: <http://www.saskatchewan.ca/government/news-and-media/2004/september/27/meningococcal-immunization-to-start-october-1st>

Data Source:

Panorama (as of January 1, 2019)

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 December 31, 2018.

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	14,441	11,630 (80.5)	11,621 (80.5)	13,020 (90.2)
Saskatchewan Health Authority (c)	13,951	11,305 (81)	11,283 (80.9)	12,587 (90.2)
Peer Group A				
Regina Qu'Appelle	3,836	3,037 (79.2)	3,019 (78.7)	3,391 (88.4)
Saskatoon	4,732	3,878 (82)	3,878 (82)	4,310 (91.1)
Peer Group D				
Cypress	486	411 (84.6)	415 (85.4)	448 (92.2)
Five Hills	600	502 (83.7)	502 (83.7)	550 (91.7)
Heartland	485	426 (87.8)	429 (88.5)	448 (92.4)
Kelsey Trail	377	347 (92)	350 (92.8)	360 (95.5)
Sun Country	691	638 (92.3)	640 (92.6)	655 (94.8)
Sunrise	565	470 (83.2)	459 (81.2)	511 (90.4)
Peer Group F				
Athabasca Health Authority	35	25 (71.4)	28 (80)	33 (94.3)
Keewatin Yatthé	159	100 (62.9)	105 (66)	141 (88.7)
Mamawetan Churchill River	159	134 (84.3)	137 (86.2)	155 (97.5)
Peer Group H				
Prairie North	1,037	783 (75.5)	769 (74.2)	899 (86.7)
Prince Albert Parkland	824	579 (70.3)	580 (70.4)	719 (87.3)
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority				
First Nations communities using Panorama	455	300 (65.9)	310 (68.1)	400 (87.9)

- The denominator is the number of children registered in Panorama who turned two years of age between January 1, 2018 and December 31, 2018, 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 January 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 14,441 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 January 1, 2019. They represent approximately 90.5% of the children two years of age in the 2017 Saskatchewan Covered Population (total number of two-year-old children with provincial health coverage as of June 30, 2017 was 15,960).
- 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 80.5%, 80.5% and 90.2%, respectively. Overall 78.5% 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 rates in the former Regina Qu'Appelle HR were below the provincial coverage rates for all three antigens. Both the former Regina Qu'Appelle HR and the former Saskatoon HR experienced higher coverage rates for all three antigens compared to December 2017.
- All the former health regions in Peer Group D had coverage rates higher than the provincial average for all three antigens. With the exception of the former Cypress HR and the former Sunrise HR, all former health regions in this peer group experienced a decline in coverage for meningococcal serogroup C since December 2017. The former Sunrise HR also saw a decline in measles coverage rates since December 2017. The former Cypress HR saw an improvement for all three antigens during the same time period.
- In Peer Group F, the former Mamawetan Churchill River HR reports rates higher than the province for all three antigens and AHA reports higher than provincial coverage for meningococcal serogroup C. The former Mamawetan Churchill River HR reports higher coverage rates than either AHA or the former Keewatin Yatthé HR for all three antigens. With the exception of meningococcal serogroup C in AHA, coverage rates improved for all three antigens compared to December 2017 in this peer group.
- In Peer Group H, the immunization coverage rates for pertussis and measles were higher in the former Prairie North HR than those in the former Prince Albert Parkland HR. Both the former HRs in this peer group experienced improved immunization coverage for all three antigens compared to December 2017.
- The immunization coverage in the First Nations communities using Panorama was lower than the provincial average for all three antigens. 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 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 vaccine please visit: <http://www.saskatchewan.ca/government/news-and-media/2004/september/27/meningococcal-immunization-to-start-october-1st>

Data Source:

Panorama (as of January 1, 2019)

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 December 31, 2018.

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	15,337	11,651 (76)	13,890 (90.6)	14,319 (93.4)
Saskatchewan Health Authority (f)	14,840	11,249 (75.8)	13,412 (90.4)	13,832 (93.2)
Peer Group A				
Regina Qu'Appelle	3,930	2,986 (76)	3,577 (91)	3,694 (94)
Saskatoon	4,962	3,558 (71.7)	4,389 (88.5)	4,558 (91.9)
Peer Group D				
Cypress	525	452 (86.1)	492 (93.7)	498 (94.9)
Five Hills	713	547 (76.7)	642 (90)	669 (93.8)
Heartland	544	453 (83.3)	515 (94.7)	523 (96.1)
Kelsey Trail	463	375 (81)	438 (94.6)	442 (95.5)
Sun Country	748	665 (88.9)	714 (95.5)	717 (95.9)
Sunrise	642	511 (79.6)	586 (91.3)	605 (94.2)
Peer Group F				
Athabasca Health Authority	30	26 (86.7)	30 (100)	30 (100)
Keewatin Yatthé	186	139 (74.7)	167 (89.8)	173 (93)
Mamawetan Churchill River	196	143 (73)	187 (95.4)	190 (96.9)
Peer Group H				
Prairie North	1,052	770 (73.2)	918 (87.3)	953 (90.6)
Prince Albert Parkland	879	650 (73.9)	787 (89.5)	810 (92.2)
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority				
First Nations communities using Panorama	467	376 (80.5)	448 (95.9)	457 (97.9)

- (d) The denominator is the number of children registered in Panorama who turned seven years of age between January 1, 2018 and December 31, 2018, 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 January 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 15,337 children aged seven years were registered in Panorama with provincial health coverage and whose public health jurisdiction was flagged with AHA, a former HR or a First Nations community using Panorama, as of January 1, 2019. They represent approximately 94.6% of the children seven years of age in the 2017 Saskatchewan Covered Population (total number of seven-year-old children with provincial health coverage as of June 30, 2017 was 16,207).
- Of these, 76% received five doses of pertussis, 90.6% received two doses of measles and 93.4% received one dose of meningococcal serogroup C vaccine by their seventh birthday. Overall 75.6% received all three vaccine agents by age seven years.
- The immunization coverage of pertussis was less but coverage of measles and meningococcal serogroup C for seven-year-old children was higher than those reported for the two-year-old children.
- 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 Saskatoon HR were below the provincial coverage rates for all three antigens. Immunization coverage rates in the former Regina Qu'Appelle HR improved for all three antigens compared to December 2017. On the other hand, the former Saskatoon HR experienced lower coverage rates for all three antigens compared to December 2017.
- With the exception of coverage for measles in the former Five Hills HR, all former health regions in Peer

- Group D were above the provincial coverage rates for all three antigens. The former Cypress and Sunrise HRs experienced improvement in coverage rates for all three antigens compared to December 2017. With the exception of the former Heartland HR for meningococcal serogroup C, all other former health regions in this peer group saw a decline in coverage rates for all three antigens compared to December 2017.
- In Peer Group F, AHA reports coverage rate above the provincial average for all three antigens and the former Mamawetan Churchill River HR experienced coverage rates above the provincial average for measles and meningococcal serogroup C. AHA saw a decline in coverage rates for pertussis compared to December 2017 while the former HRs (i.e., Mamawetan Churchill River and Keewatin Yatthé) saw improvement in coverage for all three antigens compared to December 2017.
- In Peer Group H, the immunization coverage in the former Prince Albert Parkland HR was higher than that in the former Prairie North HR for all three antigens. The former Prairie North HR experienced improvement in immunization coverage rates for pertussis and meningococcal serogroup C while the former Prince Albert Parkland HR reported improvement in coverage rates for measles from December 2017.
- Coverage rates in the First Nations communities using Panorama were higher than the provincial coverage rates for all three antigens. However, these rates do not represent all First Nations children living in First Nations communities.

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 January 1, 2018 and December 31, 2018 were extracted from the Panorama database (as of January 1, 2019). Only children with Saskatchewan health coverage and flagged under AHA, a former health region jurisdiction or a First Nations community using Panorama, as of the date of data extraction were included.
- For coverage of two-year-old children, immunization histories of the children born between January 2016 and December 2016 were followed up to two years since birth.
- For coverage of seven-year-old children, immunization histories of the children born between January 2011 and December 2011 were followed up to seven years since birth.
- The immunization coverage report on children who turned two and seven years between January 2017 and December 2017 with a health region jurisdiction 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.
- Immunization coverage depends on the age of the children. For example, it is recommended that children receive two doses of measles by their

second birthday, as well as by their seventh birthday. Therefore, the percentage of children immunized against measles 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.

- 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., 2017, 2016).
- 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 (December 2018) and the December 2017 childhood immunization coverage report. Coverage rate differences are not applicable (N/A) for Saskatchewan, the Saskatchewan Health Authority and First Nations communities using Panorama because December 2017 rates either do not include First Nations communities using Panorama or are not available.

Jurisdiction (with former health region by peer group)	Pertussis		Measles		Meningococcal serogroup C	
	December 2017	Difference	December 2017	Difference	December 2017	Difference
Saskatchewan	N/A		N/A		N/A	
Saskatchewan Health Authority	N/A		N/A		N/A	
Peer Group A						
Regina Qu'Appelle	75.1	4.1	74	4.7	87	1.4
Saskatoon	80.5	1.5	80	2	89.9	1.2
Peer Group D						
Cypress	82.8	1.8	82.6	2.8	91.8	0.4
Five Hills	82	1.7	81.8	1.9	92.7	-1
Heartland	86	1.8	85.8	2.7	92.5	-0.1
Kelsey Trail	87.7	4.3	88.4	4.4	96.2	-0.7
Sun Country	92.2	0.1	91.5	1.1	96	-1.2
Sunrise	82	1.2	81.5	-0.3	90	0.4
Peer Group F						
Athabasca Health Authority	70.3	1.1	70.3	9.7	94.6	-0.3
Keewatin Yatthé	61.9	1	61.9	4.1	84.4	4.3
Mamawetan Churchill River	72.6	11.7	76.3	9.9	95.6	1.9
Peer Group H						
Prairie North	72.2	3.3	69.8	4.4	85.8	0.9
Prince Albert Parkland	67.1	3.2	66.4	4	85.4	1.9
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority						
First Nations communities using Panorama	N/A		N/A		N/A	

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 (December 2018) and the December 2017 childhood immunization coverage report. Coverage rate differences are not applicable (N/A) for Saskatchewan, the Saskatchewan Health Authority and First Nations communities using Panorama because December 2017 rates either do not include First Nations communities using Panorama or are not available.

Jurisdiction (with former health region by peer group)	Pertussis		Measles		Meningococcal serogroup C	
	December 2017	Difference	December 2017	Difference	December 2017	Difference
Saskatchewan	N/A		N/A		N/A	
Saskatchewan Health Authority	N/A		N/A		N/A	
Peer Group A						
Regina Qu'Appelle	75.7	0.3	90	1	93.1	0.9
Saskatoon	72.7	-1	88.7	-0.2	92.2	-0.3
Peer Group D						
Cypress	84	2.1	93.5	0.2	94.7	0.2
Five Hills	78.9	-2.2	90.9	-0.9	94.4	-0.6
Heartland	87.2	-3.9	94.9	-0.2	95.8	0.3
Kelsey Trail	83.5	-2.5	94.9	-0.3	96.3	-0.8
Sun Country	90.2	-1.3	96.3	-0.8	97	-1.1
Sunrise	75.6	4	89.3	2	92.6	1.6
Peer Group F						
Athabasca Health Authority	89.4	-2.7	91.5	8.5	91.5	8.5
Keewatin Yatthé	66.5	8.2	88	1.8	90.6	2.4
Mamawetan Churchill River	68.4	4.6	89.1	6.3	94.2	2.7
Peer Group H						
Prairie North	71.5	1.7	87.5	-0.2	90.2	0.4
Prince Albert Parkland	74.6	-0.7	88.6	0.9	92.5	-0.3
First Nations and Inuit Health Branch and Northern Inter-Tribal Health Authority						
First Nations communities using Panorama	N/A		N/A		N/A	