

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

Quarterly Report: December 2016

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## **Purpose:**

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 and health regions clustered by peer groups.

## **Reporting Period:**

Jan 2016 - Dec 2016

## **Data Source:**

Panorama  
(as of January 12, 2017)

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## **Executive Summary**

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.

In Saskatchewan, immunization coverage of three key antigens by the 2nd and 7th birthdays, respectively, are:

- Pertussis: 76.8% and 76.2%
- Measles: 76.3% and 90.2%
- Meningococcal serogroup C disease: 88.3% and 92.9%

- 74.7% of children by the age of two years and 75.6% of children by the age of seven years were immunized with all three vaccine agents.
- Immunization coverage for pertussis, measles and meningococcal serogroup disease increased for 2-year-old children from 2015 (the difference being 1.8%, 1.7% and 0.2%, respectively).
- Immunization coverage for pertussis, measles and meningococcal serogroup disease increased for 7-year-old children from 2015 (the difference being 0.3%, 0.4% and 0.1%, respectively).

## **Background**

Immunization is a cost-effective preventive measure which has saved more lives than any other health measure.

In Saskatchewan, immunization programs are primarily delivered by regional public health services.

First Nations and Inuit Health Branch (FNIHB) - Saskatchewan Region and the Northern Inter-Tribal Health Authority (NITHA) are responsible for providing immunizations to First Nations (FN) children living on reserve.

Panorama includes information on the jurisdictional organization (JORG) responsible for delivering immunizations to a child registered in Panorama (e.g., a 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 Regina Qu'Appelle Health Region (RQHR) is immunized in Saskatoon, she will be counted and reported under the RQHR, not under the Saskatoon Health Region.

## **Limitations**

Vaccines delivered outside regional public health services (e.g., in an emergency department, a physician's office) may not be recorded in Panorama.

Most FNIHB and NITHA communities, with the exception of those in the Athabasca Health Authority (AHA), are not currently using Panorama. Therefore, immunization data for most FN children are missing or are incomplete.

Panorama under a health region jurisdiction as of January 12, 2017. In other words, children with Saskatchewan health coverage and registered in Panorama under FNIHB or NITHA jurisdiction are excluded (including those from FNIHB and NITHA communities in AHA). This means this report does not include coverage statistics for the entire provincial or regional population.

This report includes only those children with Saskatchewan health coverage and registered in

# 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 12, 2017)

**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 health region as of December 31, 2016.

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)
<b>Saskatchewan</b>	<b>14,378</b>	<b>11,046 (76.8)</b>	<b>10,975 (76.3)</b>	<b>12,693 (88.3)</b>
<b>Peer Group A</b>				
Regina Qu'Appelle	3,876	2,907 (75.0)	2,910 (75.1)	3,354 (86.5)
Saskatoon	4,653	3,761 (80.8)	3,719 (79.9)	4,198 (90.2)
<b>Peer Group D</b>				
Cypress	475	417 (87.8)	418 (88.0)	443 (93.3)
Five Hills	653	504 (77.2)	494 (75.7)	581 (89.0)
Heartland	541	448 (82.8)	437 (80.8)	491 (90.8)
Kelsey Trail	451	346 (76.7)	348 (77.2)	405 (89.8)
Sun Country	767	683 (89.0)	680 (88.7)	717 (93.5)
Sunrise	628	464 (73.9)	459 (73.1)	545 (86.8)
<b>Peer Group F</b>				
Athabasca Health Authority	35	29 (82.9)	29 (82.9)	32 (91.4)
Keewatin Yatthé	161	88 (54.7)	91 (56.5)	133 (82.6)
Mamawetan Churchill River	195	129 (66.2)	125 (64.1)	169 (86.7)
<b>Peer Group H</b>				
Prairie North	1,061	732 (69.0)	729 (68.7)	905 (85.3)
Prince Albert Parkland	882	538 (61.0)	536 (60.8)	720 (81.6)

(a) The denominator includes children registered in Panorama who turned two years of age between January 1, 2016 and December 31, 2016, have Saskatchewan provincial health coverage, and are flagged as under health region jurisdiction for public health services, as of January 12, 2017.

(b) The numerator includes those children from the denominator who received the recommended number of doses of the respective antigen by their second birthday.

- In Saskatchewan, there were 14,378 children aged two years registered in Panorama with provincial health coverage and flagged under health region jurisdiction, as of January 12, 2017. They represent approximately 91.1% of the children two years of age in the 2016 Saskatchewan Covered Population (total number of 2-year-old children with provincial health coverage as of June 30, 2016 was 15,788).

- 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 76.8%, 76.3% and 88.3%, respectively. Overall 74.7% children received all three vaccine agents by age two years, compared to 72.9% children who turned two years between January 2015 and December 2015 (data not shown).

- In Peer Group A, the immunization coverage rates were higher in Saskatoon Health Region than in Regina Qu'Appelle Health Region. Vaccine coverage in Saskatoon Health Region was above the provincial average as well. The coverage rates in Regina Qu'Appelle's region were below the provincial coverage rates for all three antigens. Saskatoon Health Region experienced improved coverage rates for all three antigens from 2015. On the other hand, Regina Qu'Appelle Health Region experienced a decline in coverage rates for all three antigens from 2015.

- Most of the health regions in Peer Group D had higher percentages of two-year-old children receiving the recommended number of doses than the provincial average. With the exception of Five Hills Health Region for measles, Kelsey Trail for pertussis and Sunrise Health Region for all three antigens, coverage rates among two-year-old children for all health regions in this peer group were higher than the provincial average. Since 2015, only Five Hills Health Region for meningococcal serogroup C and Sunrise Health Region for all three antigens experienced declines in immunization coverage. All other health regions in this peer group saw an improvement in coverage rates for all three antigens since 2015.

- Immunization data from Keewatin Yatthé and Mamawetan Churchill River health regions in Peer Group F are incomplete. Therefore, the coverage statistics should be interpreted with caution.

- In Peer Group H, both health regions have a higher aboriginal population compared to Saskatchewan (Prairie North 30.3%, Prince Albert Parkland 38.9%, Saskatchewan 15.6%: National Household Survey 2011, Statistics Canada). Their aboriginal populations live mainly in FN communities on reserve that do not report to Panorama. Therefore, the coverage statistics may be underestimated.

# 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 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 12, 2017)

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 health region as of December 31, 2016.

Health Region, by Peer Group	Number of Eligible Children in Panorama (c)	Number of Eligible children Immunized (%) (d)		
		Pertussis (5 doses)	Measles (2 doses)	Meningococcal serogroup C (1 dose)
<b>Saskatchewan</b>	<b>15,140</b>	<b>11,532 (76.2)</b>	<b>13,659 (90.2)</b>	<b>14,065 (92.9)</b>
<b>Peer Group A</b>				
Regina Qu'Appelle	3,924	2,981 (76.0)	3,544 (90.3)	3,636 (92.7)
Saskatoon	4,794	3,563 (74.3)	4,309 (89.9)	4,459 (93.0)
<b>Peer Group D</b>				
Cypress	529	434 (82.0)	490 (92.6)	503 (95.1)
Five Hills	704	551 (78.3)	643 (91.3)	658 (93.5)
Heartland	549	454 (82.7)	514 (93.6)	522 (95.1)
Kelsey Trail	462	373 (80.7)	423 (91.6)	434 (93.9)
Sun Country	819	695 (84.9)	770 (94.0)	781 (95.4)
Sunrise	683	557 (81.6)	619 (90.6)	635 (93.0)
<b>Peer Group F</b>				
Athabasca Health Authority	91	84 (92.3)	89 (97.8)	91 (100)
Keewatin Yatthé	184	133 (72.3)	163 (88.6)	168 (91.3)
Mamawetan Churchill River	248	176 (71.0)	222 (89.5)	231 (93.1)
<b>Peer Group H</b>				
Prairie North	1,186	850 (71.7)	1,035 (87.3)	1,070 (90.2)
Prince Albert Parkland	967	681 (70.4)	838 (86.7)	877 (90.7)

- (c) The denominator includes children registered in Panorama who turned seven years of age between January 1, 2016 and December 31, 2016., have Saskatchewan provincial health coverage, and are flagged as under health region jurisdiction for public health services, as of January 12, 2017.
- (d) The numerator includes children from the denominator who received the recommended number of doses of the respective antigen by their seventh birthday.

- A total of 15,140 children aged seven years were registered in Panorama with provincial health coverage and flagged under health region jurisdiction, as of January 12, 2017. They represent approximately 94.8% of the children of age seven years in the 2016 Saskatchewan Covered Population (total number of 7-year-old children with provincial health coverage as of June 30, 2016 was 15,978).
- Of these, 76.2% received five doses of pertussis, 90.2% received two doses of measles and 92.9% received one dose of meningococcal serogroup C vaccine by their seventh birthday. Overall 75.6% received all three vaccine agents by age seven years, compared to 75.1% in 2015 (data not shown).
- The immunization coverage of pertussis was slightly less but measles and meningococcal serogroup C antigens for 7-year-old children was higher than those reported for the 2-year-old children. Two possible explanations for the overall higher rates are: (a) a greater opportunity for contact between public health and a child attending school and (b) the extended time window that allowed for those who were behind in their immunization schedule to catch up.
- In Peer Group A, immunization coverage was higher in Regina Qu'Appelle Health Region than in Saskatoon Health Region for pertussis and measles but less for meningococcal serogroup C antigen. Coverage rates in Regina Qu'Appelle Health Region were higher than provincial average for measles but less for pertussis and meningococcal serogroup C antigen. Coverage rates for pertussis and measles in Saskatoon Health Region were below the provincial average. Coverage rates in Regina Qu'Appelle Health Region improved for pertussis and measles but declined for meningococcal serogroup C antigen from 2015. In Saskatoon Health Region, immunization coverage for measles improved from 2015, remained unchanged for meningococcal serogroup C and declined for pertussis from 2015.
- In Peer Group D all health regions in this peer group were above the provincial coverage rates for all three antigens. Coverage rates in Five Hills Health Region for measles, in Cypress Health Region for pertussis and measles and in Heartland Health Region for all three antigens saw a decline since 2015.
- Immunization data from Keewatin Yatthé and Mamawetan Churchill River health regions in Peer Group F are incomplete. Therefore, the coverage statistics should be interpreted with caution.
- In Peer Group H, with the exception of meningococcal serogroup C, the immunization coverage in Prairie North Health Region was higher than that in Prince Albert Parkland Health Region. Both health regions have a higher aboriginal population compared to Saskatchewan. Their aboriginal populations live mainly in FN communities on reserve that do not report to Panorama. Therefore, the coverage statistics may be underestimated.

# TECHNICAL NOTES

## Panorama:

- Panorama is a comprehensive, integrated public health information system. Of the five modules in the system, two have been implemented: vaccine inventory and immunization. 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](http://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: <http://www.ehealthsask.ca/HealthRegistries/Pages/Covered-Population.aspx>

## Data and Methods:

- Immunization data for the children who turned two and seven years between January 1, 2016 and December 31, 2016 were extracted from the Panorama database (as of January 12, 2017). Only children with Saskatchewan health coverage and flagged under health region jurisdiction, as of the date of data extraction were included.
- Children with Saskatchewan health coverage and flagged under FNIHB or NITHA jurisdiction were excluded.
- For coverage of 2-year-old children, immunization histories of the children born between January 2014 and December 2014 were followed up to two years since birth.
- For coverage of 7-year-old children, immunization histories of the children born between January 2009 and December 2009 were followed up to seven years since birth.
- The immunization coverage report on children who turned two and seven years between January 2015 and December 2015 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 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., 2016, 2015).

## Peer Group:

A peer group consists of 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 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).

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

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

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 2016) and the December 2015 childhood immunization coverage report.

Health Region, by Peer Group	Pertussis		Measles		Meningococcal serogroup C	
	December 2015	Difference	December 2015	Difference	December 2015	Difference
<b>Saskatchewan</b>	<b>75.0</b>	<b>1.8</b>	<b>74.6</b>	<b>1.7</b>	<b>88.1</b>	<b>0.2</b>
<b>Peer Group A</b>						
Regina Qu'Appelle	76.3	-1.3	75.4	-0.3	88.3	-1.8
Saskatoon	78.3	2.5	77.8	2.1	89.7	0.5
<b>Peer Group D</b>						
Cypress	79.3	8.5	78.2	9.8	91.5	1.8
Five Hills	74.6	2.6	73.2	2.5	89.3	-0.3
Heartland	79.9	2.9	79.7	1.1	90.7	0.1
Kelsey Trail	69.6	7.1	71.0	6.2	84.5	5.3
Sun Country	82.3	6.7	81.8	6.9	92.0	1.5
Sunrise	75.6	-1.7	75.5	-2.4	87.5	-0.7
<b>Peer Group F</b>						
Athabasca Health Authority	85.3	-2.4	82.4	0.5	91.2	0.2
Keewatin Yatthé	57.6	-2.9	58.7	-2.2	85.9	-3.3
Mamawetan Churchill River	62.1	4.1	64.8	-0.7	83.0	3.7
<b>Peer Group H</b>						
Prairie North	69.1	-0.1	68.1	0.6	84.8	0.5
Prince Albert Parkland	58.9	2.1	59.7	1.1	80.5	1.1

**Table 5:** Coverage rate difference of **7-year-old children** immunized for the recommended number of doses against pertussis (5 doses), measles (two doses) and meningococcal serogroup C disease (one dose) between this report (December 2016) and the December 2015 childhood immunization coverage report.

Health Region, by Peer Group	Pertussis		Measles		Meningococcal serogroup C	
	December 2015	Difference	December 2015	Difference	December 2015	Difference
<b>Saskatchewan</b>	<b>75.9</b>	<b>0.3</b>	<b>89.8</b>	<b>0.4</b>	<b>92.8</b>	<b>0.1</b>
<b>Peer Group A</b>						
Regina Qu'Appelle	75.8	0.2	90.2	0.1	93.1	-0.4
Saskatoon	74.8	-0.5	89.7	0.2	93.0	0.0
<b>Peer Group D</b>						
Cypress	84.0	-2.0	93.5	-0.9	94.9	0.2
Five Hills	77.2	1.1	91.9	-0.6	93.5	0.0
Heartland	86.8	-4.1	94.4	-0.8	95.5	-0.4
Kelsey Trail	78.3	2.4	89.9	1.7	93.1	0.8
Sun Country	81.4	3.5	91.7	2.3	92.7	2.7
Sunrise	79.3	2.3	88.4	2.2	92.4	0.6
<b>Peer Group F</b>						
Athabasca Health Authority	78.0	14.3	93.2	4.6	98.3	1.7
Keewatin Yatthé	73.9	-1.6	88.8	-0.2	91.3	0.0
Mamawetan Churchill River	70.1	0.9	89.3	0.2	95.2	-2.1
<b>Peer Group H</b>						
Prairie North	66.8	4.9	85.9	1.4	89.6	0.6
Prince Albert Parkland	73.7	-3.3	86.7	0.0	91.1	-0.4