

Vaccine Preventable Disease Monitoring Report Varicella, 2015 and 2016

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Purpose:

The Saskatchewan Ministry of Health's Population Health Branch provides routine surveillance of notifiable diseases at the provincial and regional health authority (RHA), First Nations and Inuit Health Branch (FNIHB) and Northern Inter-Tribal Health Authority (NITHA) levels.

This report presents the most recent data for reportable communicable diseases as collected by the Integrated Public Health Information System (iPHIS) and immunization coverage information as collected by the Saskatchewan Immunization Management System (SIMS) and Panorama. Limitations associated with these systems have been described elsewhere.

Report Features:

Background
Epidemiological Summary
Vaccine Coverage by RHA

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Background

Varicella (chickenpox) is a viral illness caused by the varicella-zoster virus. The classic symptom is a rash with itchy, fluid-filled blisters in successive crops that turn into scabs.

Varicella is generally considered a mild infection. Five to ten percent of otherwise healthy children may develop complications that may be fatal. Complications may include secondary bacterial infections, soft tissue infections, otitis media, bacteraemia, osteomyelitis, septic arthritis, endocarditis, necrotizing fasciitis, toxic shock-like syndrome, thrombocytopenia, cerebellar ataxia, encephalitis and hepatitis.

Transmission of varicella occurs through airborne virus as well as through direct or indirect contact of oral or nasal mucous membranes with respiratory secretions or vesicular fluid. Transmission occurs from one to two days before onset of rash and continues until all lesions are crusted, which is approximately five days.

Varicella is a more severe disease in adults, with a case fatality rate 10 to 30 times higher than in children. Moreover, in both adults and children, the majority who die of varicella have no identifiable risk factor for severe disease.

Neonates who develop varicella at five to 10 days are at increased risk for severe generalized varicella. The case-fatality rate for neonates whose mother developed varicella five days before delivery to within two days following delivery and who did not receive varicella-zoster immune globulin or antiviral therapy can reach 30%.

The virus lies dormant in the nerves and in about 10-20% of cases it reactivates at a later time causing shingles.

Immunization

The current Saskatchewan Routine Immunization Schedule recommends varicella-containing vaccines to children at 12 and 18 months of age and to Grade 6 students.

The varicella vaccine was added to the Schedule in January 2005. At that time, 12 month-old children (i.e., born since January 1, 2004) and susceptible Grade 6 students born since 1994 were eligible to receive one dose. Susceptible Grade 6 students were those without a history of disease.

In April 2011, a two-dose series at 12 and 18 months of age replaced the single dose at 12 months of age (i.e., children born since October 1, 2009). Susceptible Grade 6 students continued to be eligible for a single dose.

In 2014 there was a national recommendation that stated that varicella immunity should consist of either lab-confirmed serological immunity; or the receipt of two varicella doses after the first birthday. Therefore, Grade 6 students will continue to be offered a varicella dose until the 2020-2021 school year, when the first birth cohort to receive the two-dose series will have reached Grade 6.

Surveillance

The Public Health Act, 1994 requires Saskatchewan health care providers to report cases and outbreaks of varicella to the local medical health officer (MHO) for public health follow up. Saskatchewan Disease Control Laboratory (SDCL) is also required to report positive laboratory results to the local MHO. However, case

reporting to the Chief and Deputy Chief Medical Health Officers via the integrated Public Health Information System (iPHIS) is not required. SDCL creates counts of positive laboratory specimens and calculates the proportion of positive specimens among specimens tested.

EPIDEMIOLOGY AND VACCINE COVERAGE SUMMARY

Varicella in Saskatchewan:

- Individual varicella cases are not reported to the Ministry of Health; therefore, case counts and case characteristics are not available.
- Six varicella outbreaks were reported between 2012 and 2016.

Table 1: Varicella vaccine coverage by year, 2012 to 2016

Age	Doses	2016	2015	2014	2013	2012
13 months	1	58.3%	59.0%	58.3%	55.1%	55.1%
18 months	1	83.9%	81.9%	83.4%	82.2%	82.7%
19 months	1	85.1%	83.5%	84.9%	83.8%	84.3%
	2	46.2%	46.1%	45.1%	43.7%	44.2%
24 months	1	88.1%	86.8%	87.5%	88.0%	87.1%
	2	75.8%	72.7%	74.9%	74.7%	73.5%
5 years	1	91.9%	89.1%	90.7%	88.9%	88.1%
	2	86.0%	81.8%	24.6%	N/A	N/A
7 years	1	91.3%	88.7%	89.4%	88.4%	86.3%
13 years	1	79.2%	48.7%	38.5%	31.6%	26.0%
15 years	1	41.1%	33.5%	27.6%	21.8%	19.6%
17 years	1	28.1%	22.4%	20.2%	15.0%	12.1%*

*Immunization records may be incomplete for children born prior to 1996. Therefore, the immunization coverage for 17-year-old adolescents may not reflect actual provincial or RHA rates.

N/A = not applicable because the 2-dose series was not available to the birth cohort.

Varicella Coverage in Saskatchewan: 2012 to 2016

- From 2012 to 2016, provincial immunization coverage rates improved for all age-dose categories.
- As varicella was added to the publicly funded immunization program in 2005, older children (13-17 years) have lower rates of immunization for all the years.
- The lower vaccination rates in the older age group (17-year-olds) reflect that this group was not offered varicella vaccine as many were considered immune due to a history of varicella disease.

VACCINE COVERAGE SUMMARIES

Table 2: Varicella Vaccine Coverage by Health Region, 2016 (selected age & dose)

Health Region, by Peer Group	Vaccine coverage (% immunized), by age and dose													
	13 months		18 months		19 months		24 months		5 years		7 years	13 years	15 years	17 years
	1 dose	1 dose	1 dose	2 doses	1 dose	2 doses	1 dose	2 doses	1 dose	2 doses	1 dose	1 dose	1 dose	1 dose
Saskatchewan	58.3	83.9	85.1	46.2	88.1	75.8	91.9	86.0	91.3	79.2	41.1	28.1		
Peer Group A														
Regina Qu'Appelle	52.6	81.6	82.8	43.7	86.5	74.4	91.7	85.3	91.1	78.4	36.6	26.8		
Saskatoon	59.8	86.5	87.9	47.8	90.1	79.4	92.1	86.1	91.6	80.3	43.7	31.8		
Peer Group D														
Cypress	64.0	87.0	88.8	56.2	93.5	87.8	93.3	91.3	92.2	81.8	49.3	32.3		
Five Hills	69.2	87.0	88.1	48.2	87.7	75.0	92.8	85.1	92.5	81.4	41.6	28.8		
Heartland	63.6	88.1	89.6	52.5	90.8	80.2	94.9	89.7	93.6	83.3	51.5	33.7		
Kelsey Trail	69.5	86.4	85.2	53.0	89.1	76.3	90.3	85.5	89.6	78.1	37.0	22.5		
Sun Country	74.9	91.9	92.6	65.1	92.8	88.0	94.2	91.9	92.9	81.7	37.7	25.0		
Sunrise	64.7	81.8	82.9	48.8	86.8	73.1	92.6	86.6	90.5	81.2	39.1	21.4		
Peer Group F														
Athabasca Health Authority	61.1	94.4	92.1	31.6	91.4	82.9	96.9	96.9	100.0	61.7	84.0	56.9		
Keewatin Yatthé	41.9	75.2	78.4	17.3	83.9	56.5	91.5	85.7	89.7	66.9	42.0	21.2		
Mamawetan Churchill River	45.7	78.4	82.1	28.3	86.2	63.6	93.0	85.5	90.7	56.3	30.7	27.5		
Peer Group H														
Prairie North	50.5	76.9	77.8	38.4	85.0	68.2	87.9	81.2	89.5	76.4	44.1	27.1		
Prince Albert Parkland	49.6	77.1	79.0	35.6	81.0	60.7	91.9	84.9	89.5	80.4	37.6	22.8		

Table 3: Varicella Vaccine Coverage by Health Region, 2015 (selected age & dose)

Health Region, by Peer Group	Vaccine coverage (% immunized), by age and dose													
	13 months		18 months		19 months		24 months		5 years		7 years	13 years	15 years	17 years
	1 dose	1 dose	1 dose	2 doses	1 dose	2 doses	1 dose	2 doses	1 dose	2 doses	1 dose	1 dose	1 dose	1 dose
Saskatchewan	59.0	81.9	83.5	46.1	86.8	72.7	89.1	81.8	88.7	48.7	33.5	22.4		
Peer Group A														
Regina Qu'Appelle	61.0	81.8	83.3	51.4	86.1	72.5	87.6	79.7	87.7	44.0	30.5	21.8		
Saskatoon	59.6	82.7	84.3	46.5	87.7	74.9	88.1	80.3	89.2	53.2	37.8	25.4		
Peer Group D														
Cypress	68.9	88.0	87.7	56.2	90.7	78.0	92.9	88.1	91.1	49.7	37.1	24.7		
Five Hills	59.9	81.0	82.6	42.1	87.4	69.3	90.7	83.1	90.2	47.8	30.2	23.0		
Heartland	60.9	85.4	86.5	44.8	88.8	78.0	92.9	88.0	91.9	53.1	37.5	23.8		
Kelsey Trail	53.8	82.1	85.9	39.0	85.8	71.4	91.8	86.2	88.2	43.6	27.3	14.8		
Sun Country	70.5	90.2	91.1	59.4	92.6	83.2	95.0	91.8	89.9	45.8	34.5	15.2		
Sunrise	58.1	83.6	85.1	44.4	86.2	72.8	89.8	83.7	87.8	47.0	29.5	13.4		
Peer Group F														
Athabasca Health Authority	79.4	85.3	87.1	58.1	94.1	82.4	93.6	91.5	96.5	46.9	66.0	57.6		
Keewatin Yatthé	45.0	74.7	75.8	23.0	86.1	60.0	87.2	81.4	90.1	51.1	24.0	24.1		
Mamawetan Churchill River	45.5	79.6	81.6	31.3	86.4	67.2	91.8	76.7	93.4	39.1	26.1	20.5		
Peer Group H														
Prairie North	53.2	77.8	79.6	37.2	84.8	67.6	86.8	78.7	85.6	49.6	33.2	24.5		
Prince Albert Parkland	44.8	71.3	74.2	30.8	80.5	60.1	90.5	83.0	87.4	49.3	30.6	21.9		

- Two years of coverage data in 12 age-dose categories are provided by RHA. A yellow highlighted cell means the RHA's coverage rate is below the provincial coverage rate.
- Varicella vaccine was added to the publicly-funded immunization program in 2005 as a single-dose vaccine. It was offered to 12-month old children born since January 1, 2004 and susceptible Grade 6 students born since 1994 (i.e., without history of disease).
- In 2015, the first eligible infant cohort is 11 years old and the first eligible student cohort is 21 years old. Not unexpectedly, the coverage rates for adolescents is low (22.4 to 48.7% provincially) and may be a reflection of the higher likelihood of these adolescents having had a history of disease which exempted them from immunization. This trend is repeated for 15- and 17-year old children in 2016.
- In April 2011, a two-dose series offered at 12 and 18 months replaced the single dose at 12 months of age for children born since October 1, 2009. In 2015, the first eligible infant cohort for the two-dose series is six years old. Therefore, two-dose coverage rates are reported for 19 month, 24 month and five year-old children.
- At the provincial level, immunization coverage improved from 2015 to 2016 for all age-dose categories, with the exception of 13 month-old children.
- In 2016, the one-dose coverage rate was higher among the 19-month age-group compared to the 13-month age-group: 85.1% vs. 58.3%. It was even higher for the five-year-old age-group at 91.9%.
- In 2016, three RHAs reported coverage rates at or above the provincial average for all twelve age-dose categories.
- In 2016, one RHA was below the provincial average in all age-dose categories and three RHAs were below the provincial average in all but one age-dose categories.

SURVEILLANCE CASE DEFINITION: Saskatchewan CDC Manual

Respiratory and Direct Contact Varicella (Chickenpox)



Photo Courtesy of Centers for Disease Control

¹Clinical illness is characterized by a rash with rapid evolution of macules to papules, vesicles, and crusts; all stages are simultaneously present; lesions are superficial and may appear in crops.

Notification Timeline:

From Lab/Practitioner to Public Health: Within 48 hours.

From Public Health to Ministry of Health: Immediate for known outbreaks. Individual cases are not reportable to the Ministry.

Public Health Follow-up Timeline: Less than 48 hours for prenatal and neonatal cases and contacts.

Case Definition (adopted from Public Health Agency of Canada, 2008)

Confirmed Case

Clinical evidence of illness¹ and laboratory confirmation of infection:

- isolation or direct antigen detection of varicella-zoster virus (VZV) from an appropriate clinical specimen

OR

- detection of VZV DNA

OR

- seroconversion or a significant rise (e.g., fourfold or greater) by any standard serologic assay in varicella-zoster IgG titre between acute and convalescent sera

OR

- positive serologic test for varicella-zoster IgM antibody

OR

- clinical evidence of illness¹ in a person with an epidemiologic link to a laboratory-confirmed case of chickenpox or VZV infection.

Probable case

Clinical evidence of illness¹ in the absence of laboratory confirmation or epidemiologic link to a laboratory confirmed case.

DATA NOTES

There are 10 peer groups used by Statistic Canada, each identified by a letter (A to J). A peer group consists of health regions with similar socio-economic characteristics which facilitates comparisons within a peer group. The twelve health regions and one health authority in Saskatchewan fall into four groups identified by letters A, D, F and H.

Vaccine Coverage Data Source: The Saskatchewan Immunization Management System (SIMS) was a client-based registry recording vaccines delivered by public health services. It did not include vaccines delivered by First Nations (FN) communities that did not use SIMS.

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. It does not include vaccines delivered by FN communities that do not use Panorama.

SIMS was implemented province-wide in 2001 and was replaced by Panorama's immunization module on January 27, 2015. To learn more, please visit: www.ehealthsask.ca/services/panorama/Pages/default.aspx.

This report includes only those children with Saskatchewan health coverage and registered in Panorama under a health region jurisdiction as of January 12, 2017. This means this report does not include coverage statistics for the entire provincial or regional populations.

Varicella-containing vaccine is administered as measles, mumps, rubella and varicella (MMRV) or univalent-varicella vaccine. Immunization coverage is based on those who turned 13, 18, 19 and 24 months and five, seven, 13, 15 and 17 years by December 31 in 2015 and 2016. For example, the immunization coverage for 24-month-old children in 2016 is based on clients who were born in 2014 and their immunization records up to December 31, 2016.