

# Vaccine Preventable Disease Monitoring Report Varicella, 2014

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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 authorities (RHAs), First Nations and Inuit Health Branch Saskatchewan (FNIHB-SK) Region and Northern Inter-Tribal Health Authority (NITHA) levels.

This report presents the most recent data for 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.

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 5-10 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 (Varig) or antiviral therapy can reach 30%.

The virus lays 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 via the integrated Public Health Information

System (iPHIS) is not required to the Chief and Deputy Chief Medical Health Officers. 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.
- Four varicella outbreaks were reported between 2012 and 2014, mainly among elementary school students who were unimmunized or had received only one dose of the varicella vaccine.

**Table 1: Varicella vaccine coverage by year**

Age	Doses	2014	2013	2012
13 months	1	58.3%	55.1%	55.1%
18 months	1	83.4%	82.2%	82.7%
19 months	1	84.9%	83.8%	84.3%
	2	45.1%	43.7%	44.2%
24 months	1	87.5%	88.0%	87.1%
	2	74.9%	74.7%	73.5%
5 years	1	90.7%	88.9%	88.1%
	2	24.6%	N/A	N/A
7 years	1	89.4%	88.4%	86.3%
13 years	1	38.5%	31.6%	26.0%
15 years	1	27.6%	21.8%	19.6%
17 years	1	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 2-dose series not available to the birth cohort.

## Analysis:

- 2012 – Coverage rates among adolescents is low and may be a reflection of the higher likelihood of these adolescents having had a history of disease, which exempted them from immunization.
- 2013 – Coverage rates are similar to those reported in 2012.
- 2014 – All age-dose categories show an improvement over 2012 coverage rates.

# VACCINE COVERAGE SUMMARIES

**Table 2: Varicella Vaccine Coverage by Health Region, 2014 (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
<b>Saskatchewan</b>	58.3	83.4	84.9	45.1	87.5	74.9	90.7	24.6	89.4	38.5	27.6	20.2		
<b>Peer Group A</b>														
Regina Qu'Appelle	58.3	82.6	84.2	48.3	86.0	73.7	90.2	22.1	89.7	34.6	26.3	18.3		
Saskatoon	62.0	85.0	86.4	49.1	89.2	77.5	91.3	26.3	90.2	40.6	31.5	22.9		
<b>Peer Group D</b>														
Cypress	58.7	84.3	84.7	51.3	89.8	80.8	92.9	27.2	91.0	47.2	32.5	24.9		
Five Hills	61.2	86.4	86.6	47.9	88.5	77.7	91.1	21.4	89.5	40.5	28.8	23.1		
Heartland	63.0	87.3	87.3	49.2	90.6	81.8	92.3	21.5	91.4	50.2	32.6	21.8		
Kelsey Trail	48.1	81.9	82.3	35.6	86.2	70.0	87.1	30.1	86.3	35.1	24.0	14.5		
Sun Country	67.8	86.8	87.8	54.4	91.2	82.0	91.1	23.9	90.1	36.4	23.6	20.0		
Sunrise	57.9	81.7	83.6	41.0	86.2	73.4	89.1	20.8	88.3	36.5	20.2	16.7		
<b>Peer Group F</b>														
Athabasca Health Authority	80.0	97.6	97.7	58.1	95.7	87.0	100.0	37.6	96.9	50.0	53.7	64.4		
Keewatin Yatthé	47.3	86.7	89.0	23.8	90.9	66.1	97.5	29.0	94.4	35.5	20.9	23.1		
Mamawetan Churchill River	55.3	86.8	88.4	23.1	92.6	74.4	96.8	28.9	90.5	32.4	26.7	19.8		
<b>Peer Group H</b>														
Prince Albert Parkland	42.8	76.8	80.5	29.7	84.0	65.9	88.9	26.1	88.0	34.1	21.5	17.8		
Prairie North	52.4	79.0	80.3	32.5	82.1	66.8	89.0	24.1	85.2	41.1	26.5	15.2		

**Table 3: Varicella Vaccine Coverage by Health Region, 2013 (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
<b>Saskatchewan</b>	55.1	82.2	83.8	43.7	88.0	74.7	88.9	N/A	88.4	31.6	21.8	15.0		
<b>Peer Group A</b>														
Regina Qu'Appelle	55.3	81.9	83.4	49.6	87.4	75.8	87.9	N/A	88.7	27.9	20.9	13.7		
Saskatoon	57.5	83.5	84.8	45.5	89.3	77.8	89.4	N/A	89.6	36.1	25.5	16.2		
<b>Peer Group D</b>														
Cypress	56.5	83.8	85.5	41.4	89.8	74.7	91.8	N/A	88.8	36.3	24.1	17.4		
Five Hills	59.5	84.6	86.8	43.8	90.7	76.5	89.8	N/A	87.9	30.5	22.4	16.0		
Heartland	62.5	87.8	88.0	45.6	90.9	79.1	91.9	N/A	90.2	37.5	23.3	16.0		
Kelsey Trail	49.9	79.6	81.4	35.2	85.0	69.0	85.2	N/A	80.8	25.1	13.7	12.5		
Sun Country	70.3	88.1	89.3	61.4	90.6	83.1	90.4	N/A	92.5	33.8	15.1	13.4		
Sunrise	52.4	79.8	81.7	34.1	85.4	70.3	88.6	N/A	87.0	27.0	13.2	11.7		
<b>Peer Group F</b>														
Athabasca Health	69.6	95.5	95.7	34.8	100.0	92.5	94.8	N/A	91.1	44.1	48.6	60.4		
Keewatin Yatthé	52.2	86.6	89.1	25.9	94.1	79.4	94.2	N/A	90.6	29.5	23.7	25.5		
Mamawetan Churchill River	49.5	88.0	89.4	30.2	95.1	70.4	90.3	N/A	81.3	21.5	14.8	15.2		
<b>Peer Group H</b>														
Prince Albert Parkland	39.4	75.1	78.7	30.1	84.2	61.4	88.8	N/A	88.6	28.6	20.8	15.5		
Prairie North	45.5	75.1	76.8	29.8	81.8	65.0	86.4	N/A	83.3	30.2	24.1	11.9		

**Table 4: Varicella Vaccine Coverage by Health Region, 2012 (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
<b>Saskatchewan</b>	55.1	82.7	84.3	44.2	87.1	73.5	88.1	N/A	86.3	26.0	19.6	12.1		
<b>Peer Group A</b>														
Regina Qu'Appelle	57.5	82.6	84.5	52.6	87.2	75.9	86.6	N/A	85.5	24.7	18.1	8.4		
Saskatoon	56.9	83.1	84.8	44.0	87.1	73.6	89.9	N/A	87.0	30.0	22.4	13.5		
<b>Peer Group D</b>														
Cypress	51.4	85.6	87.1	43.2	89.5	76.3	87.7	N/A	91.3	31.4	23.5	15.7		
Five Hills	54.6	86.1	87.3	42.4	89.1	73.0	90.2	N/A	88.0	27.7	22.7	10.7		
Heartland	54.9	88.0	90.5	47.9	89.7	80.4	89.8	N/A	92.5	32.0	21.1	16.2		
Kelsey Trail	53.0	84.2	84.6	39.5	85.7	71.3	83.1	N/A	80.5	20.3	13.2	7.7		
Sun Country	63.1	90.4	91.6	57.5	93.7	85.5	90.3	N/A	89.9	22.7	19.5	10.9		
Sunrise	54.2	80.7	82.4	41.1	88.6	73.4	87.9	N/A	82.4	19.1	15.4	11.4		
<b>Peer Group F</b>														
Athabasca Health	67.5	92.0	94.3	49.1	94.4	83.3	94.1	N/A	95.7	40.4	62.1	47.5		
Keewatin Yatthé	50.0	87.6	88.1	21.4	89.6	74.7	92.9	N/A	93.0	16.4	23.5	22.5		
Mamawetan Churchill River	44.4	82.7	82.4	32.1	86.5	66.0	84.0	N/A	78.7	19.7	17.2	15.8		
<b>Peer Group H</b>														
Prince Albert Parkland	42.0	76.4	78.4	27.3	83.1	63.4	87.4	N/A	86.2	20.9	17.5	13.7		
Prairie North	50.8	75.0	75.9	33.1	82.1	64.3	84.7	N/A	82.6	25.2	15.1	10.5		

Three 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 2012, the first eligible infant cohort is 8 years old and the first eligible student cohort is 18 years old. Not unexpectedly, the coverage rates for adolescents is low (12.1 to 26% 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 in 2013 and 2014.

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. Therefore, two-dose coverage rates are reported for 19 month and 24 month-old children in all years and for five-year-old children in 2014 when the first birth cohort eligible for the two-dose series began turning five. Because of the October start date, only those turning five in the last three months of 2014 would have been eligible for the two-dose series and this is reflected in the low provincial rate of 24.6% for two doses at five years of age.

At a provincial level from 2012 to 2014, coverage improved in all age-dose categories.

In 2014, only Saskatoon Health Region and Athabasca Health Authority reported coverage rates above the provincial average for all age-dose categories.

Coverage rates for health regions in Peer Groups F and H should be interpreted with caution because many of the First Nations communities did not use SIMS.

\*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.

# SURVEILLANCE CASE DEFINITION: Saskatchewan CDC Manual

## Respiratory and Direct Contact Varicella (Chickenpox)

### 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 illness<sup>1</sup> 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 illness<sup>1</sup> in a person with an epidemiologic link to a laboratory-confirmed case of chickenpox or VZV infection.

### Probable case

Clinical evidence of illness<sup>1</sup> in the absence of laboratory confirmation or epidemiologic link to a laboratory confirmed case.



Photo Courtesy of Centers for Disease Control

<sup>1</sup>Clinical 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.

## DATA NOTES

**Case Data Source:** The Saskatchewan Integrated Public Health Information System (iPHIS) is a provincially mandated information system that supports public health surveillance. Confirmed cases must meet the provincial surveillance case definition, however, case reporting via iPHIS to the Chief and Deputy Chief Medical Health Officers is not required.

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 thirteen health regions in Saskatchewan fall into four groups identified by letters A, D, F and H.

**Vaccine Coverage Data Source:** The Saskatchewan Immunization Management System (SIMS) is a client-based registry recording vaccines delivered by regional public health services. It does not include vaccines delivered out of province or by First Nations communities that declined to use SIMS. Immunization data from Keewatin Yatthé and Mamawetan Churchill River health regions and historical data from Athabasca Health Authority are incomplete. As a result, this report does not provide immunization coverage 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 5, 7, 13, 15 and 17 years by December 31 in 2012, 2013 and 2014. For example, the immunization coverage for 24-month-old children in 2014 is based on clients who were born in 2012 and their immunization records up to December 31, 2014.