

# Vaccine Preventable Disease Monitoring Report Rubella, 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.

Under *The Public Health Act, 1994* and the accompanying Disease Control Regulations, local medical health officers (MHOs) must report Categories I and II Communicable Diseases, as well as any communicable disease outbreaks to the Chief and Deputy Chief Medical Health Officers. Rubella is a Category I disease.

## **Report Features:**

Background  
Epidemiological Summary  
Surveillance Case Definition  
Case Counts by Year  
Case Characteristics  
Vaccine Coverage by RHA

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## **Background**

Rubella, also called German measles or three-day measles, is a contagious viral infection characterized by a distinctive red rash. It is not the same as measles (rubeola); it is caused by a different virus and is not as infectious or severe. Rubella virus is a member of the family *Togaviridae*, genus *Rubivirus*.

Symptoms are generally mild and occur two-three weeks after exposure, last two-three days, and may include: mild fever (up to 38.9° C); headache; stuffy nose; inflamed, red eyes; enlarged lymph nodes at the base of the skull, back of the neck and behind the ears; a fine pink rash that begins on the face, spreads to the trunk and then arms and legs, disappearing in the same sequence; and aching joints, particularly in young women.

Women contemplating pregnancy should ensure their immunizations are up to date. Infection in the first trimester of pregnancy can cause fetal death or serious

birth defects. Rubella during pregnancy is the most common cause of congenital deafness and it can also cause defects of the heart, eyes or other organs. There have been no reported cases of congenital rubella syndrome (CRS) in Canada since 2000.

Since 2005, when rubella was declared eliminated from Canada, only sporadic cases have occurred because of importations associated with travel. This can lead to spread in Canada, particularly in those who are unvaccinated or under-vaccinated. In 2015, the World Health Organization (WHO) declared rubella eliminated from the Americas (North America, Central America and South America). Rubella virus is still circulating in the rest of the world.

## **Immunization**

The Saskatchewan Routine Childhood Immunization Schedule recommends two doses of rubella containing vaccine for infants, children and adolescents. The first dose is recommended at 12 months of age and a second dose at 18 months.

Rubella is highly communicable and occurs throughout the world. An immunity threshold of 83% to 85% is

required to interrupt or stop rubella transmission. Of those immunized against rubella, over 97% develop immunity after one dose of the vaccine.

Immunization coverage is a reliable indicator of the preventative measures to control the spread of disease. It measures the proportion of individuals immunized with the recommended doses.

## **Surveillance**

Under *The Public Health Act, 1994*, Saskatchewan health care providers are required to report cases to the local medical health officer (MHO) who then reports the case to the Chief and Deputy Chief Medical Health Officers using the case definition in the Saskatchewan Communicable Disease Control Manual.

Notifiable diseases may be undetected, therefore underreported, due to a number of factors including lack of contact with the health care system or lack of detection related to lab methodology. Some communicable diseases occur rarely and therefore, rates are based on small numbers of cases which may fluctuate

dramatically over time. In these cases, year to year comparisons should be interpreted with caution.

Surveillance case definitions ensure uniform reporting to allow comparability of surveillance data. The definitions are not intended to be used for clinical or laboratory diagnosis or management of patients.

Rubella molecular epidemiology (genotyping) may be used to establish whether connections exist between concurrent rubella cases or outbreaks and/or to indicate possible sources of importations from outside Canada.

# EPIDEMIOLOGY SUMMARY

## Rubella in Saskatchewan: 2015

- No cases of lab-confirmed rubella were reported.
- No cases were reported hospitalized.

## Rubella in Saskatchewan: 2011 to 2015

- No cases of lab-confirmed rubella were reported.
- No cases were reported hospitalized.
- The last case of rubella was reported in 2006.

**Table 1: Rubella case counts by year**

	2016*	2015	2014	2013	2012	2011	Total
Saskatchewan	0	0	0	0	0	0	0
Canada	N/A	N/A	1	2	2	2	7

\*preliminary counts  
N/A = not available

**Table 2: Rubella case characteristics, 2011-2015**

Characteristics of rubella cases – Saskatchewan 2011 - 2015		Cases	Percent of Cases
Total		0	0
Sex	Male	0	0
	Female	0	0
Age	Less than 1 year	0	0
	1 - 4 years	0	0
	5 - 19 years	0	0
	20 - 49 years	0	0
	50 years and over	0	0
Hospitalized	Yes	0	0
	No	0	0
	Unknown	0	0
Immunization status for rubella vaccine	2 doses	0	0
	1 dose	0	0
	0 dose	0	0
	Too young	0	0
	Unknown	0	0
Source	International	0	0
	Canada	0	0
	Saskatchewan	0	0
Provincial source (n=0)	Domestic Travel	0	0
	Epidemiologically-linked to travel case	0	0
	Epidemiologically-linked to case with unknown source	0	0
	No identified source	0	0
Genotype**	Unknown	0	0

\*\*Laboratory analyses can identify different genotypes of rubella which may help identify whether the virus was imported or possibly related to other cases.

## Rubella Coverage in Saskatchewan: 2012 to 2016

- From 2012 to 2016, provincial immunization coverage rates improved up to and including 5 years of age, while the rate declined for children seven to 15 years of age.
- From 2013 to 2016, the coverage rate declined for 17-year-old teens (the 2012 rate is unreliable and should not be compared with later years).

**Table 3: Rubella vaccine coverage for Saskatchewan by year, 2012-2016**

Age	Doses	2016	2015	2014	2013	2012
13 months	1	58.5%	59.5%	59.1%	55.0%	54.9%
18 months	1	84.4%	82.8%	84.3%	83.1%	83.6%
19 months	2	46.5%	46.4%	45.7%	43.6%	44.3%
24 months	1	88.6%	87.9%	88.4%	89.0%	88.2%
	2	76.3%	73.4%	75.6%	75.7%	74.7%
5 years	1	93.3%	91.2%	93.4%	92.8%	92.7%
	2	87.8%	84.6%	88.0%	87.0%	86.2%
7 years	2	90.2%	88.5%	90.7%	91.2%	91.1%
13 years	2	93.1%	92.6%	94.6%	94.7%	95.0%
15 years	2	94.8%	94.0%	95.7%	96.2%	96.3%
17 years	2	94.5%	94.9%	96.2%	96.3%	87.1%^

^Immunization records may be incomplete for children born prior to 1996. Therefore, the 2012 coverage rate for 17-year-old adolescents may not reflect actual provincial or RHA rates.

# EPIDEMIOLOGY SUMMARY

**Table 4: Rubella Vaccine Coverage by Health Region, 2016**

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	2 doses	1 dose	2 doses	1 dose	2 doses	2 doses	2 doses	2 doses	2 doses
<b>Saskatchewan</b>	<b>58.5</b>	<b>84.4</b>	<b>46.5</b>	<b>88.6</b>	<b>76.3</b>	<b>93.3</b>	<b>87.8</b>	<b>90.2</b>	<b>93.1</b>	<b>94.8</b>	<b>94.5</b>
<b>Peer Group A</b>											
Regina Qu'Appelle	52.8	82.0	43.9	87.0	75.1	93.5	87.1	90.2	93.6	95.6	94.0
Saskatoon	60.2	86.9	48.1	90.7	79.9	93.3	88.0	89.8	92.7	95.2	94.4
<b>Peer Group D</b>											
Cypress	64.0	87.4	56.4	93.7	88.0	94.6	92.3	92.6	95.0	95.2	96.0
Five Hills	69.5	88.5	48.7	88.2	75.7	93.1	86.3	91.3	94.3	95.3	95.9
Heartland	64.0	89.6	53.3	92.1	80.8	96.9	92.4	93.6	93.9	94.4	96.7
Kelsey Trail	69.9	86.9	53.3	90.2	77.2	92.4	87.7	91.6	95.7	95.8	95.4
Sun Country	75.1	92.5	65.5	93.9	88.7	96.6	94.2	94.0	96.9	98.1	97.4
Sunrise	65.4	82.1	49.0	86.8	73.1	94.5	89.0	90.6	94.7	96.1	96.7
<b>Peer Group F</b>											
Athabasca Health Authority	61.1	94.4	31.6	91.4	82.9	96.9	96.9	97.8	87.2	90.0	92.2
Keewatin Yatthé	41.9	75.2	17.3	83.9	56.5	92.6	87.3	88.6	96.6	94.7	94.2
Mamawetan Churchill River	45.7	78.4	28.3	86.2	64.1	94.0	87.5	89.5	87.5	91.7	86.6
<b>Peer Group H</b>											
Prairie North	50.5	77.5	38.6	85.5	68.7	89.0	82.6	87.3	89.6	91.3	94.0
Prince Albert Parkland	49.6	77.3	35.6	81.1	60.8	92.2	86.0	86.7	90.8	90.9	93.1

**Table 5: Rubella Vaccine Coverage by Health Region, 2015**

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	2 doses	1 dose	2 doses	1 dose	2 doses	2 doses	2 doses	2 doses	2 doses
<b>Saskatchewan</b>	<b>59.5</b>	<b>82.8</b>	<b>46.4</b>	<b>87.9</b>	<b>73.4</b>	<b>91.2</b>	<b>84.6</b>	<b>88.5</b>	<b>92.6</b>	<b>94.0</b>	<b>94.9</b>
<b>Peer Group A</b>											
Regina Qu'Appelle	61.5	82.6	51.7	87.0	73.1	90.0	82.6	88.0	92.6	94.3	94.2
Saskatoon	60.1	83.7	46.8	88.7	75.6	90.3	82.8	88.2	92.0	94.1	95.2
<b>Peer Group D</b>											
Cypress	69.3	88.6	56.4	91.3	78.2	94.9	90.3	92.1	94.8	95.2	95.6
Five Hills	60.8	82.3	42.6	88.7	69.9	92.1	85.6	92.3	95.0	93.7	96.8
Heartland	61.7	86.9	46.0	91.9	80.1	95.7	91.9	93.6	93.7	95.6	96.0
Kelsey Trail	54.5	84.6	39.5	87.9	72.6	95.1	90.8	89.9	96.1	94.1	94.5
Sun Country	71.5	91.1	59.9	93.6	84.5	97.5	94.4	91.3	96.3	96.3	96.6
Sunrise	58.1	83.9	44.6	87.3	73.8	91.5	86.2	88.2	93.0	95.0	96.1
<b>Peer Group F</b>											
Athabasca Health Authority	79.4	85.3	58.1	94.1	82.4	93.6	91.5	94.7	81.6	92.5	97.0
Keewatin Yatthé	45.0	74.7	23.0	86.1	60.0	88.3	86.2	88.3	95.0	88.4	94.5
Mamawetan Churchill River	45.5	80.1	31.3	87.0	67.8	92.8	86.0	89.3	94.0	91.0	91.6
<b>Peer Group H</b>											
Prairie North	53.9	78.3	37.2	85.6	68.2	89.0	81.1	85.5	89.0	92.0	94.4
Prince Albert Parkland	45.1	72.3	31.1	81.3	60.8	91.0	85.1	85.7	90.1	92.9	93.5

- Two years of coverage data in 11 age-dose categories are provided by RHA. Yellow highlight indicates RHAs below the provincial coverage rate.
- At the provincial level, coverage from 2015 to 2016 declined at 13 months from 59.5% to 58.5% and at 17 years from 94.9% to 94.5%.
- Other rates showed modest improvements for ages up to and including 15 years.
- At 13 months, five years (one dose), seven years and 13 years of age for 2016, eight RHAs exceeded the provincial average and five were below.
- For 2016, the one-dose coverage rate was higher among the 18-month age group compared to the 13-month age group: 84.4% vs. 58.5%. The two-dose coverage rate for the 24-month age group was also higher than the 19-month age group: 76.3% vs. 46.5%.
- In 2016 two RHAs were below the provincial rate in all eleven age-dose categories and two were below in ten categories.
- In 2016 two RHAs were at or above the provincial rate in all eleven age-dose categories and one was at or above the provincial average in all but one category.
- Coverage rates for health regions in Peer Groups F and H should be interpreted with caution (see Data Notes).

# SURVEILLANCE CASE DEFINITION: Saskatchewan CDC Manual

## Respiratory and Direct Contact Rubella



Photo Courtesy of Centers for Disease Control

### Notification Timeline:

**From Lab/Practitioner to Public Health:** Within 48 hours  
(or immediate if an outbreak is suspected).

**From Public Health to Ministry of Health:** Within 72 hours  
(or immediate if an outbreak is suspected).

**Public Health Follow-up Timeline:** Initiate within 24-48 hours.

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

#### Confirmed Case

Laboratory confirmation of infection in the absence of recent immunization with rubella containing vaccine:

- isolation of rubella virus from an appropriate clinical specimen  
**OR**
- detection of rubella virus RNA  
**OR**
- seroconversion or a significant (e.g., fourfold or greater) rise in rubella IgG titre by any standard serologic assay between acute and convalescent sera  
**OR**
- positive serologic test for rubella IgM antibody using a recommended assay in a person with an epidemiologic link to a laboratory-confirmed case or who has recently travelled to an area of known rubella activity.

**OR**

Clinical illness<sup>1</sup> in a person with an epidemiologic link to a laboratory-confirmed case.

#### Probable Case

Clinical illness<sup>1</sup>

- in the absence of appropriate laboratory tests  
**OR**
- in the absence of an epidemiologic link to a laboratory-confirmed case  
**OR**
- in a person who has recently travelled to an area of known rubella activity.

<sup>1</sup>Clinical illness is characterized by fever and rash, and at least one of the following:

- arthralgia/arthritis;
- lymphadenopathy;
- conjunctivitis.

## DATA NOTES

Case Data Source: The Saskatchewan Integrated Public Health Information System (iPHIS) is a provincially mandated integrated client-centered case management information system that supports public health surveillance. Confirmed cases must meet the provincial surveillance case definition.

Rubella molecular epidemiology is a tool for tracking rubella virus importations, establishing whether connections exist between concurrent rubella cases or outbreaks, and demonstrating the absence of sustained rubella transmission. Genotyping is performed by the National Medical Laboratory.

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) 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.

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.

Panorama's immunization module replaced the former 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).

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 First Nations (FN) children are missing or are incomplete. This report includes only those children with Saskatchewan health coverage and registered in 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).

Prairie North and Prince Albert Parkland health regions have higher aboriginal populations 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. This means this report does not include coverage statistics for the entire provincial or regional populations.

The rubella vaccine is currently administered as measles, mumps, rubella and varicella (MMRV) or measles, mumps and rubella (MMR) 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 rate for seven-year-old children in 2016 is based on clients who were born in 2009 and the immunization doses they received by their seventh birthdays.