

# Vaccine Preventable Disease Monitoring Report Tetanus, 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. Tetanus 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

Tetanus (also known as "lock jaw") is a bacterial disease, which affects the nerves that control the muscles. The bacteria release a toxin that causes muscle spasms. It may be localized (involving only the nerves of the affected muscle) or generalized (affecting the nervous system more broadly). The most common initial sign is spasms of the jaw muscles. Other symptoms include headache, seizures, fever and sweating, high blood pressure and fast heart rate. Mortality rates range from about 10% to 20%.

The time from exposure to symptoms (incubation period) is about three to 21 days. The incubation period can be shorter when there is heavy contamination of a wound (such as in burns, crush injuries or injuries with dead tissue).

Tetanus is caused by the bacterium, *Clostridium tetani*.

The bacteria are found in the environment (in soil, dust, saliva and feces). The bacteria enter the body through breaks in the skin, usually through cuts or puncture wounds caused by contaminated objects or when injuries become contaminated with the bacteria. It is not spread from person to person.

Tetanus is rare in Canada. Between 1990 and 2010, the number of cases reported annually ranged from one to 10, with an average of four per year. Only eight deaths due to tetanus have been reported in Canada since 1990. Globally 10,337 tetanus cases were reported in 2015. The World Health Organization (WHO) estimated that in 2011, 72,600 deaths in children less than five years of age were due to tetanus.

## Immunization

Tetanus toxoid is only available in combination vaccines. The Saskatchewan Routine Childhood Immunization Schedule recommends a four-dose primary series of tetanus toxoid-containing vaccine at two, four, six and 18 months of age, and boosters at four to six years of age and Grade 8. A booster dose of tetanus toxoid-containing vaccine is recommended for adults every 10 years.

Tetanus is extremely rare in fully immunized people whose last dose was within the last 10 years. If tetanus

does occur in fully vaccinated people, the disease is usually mild. Many Canadians, especially those who are older or born outside of Canada, do not have protective levels of tetanus antibodies and are at risk of acquiring the disease.

The efficacy of tetanus toxoid-containing vaccine following the primary series is estimated to be more than 99%, but there is declining immunity over time. Therefore, booster doses are recommended every 10 years.

## Surveillance

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

Notifiable diseases may be undetected, therefore under-reported, due to a number of factors including lack of contact with the health care system or the inability of laboratory tests to identify the organism. Some communicable diseases occur rarely and therefore, rates

are based on small numbers of cases which can fluctuate dramatically over time. In these situations, 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 cases.

Currently molecular epidemiology genotyping is not available for tetanus.

# EPIDEMIOLOGY AND VACCINE COVERAGE SUMMARIES

## Tetanus in Saskatchewan: 2015

- No (0) cases of lab-confirmed tetanus were reported.
- No cases were hospitalized.
- There were no deaths from tetanus.

Table 1: Tetanus case counts by year

	2016*	2015	2014	2013	2012	2011	Total
Saskatchewan	0	0	0	0	0	0	0
Canada	N/A	N/A	5	2	3	2	12

\*preliminary counts  
N/A = not available

## Tetanus in Saskatchewan: 2011 to 2015

- No (0) cases of lab-confirmed tetanus were reported.
- No cases were hospitalized.
- There were no deaths from tetanus.

Table 2: Tetanus case characteristics, 2011-2015

Characteristics of tetanus 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 tetanus vaccine	5 doses	0	0
	0 dose	0	0
	Too young	0	0
	Unknown	0	0
Source	International	0	0
	Canada	0	0
	Saskatchewan	0	0
Genotype	Unknown	0	0

## Tetanus Coverage in Saskatchewan: 2012 to 2016

- From 2012 to 2016, provincial immunization coverage rates improved up to and including five 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: Tetanus vaccine coverage for Saskatchewan, 2012-2016

Age	Doses	2016	2015	2014	2013	2012
3 months	1	85.0%	85.0%	84.2%	83.4%	83.1%
5 months	2	77.0%	76.0%	73.8%	73.9%	72.4%
8 months	3	78.8%	77.4%	76.4%	75.8%	74.8%
12 months	3	85.6%	84.9%	84.7%	84.5%	84.7%
20 months	3	89.1%	88.5%	88.8%	89.2%	88.8%
	4	60.9%	60.5%	60.2%	59.2%	59.7%
24 months	3	90.0%	89.3%	89.8%	90.5%	89.4%
	4	76.8%	74.6%	75.7%	76.4%	75.5%
5 years	4	87.7%	85.2%	87.9%	87.3%	87.2%
7 years	5	76.4%	75.0%	78.0%	78.5%	77.7%
13 years	5	77.5%	78.3%	80.8%	81.2%	83.0%
15 years	6	68.2%	67.7%	72.9%	73.8%	73.9%
17 years	6	71.4%	72.0%	75.2%	76.2%	68.8%^

^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.

# VACCINE COVERAGE SUMMARIES

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

Health Region, by Peer Group	Vaccine coverage (% immunized), by age and dose												
	3 months	5 months	8 months	12 months	20 months		24 months		5 years	7 years	13 years	15 years	17 years
	1 dose	2 doses	3 doses	3 doses	3 doses	4 doses	3 doses	4 doses	4 doses	5 doses	5 doses	6 doses	6 doses
<b>Saskatchewan</b>	<b>85.0</b>	<b>77.0</b>	<b>78.8</b>	<b>85.6</b>	<b>89.1</b>	<b>60.9</b>	<b>90.0</b>	<b>76.8</b>	<b>87.7</b>	<b>76.4</b>	<b>77.5</b>	<b>68.2</b>	<b>71.4</b>
<b>Peer Group A</b>													
Regina Qu'Appelle	87.0	78.5	79.8	85.3	87.4	58.4	89.0	75.0	86.4	76.2	74.7	67.5	68.8
Saskatoon	83.9	76.1	77.8	85.9	91.0	63.3	91.4	80.8	87.8	74.6	75.1	69.3	70.6
<b>Peer Group D</b>													
Cypress	87.1	80.6	82.6	88.6	93.2	71.2	94.9	87.8	92.7	82.0	84.5	76.6	78.3
Five Hills	89.1	80.0	83.2	89.2	90.5	63.6	90.2	77.2	87.3	78.4	84.1	71.6	80.3
Heartland	88.6	79.9	83.0	90.8	93.5	68.6	93.5	82.6	93.2	83.1	86.9	80.1	84.8
Kelsey Trail	86.2	77.5	82.7	88.9	90.4	66.4	90.9	76.7	87.5	81.0	82.1	72.9	75.8
Sun Country	90.3	89.6	92.0	93.8	94.4	78.3	94.5	88.8	94.5	85.0	86.4	79.9	84.2
Sunrise	87.6	82.5	83.5	86.3	88.9	60.4	90.1	73.9	89.3	81.8	81.5	76.3	78.3
<b>Peer Group F</b>													
Athabasca Health Authority	90.2	65.9	70.3	88.2	94.4	55.6	94.3	82.9	96.9	92.3	78.7	46.0	62.7
Keewatin Yatthé	66.7	55.0	56.4	70.5	79.5	35.5	82.0	54.7	83.1	72.3	82.1	35.3	55.8
Mamawetan Churchill River	74.6	63.3	61.9	77.9	86.8	42.9	89.2	66.2	85.5	71.0	76.4	43.0	50.0
<b>Peer Group H</b>													
Prairie North	83.1	74.7	76.2	80.8	85.1	52.0	86.4	69.0	83.5	71.8	72.8	56.5	62.7
Prince Albert Parkland	76.2	64.1	66.0	78.2	82.0	48.3	82.9	61.0	85.8	70.5	77.2	60.5	67.6

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

Health Region, by Peer Group	Vaccine coverage (% immunized), by age and dose												
	3 months	5 months	8 months	12 months	20 months		24 months		5 years	7 years	13 years	15 years	17 years
	1 dose	2 doses	3 doses	3 doses	3 doses	4 doses	3 doses	4 doses	4 doses	5 doses	5 doses	6 doses	6 doses
<b>Saskatchewan</b>	<b>85.0</b>	<b>76.0</b>	<b>77.4</b>	<b>84.9</b>	<b>88.5</b>	<b>60.5</b>	<b>89.3</b>	<b>74.6</b>	<b>85.2</b>	<b>75.0</b>	<b>78.3</b>	<b>67.7</b>	<b>72.0</b>
<b>Peer Group A</b>													
Regina Qu'Appelle	85.7	77.0	78.1	84.5	88.5	64.0	88.7	75.0	83.8	74.3	75.4	66.9	69.0
Saskatoon	84.8	77.7	78.4	86.0	88.9	61.3	89.8	76.7	83.7	73.9	76.3	68.6	72.9
<b>Peer Group D</b>													
Cypress	85.1	74.1	81.0	90.7	91.7	71.0	92.6	80.1	90.5	82.5	83.9	78.0	79.0
Five Hills	88.6	79.5	78.9	85.6	90.2	54.8	90.6	73.3	86.3	77.2	85.7	73.5	74.3
Heartland	86.8	80.6	84.5	91.5	91.7	66.3	92.2	80.9	92.5	85.7	86.7	79.8	80.8
Kelsey Trail	85.1	77.1	80.9	88.5	90.8	55.7	89.8	71.6	91.8	77.6	84.4	71.6	78.1
Sun Country	93.2	88.4	89.9	92.7	94.5	74.2	94.9	85.0	94.4	80.9	89.2	80.0	83.1
Sunrise	82.2	74.7	78.3	85.5	90.9	63.7	89.5	74.2	86.3	79.0	82.5	68.3	77.3
<b>Peer Group F</b>													
Athabasca Health Authority	82.4	59.0	66.7	88.6	100.0	69.7	100.0	85.3	91.5	78.9	75.5	56.6	78.8
Keewatin Yatthé	65.3	46.6	47.6	68.9	75.6	39.3	82.8	58.9	83.0	73.5	84.4	37.0	61.4
Mamawetan Churchill River	80.4	58.1	63.2	81.0	84.2	43.3	87.6	65.5	83.9	70.6	78.2	41.8	57.4
<b>Peer Group H</b>													
Prairie North	84.2	69.6	70.9	80.5	84.7	52.8	87.3	69.6	81.1	66.9	71.7	55.6	64.1
Prince Albert Parkland	78.5	63.6	64.2	73.6	81.3	43.3	83.2	60.7	84.0	72.9	75.4	64.3	66.7

- Two years of coverage data in 13 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 years from 78.3% to 77.5% and at 17 years from 72.0% to 71.4%. Coverage remained unchanged at the age of three months.
- Other rates showed modest improvements for ages up to and including 15 years.
- At three months, 12 months, 24 months (three doses) and 13 years of age for 2016, eight RHAs exceeded the provincial average and five were below.
- For 2016, four-dose coverage rate improved from 60.9% at the age of 20 months to 76.8% at 24 months to 87.7% at five years.
- In 2016, three RHAs were below the provincial rate in all 13 age-dose categories and one was below in 12 categories.
- In 2016, three RHAs were at or above the provincial rate in all 13 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

## Tetanus



Photo Courtesy of Centers for Disease Control

\*Clinical illness is characterized by acute onset of hypertonia and/or painful muscular contractions (usually of the muscles of the jaw and neck), and generalized muscle spasms without other apparent medical cause.

### Notification Timeline:

**From Lab/Practitioner to Public Health:** Immediate.

**From Public Health to Ministry of Health:** Within 2 weeks.

**Public Health Follow-up Timeline:** Initiate within 72 hours.

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

### Confirmed Case

Clinical evidence of illness\* with or without other apparent medical cause with or without isolation of *Clostridium tetani* and with or without history of injury

## 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.

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](http://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.

The four-dose primary series of tetanus toxoid-containing vaccine is administered as diphtheria, tetanus, acellular pertussis, inactivated polio & *Haemophilus influenzae* type B (DTaP-IPV-Hib). The first booster at four to six years of age is DTaP-IPV vaccine and the second booster at Grade 8 is tetanus, diphtheria & acellular pertussis (Tdap) vaccine. Immunization coverage is based on those who turned three, five, eight, 12, 20 and 24 months, and four, seven, 13, 15 and 17 years by December 31 in 2015 and 2016. For example, the immunization coverage for seven-year-old children in 2016 is based on children who were born in 2009 and the immunization doses they received by their seventh birthdays.