

# Vaccine Preventable Disease Monitoring Report

## Meningococcal serogroup C, 2014

Report release date: September, 2016

### **Purpose:**

The Saskatchewan Ministry of Health's Population Health Branch provides routine surveillance of notifiable diseases at the provincial, regional health authority (RHA), 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 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 provincial Chief and Deputy Chief Medical Health Officers. Meningococcal serogroup C is a Category I disease.

### **Report Features:**

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

### **Prepared by:**

Population Health Branch,  
Saskatchewan Ministry of Health.

### **Contact:**

Val Mann, PhD  
Chief Population Health  
Epidemiologist,  
Population Health Branch,  
Saskatchewan Ministry of Health  
email: [cdc@health.gov.sk.ca](mailto:cdc@health.gov.sk.ca)

## **Background**

Invasive meningococcal disease (IMD) is caused by the *N. meningitidis* bacteria. It usually results in meningitis (50%) or bacteremia (35%-40%) or both. There are several strains of *N. meningitidis*, but those most common include A, B, C, Y and W-135. The meningococcal serogroup C immunization program has virtually eliminated cases of meningococcal serogroup C. Saskatchewan continues to see rare cases of meningococcal serogroup B and other serogroups. A universal meningococcal serogroup B immunization program is currently not recommended by the National Advisory Committee on Immunization (NACI).

Universal immunization programs target infants and adolescents who are at greatest risk. Individuals with certain risk factors such as immune-compromising conditions are eligible to receive additional doses of meningococcal vaccines. The bacterium is spread

through direct contact with respiratory secretions. The incubation period is usually within three to four days of exposure but can be as long as 10 days. *N. meningitidis* has the potential to cause large epidemics with serious complications.

Every case of IMD results in intensive public health follow-up to treat and vaccinate individual contacts that are at high risk of infection. Timely implementation of these efforts can avert an outbreak.

Overall, approximately 10%-15% will not survive infection with IMD; this number is higher in adolescents. Of the survivors, 11-19% may suffer hearing loss, neurologic disability or limb amputations. Additional subtle neurological deficits such as behavioral problems, school performance or attention deficit disorder may also be experienced by survivors.

## **Immunization**

The Saskatchewan Routine Childhood Immunization Schedule currently recommends a meningococcal serogroup C-containing vaccine at 12 months and Grade 6. Prior to October 1, 2000, a single dose at Grade 6 was provided. Currently the two products used in Saskatchewan are meningococcal conjugate C (Men-C-C) and meningococcal conjugate ACYW-135 (Men-C-ACYW-135). The schedule varies by product and birth year of the child:

### **Men-C-C vaccine**

- Those born between January 1, 1993 and September 30, 2000 are eligible to receive one dose of Men-C-C vaccine, offered in Grade 6 or 11 years of age and are

eligible to receive it until under 22 years of age.

- Those born on or since October 1, 2000 are eligible for one dose of Men-C-C vaccine, offered at 1 year of age and are eligible to receive it until under 10 years of age. At least one dose must be administered when the child is 12 months or older.

### **Men-C-ACYW-135 vaccine**

- Those born on or since January 1, 2000 are eligible for one dose of Men-C-ACYW-135 vaccine offered in Grade 6 and are eligible to receive it until under 22 years of age. The minimum age for this Grade 6 dose is 10 years of age.

## **Surveillance**

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

Standard case definitions allow comparability of surveillance data. These definitions should not be misinterpreted as a clinical diagnosis.

IMD occurs infrequently but seldom goes undetected since the severity of symptoms brings cases into contact with the health care system. IMD case rates, based on small numbers of cases, fluctuate over time. Year to year comparisons should be interpreted with caution.

No genomic sequencing of the *N. meningitidis* C strain has been published in the International Nucleotide Sequence Database Collaboration.

# EPIDEMIOLOGY AND VACCINE COVERAGE SUMMARIES

## Meningococcal serogroup C in Saskatchewan: 2014

- No (0) cases of lab-confirmed invasive meningococcal serogroup C were reported.
- No cases were hospitalized.
- There were no deaths from invasive meningococcal serogroup C.

## Meningococcal serogroup C in Saskatchewan: 2011 to 2014

- No (0) cases of lab-confirmed cases of invasive meningococcal serogroup C were reported during this time period.
- The most recent report of meningococcal serogroup C was one case reported in 2010.

**Table 1: Meningococcal serogroup C case counts by year**

	2015*	2014	2013	2012	2011	Total
Saskatchewan	0	0	0	0	0	0
Canada**	N/A	N/A	N/A	N/A	N/A	N/A

\*preliminary counts to date, April 2016

\*\*Public Health Agency of Canada (PHAC) publishes total counts for all meningococcal serotypes, none specific for serogroup C

N/A = not available

**Table 2: Meningococcal serogroup C case characteristics, 2011-2014**

Characteristics of meningococcal serogroup C cases – Saskatchewan 2011 - 2014		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 meningococcal vaccine	Up to date	0	0
	No	0	0
	Unknown	0	0
Source	International	0	0
	Canada	0	0
	Saskatchewan	0	0
Provincial source	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
Subtype	Unknown	0	0

**Table 3: Meningococcal serogroup C vaccine coverage for Saskatchewan by year**

Age	Doses	2014	2013	2012
13 months	1	59.0%	55.9%	56.2%
20 months	1	86.1%	85.8%	85.7%
24 months	1	87.8%	88.9%	87.8%
5 years	1	92.4%	91.9%	91.3%
7 years	1	93.1%	93.3%	93.0%
13 years	1	93.7%	89.5%	88.4%
	2	79.2%	26.6%*	N/A
15 years	1	91.2%	90.8%	91.2%
17 years	1	91.3%	91.6%	82.7%**

\*The two-dose coverage rate in 2013 was quite low because only those born during the last three months of 2000 would have been eligible.

\*\*Immunization records may be incomplete for children born prior to 1996; therefore, the coverage for 17-year-old adolescents may not reflect the actual provincial rate.

N/A = not available

# VACCINE COVERAGE SUMMARIES

**Table 4: Meningococcal serogroup C Vaccine Coverage by Health Region, 2014**

Health Region, by Peer Group	Vaccine coverage (% immunized), by age and dose								
	13 months	20 months	24 months	5 years	7 years	13 years		15 years	17 years
	1 dose	1 dose	1 dose	1 dose	1 dose	1 dose	2 doses	1 dose	1 dose
<b>Saskatchewan</b>	59.0	86.1	87.8	92.4	93.1	93.7	79.2	91.2	91.3
<b>Peer Group A</b>									
Regina Qu'Appelle	59.3	85.3	86.5	91.8	94.3	94.2	81.5	91.9	92.1
Saskatoon	62.7	87.3	89.2	92.9	93.0	93.2	79.3	92.4	92.4
<b>Peer Group D</b>									
Cypress	59.0	87.4	90.3	95.4	96.2	95.1	87.2	93.7	96.2
Five Hills	61.6	87.5	88.5	92.3	93.1	95.3	81.1	93.7	95.5
Heartland	64.6	89.9	91.6	93.6	94.0	95.6	87.0	95.1	95.9
Kelsey Trail	50.1	83.0	86.6	91.4	90.9	93.4	77.4	91.4	89.5
Sun Country	68.6	88.9	91.3	93.8	96.4	97.3	88.3	96.1	95.3
Sunrise	57.8	85.5	86.5	91.6	90.3	96.0	76.5	93.0	92.5
<b>Peer Group F</b>									
Athabasca Health Authority	80.0	97.7	97.8	100.0	95.4	96.2	61.5	98.1	96.6
Keewatin Yatthé	47.3	93.3	92.7	99.4	99.3	98.3	82.6	79.1	88.8
Mamawetan Churchill River	54.6	90.2	91.9	97.2	96.4	95.2	70.8	77.5	72.8
<b>Peer Group H</b>									
Prince Albert Parkland	43.0	80.6	83.8	90.3	89.7	89.3	70.4	85.3	84.3
Prairie North	53.5	82.1	82.9	89.8	89.4	90.8	69.5	85.6	84.8

**Table 5: Meningococcal serogroup C Vaccine Coverage by Health Region, 2013**

Health Region, by Peer Group	Vaccine coverage (% immunized), by age and dose								
	13 months	20 months	24 months	5 years	7 years	13 years		15 years	17 years
	1 dose	1 dose	1 dose	1 dose	1 dose	1 dose	2 doses	1 dose	1 dose
<b>Saskatchewan</b>	55.9	85.8	88.9	91.9	93.3	89.5	26.6	90.8	91.6
<b>Peer Group A</b>									
Regina Qu'Appelle	56.3	85.5	88.3	91.3	94.0	90.3	24.1	92.3	93.3
Saskatoon	58.2	86.8	90.3	92.0	93.7	90.7	28.5	91.6	92.6
<b>Peer Group D</b>									
Cypress	56.7	87.4	90.2	95.8	93.0	93.6	28.7	93.4	93.8
Five Hills	60.0	87.8	91.1	92.8	94.8	90.5	24.4	92.6	94.8
Heartland	63.7	89.4	91.1	94.3	95.4	92.5	34.2	92.9	95.6
Kelsey Trail	50.4	84.6	85.7	89.5	90.0	86.7	22.0	89.4	90.8
Sun Country	70.7	92.6	92.7	94.4	97.3	94.0	26.4	94.9	96.8
Sunrise	53.5	83.1	87.3	92.1	93.4	89.7	24.2	92.2	92.3
<b>Peer Group F</b>									
Athabasca Health Authority	69.6	97.7	100.0	96.6	94.6	89.8	22.0	91.9	89.6
Keewatin Yatthé	52.8	89.6	95.9	94.9	93.6	84.8	31.3	90.1	89.0
Mamawetan Churchill River	50.0	90.3	94.7	93.8	87.4	74.6	21.1	74.8	71.4
<b>Peer Group H</b>									
Prince Albert Parkland	39.9	79.8	83.9	91.1	91.0	85.3	24.4	84.8	85.0
Prairie North	47.2	79.5	82.9	89.2	89.8	84.4	30.8	85.9	85.1

**Table 6: Meningococcal serogroup C Vaccine Coverage by Health Region, 2012**

Health Region, by Peer Group	Vaccine coverage (% immunized), by age and dose								
	13 months	20 months	24 months	5 years	7 years	13 years	15 years	17 years*	
	1 dose	1 dose	1 dose	1 dose	1 dose	1 dose	1 dose	1 dose	1 dose
<b>Saskatchewan</b>	56.2	85.7	87.8	91.3	93.0	88.4	91.2	82.7	
<b>Peer Group A</b>									
Regina Qu'Appelle	58.3	86.0	88.0	89.9	94.2	89.4	92.3	52.0	
Saskatoon	58.2	86.2	87.5	92.9	92.7	89.9	92.6	91.5	
<b>Peer Group D</b>									
Cypress	52.4	87.6	90.8	93.1	95.0	92.4	96.1	94.5	
Five Hills	56.3	88.1	90.0	93.2	93.4	91.3	95.6	95.2	
Heartland	56.0	89.8	90.3	93.3	96.5	94.3	96.1	94.2	
Kelsey Trail	53.2	86.0	87.9	87.5	91.1	89.6	89.4	90.6	
Sun Country	65.0	92.9	94.2	95.0	96.7	94.0	95.3	93.4	
Sunrise	55.8	85.2	89.5	90.0	92.9	91.1	93.1	91.3	
<b>Peer Group F</b>									
Athabasca Health Authority	72.5	90.9	92.6	92.6	97.1	76.9	93.1	81.4	
Keewatin Yatthé	51.2	90.2	90.3	97.4	97.7	65.7	86.0	85.2	
Mamawetan Churchill River	43.2	84.9	88.5	86.4	82.7	67.1	66.5	72.5	
<b>Peer Group H</b>									
Prince Albert Parkland	41.8	79.9	82.8	89.1	91.8	81.6	83.5	86.2	
Prairie North	52.4	78.2	82.8	88.1	88.4	81.9	84.6	86.4	

Three years of coverage data are provided by RHA. A yellow highlighted cell means the RHA's coverage rate is below the provincial coverage rate.

Since October 1, 2000 meningococcal serogroup C vaccine is recommended at 12 months of age and at Grade 6. Prior to October 1, 2000 it was recommended at Grade 6 only.

The adjacent tables report one-dose coverage rates for all ages and years except 13-year-old teens in 2012 and 2013, for whom one and two-dose coverage rates are presented. These are the only cohorts presented that are old enough by 2014 to have been eligible for doses at both 12 months of age and Grade 6. The younger cohorts are not yet eligible for their second dose and the older cohorts were eligible at Grade 6 only.

Overall coverage rates are the lowest at 13 months of age: between 55.9% and 59% at the provincial level. At 20 months, uptake had increased by 50.6% on average at the provincial level to a high of 86.1% in 2014.

For the cohort eligible to receive two doses of vaccine, not surprisingly the two-dose coverage rate in 2013 was quite low because only those born during the last three months of 2000 would have been eligible. In 2014 when a full cohort year (i.e., born in 2001) would have been eligible for two doses, the two-dose coverage rate for 13-year-old teens had improved to 79.2%.

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 Meningococcal Disease



Photo Courtesy of Centers for Disease Control/Dr. Gust

### Notification Timeline:

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

**From Public Health to Saskatchewan Health:** Within 72 hours.

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

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

<b>Confirmed Case</b>	<p>Clinical evidence<sup>1</sup> of invasive disease with laboratory confirmation of infection: isolation of <i>Neisseria meningitidis</i> from a normally sterile site (blood, CSF, joint, pleural or pericardial fluid)</p> <p><b>OR</b></p> <p>demonstration of <i>N. meningitidis</i> DNA by an appropriately validated nucleic acid test (NAT)<sup>2</sup> from a normally sterile site.</p>
<b>Probable Case</b>	<p>Clinical evidence<sup>1</sup> of invasive disease with purpura fulminans or petechiae, with no other apparent cause and with non-confirmatory laboratory evidence:</p> <ul style="list-style-type: none"> <li>• detection of <i>N. meningitidis</i> antigen in the CSF.</li> </ul>

<sup>1</sup>Clinical illness associated with invasive meningococcal disease usually manifests itself as meningitis and/or septicaemia, although other manifestations may be observed (e.g., orbital cellulitis, septic arthritis). Invasive disease may progress rapidly to petechiae or purpura fulminans, shock and death.

<sup>2</sup>Each jurisdiction will have a validation process for the NAT that they have in place.

## DATA NOTES

**Case Data Source:** The Saskatchewan Integrated Public Health Information System (iPHIS) is a provincially mandated integrated client-centred 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 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.

The meningococcal C-containing vaccine can be administered as individual vaccine specifically against strain C (Men-C) or in combination with vaccines against other meningococcal disease strains (i.e., Men-AC, Men-ACYW135, Men-C-ACYW135). Immunization coverage is based on who turned 3, 5, 8, 12, 20 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.