

Vaccine Preventable Disease Monitoring Report

Meningococcal serogroup C, 2015 and 2016

Report release date: July, 2017

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. 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

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Background

Invasive meningococcal disease (IMD) is caused by the *N. meningitidis* bacteria. IMD usually results in meningitis (50%), 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 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 further cases.

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 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: 2015

- 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.

Table 1: Meningococcal serogroup C case counts by year

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

*preliminary counts to date, December 2016

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

N/A = not available

Meningococcal serogroup C in Saskatchewan: 2011 to 2015

- 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 2: Meningococcal serogroup C case characteristics, 2011-2015

Characteristics of meningococcal serogroup C 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 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

Meningococcal serogroup C Coverage in Saskatchewan: 2012 to 2016

- From 2012 to 2016, provincial immunization coverage rates improved for one dose in all age groups except for seven-year-old children.
- 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: Meningococcal serogroup C vaccine coverage for Saskatchewan, 2012-2016

Age	Doses	2016	2015	2014	2013	2012
13 months	1	58.8%	60.0%	59.0%	55.9%	56.2%
20 months	1	86.1%	84.7%	86.1%	85.8%	85.7%
24 months	1	88.3%	87.0%	87.8%	88.9%	87.8%
5 years	1	92.5%	89.6%	92.4%	91.9%	91.3%
7 years	1	92.9%	91.4%	93.1%	93.3%	93.0%
13 years	1	93.6%	92.8%	93.7%	89.5%	88.4%
	2	80.1%	78.6%	79.2%	26.6%^	N/A
15 years	1	94.8%	90.9%	91.2%	90.8%	91.2%
	2	80.1%	27.4%^	N/A	N/A	N/A
17 years	1	90.9%	90.4%	91.3%	91.6%	82.7%^^

^ The two-dose coverage rate for 13-year-old teens in 2013 and 15-year-old teens in 2015 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 applicable because these birth cohorts were eligible for only one dose in Grade 6.

VACCINE COVERAGE SUMMARIES

Table 4: Meningococcal serogroup C Vaccine Coverage by Health Region, 2016

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	2 doses	1 dose
Saskatchewan	58.8	86.1	88.3	92.5	92.9	93.6	80.1	94.8	80.1	90.9
Peer Group A										
Regina Qu'Appelle	53.1	83.6	86.5	92.3	92.7	93.9	80.2	95.6	82.4	91.7
Saskatoon	60.5	88.5	90.2	92.5	93.0	93.4	80.6	95.5	80.6	92.0
Peer Group D										
Cypress	64.6	91.1	93.3	93.5	95.1	94.8	86.4	94.4	85.1	91.5
Five Hills	69.3	88.3	89.0	93.0	93.5	93.9	82.3	94.5	81.0	93.7
Heartland	64.9	90.2	90.8	95.9	95.1	95.8	85.2	94.6	85.5	94.9
Kelsey Trail	70.2	86.8	89.8	91.4	93.9	94.5	79.6	95.6	78.4	91.6
Sun Country	75.5	92.7	93.5	95.7	95.4	96.2	86.4	96.8	85.2	94.8
Sunrise	65.0	83.8	86.8	93.9	93.0	94.4	80.7	96.7	79.4	92.9
Peer Group F										
Athabasca Health Authority	58.3	97.2	91.4	96.9	100.0	97.9	85.1	100.0	80.0	100.0
Keewatin Yatthé	43.9	78.9	82.6	93.1	91.3	94.5	62.8	96.0	76.7	73.7
Mamawetan Churchill River	47.0	81.3	86.7	94.0	93.1	88.0	61.5	92.5	66.2	75.0
Peer Group H										
Prairie North	51.0	81.1	85.3	88.1	90.2	91.8	73.9	91.1	71.6	85.8
Prince Albert Parkland	50.0	80.6	81.6	91.6	90.7	91.6	78.3	90.3	73.6	87.3

Table 5: Meningococcal serogroup C Vaccine Coverage by Health Region, 2015

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	2 doses*	1 dose
Saskatchewan	60.0	84.7	87.0	89.6	91.4	92.8	78.6	90.9	27.4	90.4
Peer Group A										
Regina Qu'Appelle	61.7	84.2	86.1	88.0	90.8	92.8	79.5	91.2	24.7	91.4
Saskatoon	60.6	85.3	87.8	88.4	91.6	92.7	78.6	92.3	29.5	91.0
Peer Group D										
Cypress	70.6	88.2	90.7	93.9	94.1	93.3	83.7	93.2	28.6	92.3
Five Hills	61.9	85.2	87.7	91.5	92.8	94.5	80.7	91.0	25.7	91.6
Heartland	62.1	88.5	90.5	94.0	94.1	95.0	85.6	93.7	34.0	92.4
Kelsey Trail	55.7	87.4	86.0	93.4	92.4	96.5	80.7	91.7	23.5	91.8
Sun Country	71.3	91.9	92.8	95.5	92.0	95.2	86.2	92.2	25.4	92.6
Sunrise	58.7	86.4	86.2	89.8	91.1	92.6	75.7	92.0	24.7	92.1
Peer Group F										
Athabasca Health Authority	79.4	84.8	91.2	91.5	98.2	100.0	85.7	98.1	28.3	93.9
Keewatin Yatthé	46.8	80.4	86.1	88.8	90.7	88.7	71.6	79.5	28.1	86.9
Mamawetan Churchill River	46.0	81.9	85.9	91.8	95.2	92.7	66.1	77.2	21.3	77.1
Peer Group H										
Prairie North	54.1	81.1	85.1	87.8	89.1	89.4	70.0	86.7	31.7	86.2
Prince Albert Parkland	45.5	75.8	80.5	90.4	90.1	90.2	75.1	88.6	26.5	86.8

*For the first birth cohort eligible to receive two doses of vaccine, not surprisingly the two-dose coverage rate in 2015 was quite low because only those born in the last three months of 2000 would have been eligible. In 2016 when a full cohort (i.e., born in 2001) would have been eligible for two doses, the two-dose coverage rate for 15-year-old teens was much higher at 80.1%.

- Two 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 above tables report one-dose coverage rates for all ages and years except 13- and 15-year-old teens in 2015 and 2016, for whom one and two-dose coverage rates are presented. These are the only cohorts presented here that are old enough by the reporting period cut off 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.
- At the provincial level, immunization coverage improved from 2015 to 2016 for all age-dose categories, except for 13-month-old children.
- In 2016, the one-dose coverage rate was higher among the 20-month age group compared to the 13-month age group: 86.1% vs. 58.8%. It was even higher for the five-year-old age group at 92.5%.
- In 2016, one RHA reported coverage rates equal or above the provincial average for all age-dose categories and four RHAs were at or above the provincial average in all but one age-dose category.
- In 2016, two RHAs were below the provincial coverage in all ten age-dose categories.

SURVEILLANCE CASE DEFINITION: Saskatchewan CDC Manual

Respiratory and Direct Contact Meningococcal Disease

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)

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



Photo Courtesy of Centers for Disease Control/Mr. Gust

¹Clinical 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.
²Each 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-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.

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 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 those who turned three, five, eight, 12, 20 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 the immunization doses they received by their second birthdays.