

Vaccine Preventable Disease Monitoring Report

Haemophilus influenzae type b, 2017 and 2018

Release Date: December 2019

PREPARED BY POPULATION HEALTH BRANCH, SASKATCHEWAN MINISTRY OF HEALTH

FOR MORE INFORMATION CONTACT:

Val Mann, PhD
Chief Population Health Epidemiologist
Population Health Branch, Saskatchewan Ministry of Health
cdc@health.gov.sk.ca

<p><u>Purpose:</u></p> <p>The Saskatchewan Ministry of Health's Population Health Branch provides routine surveillance of notifiable diseases at the provincial, Athabasca Health Authority (AHA), former regional health authority (RHA), First Nations and Inuit Health Branch - Saskatchewan (FNIHB-SK) and Northern Inter-Tribal Health Authority (NITHA) levels.</p> <p>This report presents the most recent data for reportable communicable diseases as collected by Panorama and the Integrated Public Health Information System (iPHIS), and immunization coverage information as collected by Panorama. Limitations associated with these systems have been described elsewhere.</p> <p>Under <i>The Public Health Act, 1994</i> 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. <i>Haemophilus influenzae</i> type b is a Category I disease.</p>	<h2>Background</h2> <p><i>Haemophilus influenzae</i> type b (Hib) disease is a serious disease caused by bacteria. It is responsible for a wide range of localized and invasive infections. It usually affects children under five years old. It can also affect adults with certain medical conditions.</p> <p>Illnesses often caused by Hib include meningitis, epiglottitis, pneumonia, and bacteremia. Symptoms include fever, drowsiness, stiff neck, rapid or difficult breathing, sore throat, excessive irritability, or symptoms at the site of infection. Most cases are in children two months to four years of age. Before Hib vaccine, Hib disease was the leading cause of bacterial meningitis among children under five years old. Hib vaccines were first available in Saskatchewan in 1988.</p> <p>Hib is spread person to person from direct contact or droplet contact of oral or nasal secretions. People can harbor the bacteria and not develop illness (asymptomatic carriage). These individuals can transmit the bacteria to others, who may become ill.</p> <p>Adult cases are rare and illness usually occurs in those who also have a deficient immune system. A seasonal pattern of infection, peaking in September to December and March to May has been observed for meningitis.</p>
	<h2>Immunization</h2> <p>The Saskatchewan Routine Childhood Immunization Schedule recommends a three dose primary series of Hib-containing vaccine at two, four and six months of age and a booster dose at 18 months of age. At 15 months of age or older, a single dose of a Hib-containing vaccine is required for a previously unimmunized or incompletely immunized child up to and including 59 months of age. Although not routinely required for healthy children after 59 months of age (i.e., fifth birthday), Hib-containing vaccine is recommended for older children with congenital immunodeficiency, malignant hematologic disorders, HIV, anatomic or functional asplenia, and all transplant and cochlear implant recipients.</p> <p>More than 95% of infants develop protective antibody concentration upon completion of the primary series and booster dose. However, the efficacy of Hib-containing vaccine is unknown for persons with congenital or acquired immunodeficiency. The clinical efficiency of Hib vaccination has been estimated at 95-100%. Good vaccination coverage is required because a significant component of protection of children is associated with community immunity. Protection upon completion of age-appropriate immunization is long lasting, but the duration of immunity is not known.</p>
<p><u>Report Features:</u></p> <p>Background</p> <p>Epidemiological Summary</p> <p>Surveillance Case Definition</p> <p>Case Counts by Year</p> <p>Case Characteristics</p> <p>Vaccine Coverage by AHA and former RHA</p> <p><u>Data Source:</u></p> <p>Panorama (as of August 1, 2019)</p>	<h2>Surveillance</h2> <p>Under <i>The Public Health Act, 1994</i>, 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 Chief and Deputy Chief Medical Health Officers using the case definition in the Saskatchewan Communicable Disease Control Manual.</p> <p>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.</p> <p>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.</p>

EPIDEMIOLOGY AND VACCINE COVERAGE SUMMARY

Haemophilus influenzae type b (Hib) in Saskatchewan: 2018

- There were no cases of lab-confirmed Hib reported in 2018.

Table 1: Hib case counts by year

	2018	2017	2016	2015	2014	Total
Saskatchewan	0	1	1	0	1	3
Canada	N/A	19	12	27	26	84

N/A = not available

Haemophilus influenzae type b (Hib) in Saskatchewan: 2014 to 2018

- Three cases of Hib ranging in age from eight months to over 60 years were reported.
- All three cases were hospitalized.
- The one pediatric case was not immunized though eligible.
- None of the cases is known to have died.

Table 2: Hib case characteristics, Saskatchewan 2014-2018

		Cases	Percent of Cases
Total		3	100
Sex	Male	1	33
	Female	2	67
Age	Less than 1 year	1	33
	1 - 4 years	0	0
	5 - 19 years	0	0
	20 – 49 years	0	0
	50 years and over	2	67
Hospitalized	Yes	3	100
	No	0	0
	Unknown	0	0
Immunization status for Hib vaccine	2 doses	0	0
	1 dose	1	33
	0 dose	2	67
	Too young	0	0
	Unknown	0	0
Source	International	0	0
	Canada	0	0
	Saskatchewan	3	100
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	3	100
Genotype	Unknown	3	100

Haemophilus influenzae type b (Hib) Coverage in Saskatchewan: 2014 to 2018

- From 2014 to 2018, provincial immunization coverage rates improved for all the age-dose/up-to-date categories.

Table 3: Hib vaccine coverage rates for Saskatchewan by age, dose and year, 2014-2018

Age	Doses	2018	2017	2016 ^a	2015 ^a	2014 ^b
3 months	1	87%	86.1%	84.9%	84.9%	84.1%
5 months	2	78.3%	77.8%	76.9%	75.8%	73.7%
8 months	3	80.4%	79.2%	78.7%	77.1%	76.2%
12 months	Up-to-date	87%	86.2%	86%	85.2%	85%
20 months	Up-to-date	71.1%	66.7%	62.2%	61.4%	61.1%
24 months	Up-to-date	84.4%	81.3%	78.2%	75.4%	76.5%
59 months	Up-to-date	91%	88.7%	86.3%	83.7%	86.4%

^a Vaccine Preventable Disease Monitoring Report: Hib, 2015 and 2016 (Data source: Panorama January 12, 2017)

^b Vaccine Preventable Disease Monitoring Report: Hib, 2014 (Data source: SIMS January 16, 2015)

EPIDEMIOLOGY AND VACCINE COVERAGE SUMMARY

Table 4: Hib vaccine coverage by Athabasca Health Authority and former health region, 2018

Jurisdiction (with former health region by Peer Group)	Immunization coverage (% immunized), by age and dose						
	3 months 1 dose	5 months 2 doses	8 months 3 doses	12 months up-to-date	20 months up-to-date	24 months up-to-date	59 months up-to-date
Saskatchewan	87	78.3	80.4	87	71.1	84.4	91
Saskatchewan Health Authority	87	78.3	80.4	87	71.1	84.4	91
Peer Group A							
Regina Qu'Appelle	91.5	80	82.6	87.4	73.6	82.6	90.6
Saskatoon	83.4	77.5	79.3	87.1	67	85.3	88.5
Peer Group D							
Cypress	84	77.1	84	90.9	78.2	88.6	95.2
Five Hills	89.4	80.8	82.6	89.4	79.2	85.9	92.6
Heartland	90.1	83.9	82.4	90.7	78.2	89.1	95.6
Kelsey Trail	94	82.6	87.6	91.9	84.4	90.8	96.2
Sun Country	94.5	91.8	93.1	95.6	87.4	93	95.8
Sunrise	87.1	80.6	81.7	85.8	70.2	84.9	92.9
Peer Group F							
Athabasca Health Authority	85.3	71.4	82.1	100	76.7	80	96.8
Keewatin Yatthé	78.8	64.7	71.9	79.9	54.3	74.8	92
Mamawetan Churchill River	80	64.1	72.5	88	77	87.9	98.6
Peer Group H							
Prairie North	85.8	73.4	76	82.3	65.6	79.8	91.7
Prince Albert Parkland	82	68.3	66.5	78.1	60	77.6	91.1

Table 5: Hib vaccine coverage by Athabasca Health Authority and former health region, 2017

Jurisdiction (with former health region by Peer Group)	Immunization coverage (% immunized), by age and dose						
	3 months 1 dose	5 months 2 doses	8 months 3 doses	12 months up-to-date	20 months up-to-date	24 months up-to-date	59 months up-to-date
Saskatchewan	86.1	77.8	79.2	86.2	66.7	81.3	88.7
Saskatchewan Health Authority	86.1	77.8	79.2	86.2	66.8	81.3	88.7
Peer Group A							
Regina Qu'Appelle	87.3	78.8	79.6	86.6	64.6	78.2	87.9
Saskatoon	84.9	77.2	79.4	86	64.2	82	86.5
Peer Group D							
Cypress	88.4	79.2	79.7	87.9	74.8	86	94.3
Five Hills	88.5	82.6	81.7	86.2	72.7	83.3	90.2
Heartland	84.5	78.9	87	90	76	88.3	93.2
Kelsey Trail	90.1	84.4	89.3	92.6	78.2	88.9	93.1
Sun Country	94.2	90.3	90	93.3	85.5	90.7	94.2
Sunrise	84.5	79.4	82.8	88.5	72.2	81.8	89
Peer Group F							
Athabasca Health Authority	92	86.4	76.7	91.4	46.3	75	97.1
Keewatin Yatthé	76.7	57.2	53.1	71.6	53.1	75.6	94
Mamawetan Churchill River	83.8	70	67.8	81.2	71.9	85.1	97.8
Peer Group H							
Prairie North	84.9	74.2	74	82.6	63.6	76.9	87.4
Prince Albert Parkland	82.4	67.7	69.1	79.4	57.6	76.3	90.5

- Two years of coverage data in seven age-dose/up-to-date categories are provided by Athabasca Health Authority (AHA) and former RHA. A yellow highlighted cell means the coverage rate is below the provincial coverage rate.
- Haemophilus influenzae* type b (Hib) vaccine is recommended at two, four, and six months, with a booster dose at 18 months. If the primary series is delayed or interrupted, the schedule can be adjusted to bring the child up-to-date for protection. Data for three, five, eight, 12, 20, 24 and 59 months are shown with 12, 20, 24 and 59 months reported as up-to-date.
- Up-to-date at 12 months:
 - children who received three doses at two, four, and six months AND
 - children who received three doses with at least 28 days between each dose AND
 - children who received two doses four weeks apart between ages seven and 11 months AND
 - children who received their first dose at 12 months of age.
- Up-to-date at 20 months:
 - children who received four doses at two, four, six, and 18 months AND
 - children who received three doses with at least 28 days between each dose and a fourth dose at least 56 days after the third dose AND
 - children who received two doses four weeks apart between ages seven and 11 months and a third dose at least 56 days after the second dose AND
 - children who received one dose at 12-14 months and a second dose at least 56 days after the first AND
 - children who received one dose between 15-20 months.
- Up-to-date at 24 months:
 - a) to d) for 20 months AND
 - children who received one dose between 15-24 months.
- Up-to-date at 59 months:
 - a) to d) for 20 months AND
 - children who received one dose between 15-59 months.
- At the provincial level, coverage at all ages remained stable or improved from 2017 to 2018.
- In 2018 the up-to-date coverage rate was higher among the 59-month age group compared to the 20-month age group: 91% vs. 71.1%.
- In 2018 three former RHAs were below the provincial coverage rate in all but one age-dose/up-to-date category and one former RHA was below in five categories.
- In 2018 four former RHAs were at or above the provincial rate in all seven age-dose/up-to-date categories and three former RHAs were at or above in five categories.
- 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 *Haemophilus influenzae* type b

Notification Timeline:

From Lab/Practitioner to Public Health: Within 48 hours.

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 evidence¹ of invasive disease with laboratory confirmation of infection:

- isolation of *H. influenzae* (serotype b) (Hib) from a normally sterile site[^]
- OR
- isolation of *H. influenzae* (serotype b) from the epiglottis in a person with epiglottitis.

Probable Case

Clinical evidence of invasive disease with laboratory evidence of infection:

- demonstration of *H. influenzae* type b antigen in cerebrospinal fluid
- OR
- demonstration of *H. influenzae* DNA in a normally sterile site
- OR
- buccal cellulitis or epiglottitis in a child < 5 years of age with no other causative organisms isolated.



Photo Courtesy of Children's Immunization Project, St. Paul, Minnesota

¹Clinical illness associated with invasive disease due to *H. influenzae* includes meningitis, bacteraemia, epiglottitis, pneumonia, pericarditis, septic arthritis and empyema.

[^]Includes: blood, cerebrospinal, joint, pleural, pericardial, or peritoneal fluid.

DATA NOTES

Case Data Source: Panorama and the Integrated Public Health Information System (iPHIS) are information systems that support public health surveillance. Confirmed cases must meet the provincial surveillance case definition. Panorama replaced iPHIS on October 1, 2018.

There are 10 peer groups used by Statistic Canada, each identified by a letter (A to J). A peer group consists of former health regions with similar socio-economic characteristics which facilitates comparisons within a peer group. The twelve former health regions and one health authority in Saskatchewan fall into four groups identified by letters A, D, F and H. The peer groups in this report are based on Statistics Canada 2011 peer groupings and should not be compared to current Statistics Canada peer groupings (2014).

Vaccine Coverage Data Source: Panorama is a comprehensive, integrated public health information system. Of the five modules in the system, four have been implemented: vaccine inventory, immunization, investigations and outbreaks management. When fully functional, it will help public health professionals to work together to effectively manage vaccine inventories, immunizations, investigations, outbreaks and family health. To learn more, please visit: www.ehealthsask.ca/services/panorama/Pages/default.aspx.

Many FNIHB and NITHA communities are not currently using Panorama. Therefore, immunization data for many First Nations children are missing or are incomplete. This report includes only those children with Saskatchewan health coverage and registered in Panorama under a former health region or AHA as of as of August 1, 2019. In other words, children with Saskatchewan health coverage and registered in Panorama under FNIHB-SK or NITHA jurisdiction are excluded. This means this report does not include coverage statistics for the entire provincial or regional population.

The three-dose primary series and one-dose booster Hib-containing vaccine is administered as diphtheria, tetanus, acellular pertussis, inactivated polio & *Haemophilus influenzae* type b (DTaP-IPV-Hib). Immunization coverage is based on those who turned three, five, eight, 12, 20, 24 and 59 months by December 31 in 2017 and 2018. For example, the immunization coverage for 24-month-old children in 2018 is based on clients who were born in 2016 and the immunization doses they received by their second birthdays.