

Vaccine Preventable Disease Monitoring Report

Haemophilus influenzae type b, 2014

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<p>Purpose:</p> <p>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.</p> <p>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.</p>	<h3>Background</h3> <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 5 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>Under <i>The Public Health Act, 1994</i> and the accompanying Disease Control Regulations, local medical health officers (MHOs) must report Category I Communicable Diseases, as well as any communicable disease outbreaks to the provincial Chief and Deputy Chief Medical Health Officers. <i>Haemophilus influenzae</i> type b is a Category I disease.</p> <p>Report Features:</p> <p>Background Epidemiological Summary Surveillance Case Definition Case Counts by Year Case Characteristics Vaccine Coverage by RHA</p>	<h3>Immunization</h3> <p>The Saskatchewan Routine Childhood Immunization Schedule recommends a three dose primary series of Hib-containing vaccine at 2, 4 and 6 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 (5th birthday), Hib-containing vaccine is recommended for children of this age-group with congenital immunodeficiency, malignant hematologic disorders, HIV, anatomic or functional asplenia, and all transplant and cochlear implant recipients.</p>
<p>Prepared by:</p> <p>Population Health Branch, Saskatchewan Ministry of Health.</p> <p>Contact:</p> <p>Val Mann, PhD Chief Population Health Epidemiologist, Population Health Branch, Saskatchewan Ministry of Health email: cdc@health.gov.sk.ca</p>	<h3>Surveillance</h3> <p>Under <i>The Public Health Act, 1994</i>, Saskatchewan health care providers are required to report cases of Hib 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>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 SUMMARIES

Haemophilus influenzae type b (Hib) in Saskatchewan: 2014

- One (1) case of lab-confirmed Hib in an adult was reported in 2014.
- It is unknown if this case was hospitalized.

Haemophilus influenzae type b (Hib) in Saskatchewan: 2011 to 2014

- Three cases of Hib ranging in age from eight months to over 60 years were reported.
- One of the two pediatric cases had one dose of Hib vaccine prior to his illness. The other pediatric case was not immunized.
- Both pediatric cases were hospitalized.
- None of the cases are known to have died.

Table 1: Hib case counts by year

	2015*	2014	2013	2012	2011	Total
Saskatchewan	0	1	1	0	1	3
Canada	N/A	N/A	33	23	32	88

*preliminary counts to date, January 2016

N/A = not available

Table 2: Hib case characteristics, 2011-2014

Characteristics of Hib cases – Saskatchewan 2011 - 2014		Cases	Percent of Cases
Total		3	100
Sex	Male	3	100
	Female	0	0
Age	Less than 1 yr	1	33
	1 - 4 yrs	1	33
	5 - 19 yrs	0	0
	20 - 49	0	0
	50 yrs and over	1	33
Hospitalized	Yes	2	67
	No	1	33
	Unknown	0	0
Immunization status for Hib vaccine	2 doses	0	0
	1 dose	1	33
	0 dose	1	33
	Too young	0	0
	Unknown	1	33
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
Genotype	Unknown	0	0

Table 3: Hib vaccine coverage for Saskatchewan by year

Age	Doses	2014	2013	2012
3 months	1	84.1%	83.4%	83.0%
5 months	2	73.7%	73.8%	72.2%
8 months	3	76.2%	75.6%	74.4%
12 months	Up-to-date	85.0%	84.7%	84.8%
20 months	Up-to-date	61.1%	60.2%	60.6%
24 months	Up-to-date	76.5%	77.3%	76.3%
59 months	Up-to-date	86.4%	85.6%	84.6%

VACCINE COVERAGE SUMMARIES

Table 4: Hib Vaccine Coverage by Health Region, 2014

Health Region, by Peer Group	Vaccine coverage (% immunized), by age and dose or up-to-date						
	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	84.1	73.7	76.2	85.0	61.1	76.5	86.4
Peer Group A							
Regina Qu'Appelle	86.3	74.7	77.8	85.2	63.8	76.0	85.6
Saskatoon	84.7	76.4	77.2	85.6	64.0	79.2	86.6
Peer Group D							
Cypress	88.6	75.9	79.5	89.2	67.6	81.2	90.2
Five Hills	87.4	78.9	81.6	89.1	62.7	79.6	88.8
Heartland	86.4	75.2	83.1	89.6	64.9	83.3	90.3
Kelsey Trail	84.8	69.8	74.4	85.0	50.7	74.0	86.8
Sun Country	90.7	88.2	90.0	91.9	68.8	83.1	91.3
Sunrise	82.4	72.7	78.2	86.9	61.3	74.6	88.4
Peer Group F							
Athabasca Health Authority	82.8	59.4	81.6	95.7	75.0	87.0	95.5
Keewatin Yatthé	70.2	51.4	51.1	74.7	42.1	67.9	95.2
Mamawetan Churchill River	71.0	55.1	59.6	81.5	45.7	71.6	87.2
Peer Group H							
Prince Albert Parkland	73.1	59.2	62.9	75.2	46.0	66.1	81.2
Prairie North	79.2	66.6	69.0	79.5	53.1	68.0	80.5

Table 5: Hib Vaccine Coverage by Health Region, 2013

Health Region, by Peer Group	Vaccine coverage (% immunized), by age and dose or up-to-date						
	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	83.4	73.8	75.6	84.7	60.2	77.3	85.6
Peer Group A							
Regina Qu'Appelle	84.6	76.1	78.0	85.5	64.8	77.2	84.8
Saskatoon	84.0	76.2	77.2	85.0	60.8	80.6	85.4
Peer Group D							
Cypress	81.6	70.5	74.1	86.7	58.9	78.1	91.5
Five Hills	86.7	78.2	81.8	88.8	59.5	79.8	88.7
Heartland	84.7	75.9	80.9	91.5	67.7	81.2	90.1
Kelsey Trail	83.6	74.0	77.9	88.2	56.6	73.2	86.0
Sun Country	89.7	83.9	86.1	91.3	76.2	85.9	92.0
Sunrise	82.8	74.0	78.6	84.9	54.4	73.8	88.0
Peer Group F							
Athabasca Health Authority	84.0	74.2	77.8	93.3	72.7	92.5	88.9
Keewatin Yatthé	72.5	59.8	59.6	83.4	55.8	82.4	87.0
Mamawetan Churchill River	78.2	53.7	53.9	82.0	45.4	70.4	84.7
Peer Group H							
Prince Albert Parkland	77.5	58.6	57.8	73.3	46.1	65.7	81.2
Prairie North	79.1	66.4	68.3	79.0	48.0	67.5	80.6

Table 6: Hib Vaccine Coverage by Health Region, 2012

Health Region, by Peer Group	Vaccine coverage (% immunized), by age and dose or up-to-date						
	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	83.0	72.2	74.4	84.8	60.6	76.3	84.6
Peer Group A							
Regina Qu'Appelle	84.3	74.6	76.3	84.4	67.4	78.1	82.8
Saskatoon	83.5	73.1	75.3	86.3	59.9	76.8	86.3
Peer Group D							
Cypress	83.9	71.0	75.3	88.0	57.9	78.3	87.7
Five Hills	83.1	75.0	77.4	89.2	59.7	77.5	88.8
Heartland	84.2	76.2	81.3	90.4	65.9	80.6	88.5
Kelsey Trail	86.3	74.6	77.2	86.8	58.6	75.7	84.4
Sun Country	91.0	87.1	87.4	91.6	72.7	87.9	91.7
Sunrise	80.1	69.8	75.3	84.6	58.2	77.5	87.1
Peer Group F							
Athabasca Health Authority	90.3	65.6	63.9	97.4	72.7	81.5	83.3
Keewatin Yatthé	72.7	47.9	46.7	77.4	54.0	79.2	89.9
Mamawetan Churchill River	68.6	47.8	54.7	72.4	46.4	65.5	70.5
Peer Group H							
Prince Albert Parkland	77.1	57.2	60.0	75.7	45.9	66.0	78.9
Prairie North	79.3	68.1	68.8	78.6	51.7	68.1	78.8

Three years of coverage data in seven age-dose/up-to-date categories are provided by RHA. A yellow highlighted cell means the RHA's coverage rate is below the provincial coverage rate.

Hib vaccine is recommended at 2, 4, and 6 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:

- a) children who received three doses at 2, 4, and 6 months AND
- b) children who received three doses with at least 28 days between each dose AND
- c) children who received 2 doses 4 weeks apart between ages 7 and 11 months AND
- d) children who received their first dose at 12 months of age.

Up-to-date at 20 months:

- a) children who received four doses at 2, 4, 6, and 18 months AND
- b) 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
- c) children who received 2 doses 4 weeks apart between ages 7 and 11 months and a third dose at least 56 days after the second dose AND
- d) children who received one dose at 12-14 months and a second dose at least 56 days after the first AND
- e) children who received one dose between 15-20 months.

Up-to-date at 24 months:

- a) to d) for 20 months AND
- e) children who received one dose between 15-24 months.

Up-to-date at 59 months:

- a) to d) for 20 months AND
- e) children who received one dose between 15-59 months.

At a provincial level, coverage at all ages improved from 2012 to 2014. The largest improvement was seen at eight months with an increase of 2.4% from 2012 to 2014

Provincially in 2014, there was substantial growth in coverage from 20 to 59 months with an increase of 41%.

Overall, the poorest coverage rates are seen at 20 months. In 2012, only four regions reported a coverage rate equal to or above the provincial average but by 2014, eight regions reported rates at or above the provincial average for this age group.

Coverage rates for health regions in Peer Groups F and H should be interpreted with caution.

SURVEILLANCE CASE DEFINITION: Saskatchewan

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 hrs.

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

Confirmed Case	<p>Clinical evidence¹ of invasive disease with laboratory confirmation of infection:</p> <ul style="list-style-type: none"> isolation of <i>H. influenzae</i> (serotype b) (Hib) from a normally sterile site[^] OR isolation of <i>H. influenzae</i> (serotype b) from the epiglottis in a person with epiglottitis.
Probable Case	<p>Clinical evidence of invasive disease with laboratory evidence of infection:</p> <ul style="list-style-type: none"> demonstration of <i>H. influenzae</i> type b antigen in cerebrospinal fluid OR demonstration of <i>H. influenzae</i> 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

¹ Clinical 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: Saskatchewan Integrated Public Health Information System (iPHIS), a provincially mandated integrated client-centred case management information system that supports public health surveillance. Confirmed cases must meet the provincial surveillance case definition.

Peer groups were created by Statistics Canada. A peer group consists of health regions with similar socio-economic characteristics so that important differences may be detected by comparing within a peer group. The thirteen health regions in Saskatchewan fall into four (identified by letters A, D, F and H) of the ten peer groups (A to J) across Canada.

Vaccine Coverage Data Source: 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 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 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.