

Vaccine Preventable Disease Monitoring Report

Mumps, 2017 and 2018

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PREPARED BY POPULATION HEALTH BRANCH, SASKATCHEWAN MINISTRY OF HEALTH

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<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. Mumps is a Category I disease.</p> <p><u>Report Features:</u></p> <p>Background Epidemiological Summary Surveillance Case Definition Case Counts by Year Case Characteristics Vaccine Coverage by AHA and former RHA</p> <p><u>Data Source:</u></p> <p>Panorama (as of April 1, 2019)</p>	<div> <div> <h2>Background</h2> <p>Mumps is an acute, viral communicable disease characterized by fever, swelling and tenderness of one or more salivary glands lasting more than two days. The parotid gland is usually affected hence the term parotitis (see image, page 6). Up to 30% of infected cases can be asymptomatic. Orchitis (inflammation of the testes) may occur in as many as 20-30% of post pubertal males. About one in 20 females develop swollen ovaries. Meningitis or encephalitis were common before the widespread use of vaccine, however the U.S. Centers for Disease Control and Prevention reported these in less than 1% of cases in recent U.S. outbreaks. Mumps has not been associated with congenital malformations, however, infection during the first trimester of pregnancy is associated with an increased rate of spontaneous abortion.</p> <p>The time from exposure to early symptoms such as fever (incubation period) ranges from 14 to 25 days.</p> <p>The mumps virus can be identified up to seven days before the onset of symptoms and for as long as 9-14 days after the onset of the illness. The period of maximum infectiousness is between two days before to four days after the onset of parotitis.</p> <p>Mumps virus is a member of the family <i>Paramyxoviridae</i>, genus <i>Rubulavirus</i>.</p> <p>Although mumps is not common in Canada, travelers outside of North America have a higher risk of exposure to mumps.</p> <p>Mumps outbreaks still occur, especially in crowded institutions such as educational facilities. Mumps outbreaks were associated with the National Hockey League (late 2014) and the Western Hockey League (2017-18).</p> </div> <div> <h2>Immunization</h2> <p>The Saskatchewan Routine Childhood Immunization Schedule recommends two doses of mumps containing vaccine for infants, children and adolescents. The doses are scheduled at 12 and 18 months of age. Mumps containing vaccine is also offered to school-age children (Grades 1, 6 and 8) who have not received two doses, and to susceptible adults born in 1970 or later.</p> <p>Immunization coverage that measures the proportion of individuals vaccinated with recommended doses is a reliable indicator of the preventative measures to control the spread of disease.</p> <p>The effectiveness of mumps containing vaccine has been estimated at 62% to 91% for one dose and 76% to 95% for two doses.</p> </div> <div> <h2>Surveillance</h2> <p>Under <i>The Public Health Act, 1994</i>, Saskatchewan health care providers are required to report cases of mumps to the local Medical Health Officer (MHO). The MHO then reports cases to the Chief and Deputy Chief Medical Health Officers using the case definition in the Saskatchewan Communicable Disease Control Manual.</p> <p>Notifiable diseases may be undetected, therefore underreported, due to a number of factors including lack of contact with the health care system or 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.</p> <p>Surveillance case definitions ensure uniform reporting and comparability of surveillance data. The definitions are not intended to be used for clinical or laboratory diagnosis or management of cases.</p> <p>The variability in the number of mumps cases from one year to the next and in different geographical regions is usually because of outbreaks of the disease in communities.</p> </div> </div>
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EPIDEMIOLOGY AND VACCINE COVERAGE SUMMARY

Mumps in Saskatchewan: 2018

- In 2018, there was one mumps case less than a year old who was ineligible to receive vaccine. One preschooler case was fully immunized. All the school age cases (6 cases) were fully immunized with two doses of mumps containing vaccine; three of these were between 14 to 17 years of age. Two young adults had received two doses of mumps containing vaccine while the other four cases aged 20-60 years were inadequately immunized.
- An insidious mumps outbreak in a northern community with an onset in October 2017 continued to April 2018 and was declared over in May 2018. Eleven of the 14 cases in 2018 were part of this ongoing outbreak.
- There were no new mumps outbreaks declared in 2018.

Mumps in Saskatchewan: 2014 to 2018

- Ninety-three cases of mumps were reported in Saskatchewan between 2015 and 2018. No cases were reported in 2014. In the decade prior to 2014 between zero and three cases had been reported per year.
- In 2017, 66 of 77 cases were related to three outbreaks with sources outside the province. The outbreaks comprised mainly of adults (41 cases). Of the 21 adults who had received two doses of mumps containing vaccine, two-thirds (14 cases) were under 30 years. Twenty-two of the 25 eligible cases under 20 years were fully immunized.
- The median age of the cases between 2015 and 2018 was 22 years.
- Two cases were reported hospitalized for mumps illnesses.
- Eight cases had one primary dose of mumps-containing vaccine. Fifty-two cases (56%) had received two doses. Thirty cases were unimmunized. Three cases were too young to receive the MMR vaccine.
- Twenty-one cases were exposed to an unidentified source. Three were in contact with a case who had been exposed to an unknown source. Three others acquired their infection in Alberta or Manitoba.

Mumps Coverage in Saskatchewan: 2014 to 2018

- From 2014 to 2018, provincial coverage rates improved in all age groups except five, seven and 13 years.
- The rates declined for those age-dose categories during the same time period.

Table 1: Mumps case counts by year

	2018	2017	2016	2015	2014	Total
Saskatchewan	14	77	1	1	0	93
Canada	N/A	N/A	364	59	40	463

N/A = not available

Table 2: Mumps case characteristics, Saskatchewan 2014-2018

		Cases	Percent of Cases
Total		93	100
Sex	Male	56	60
	Female	37	40
Age	Less than 1 year	3	3
	1 - 4 years	4	4
	5 - 19 years	32	34
	20 - 49 years	47	51
	50 years and over	7	8
Hospitalized	Yes	2	2
	No	91	98
	Unknown	0	0
Immunization status for mumps vaccine	2 doses	52	56
	1 dose	8	9
	0 dose	30	32
	Too young	3	3
	Unknown	0	0
Source	International	0	0
	Canada	93	100
	Alberta	2	
	Manitoba	1	
	Saskatchewan	90	
Provincial source (n=90)	Domestic Travel	0	0
	Epidemiologically-linked/contact to travel case	0	0
	Epidemiologically-linked/contact to case with unknown source	3	3
	Local outbreak	66	73
	No identified source	21	23
Genotype*	Unknown	93	100

*Laboratory analyses can identify different genotypes of mumps, which may help identify whether the virus was imported or possibly related to other cases.

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

Age	Doses	2018	2017	2016 ^a	2015 ^a	2014 ^b
13 months	1	64.2%	60.8%	58.5%	59.5%	59%
18 months	1	86.3%	85.5%	84.4%	82.8%	84.2%
19 months	2	54.9%	49.2%	46.5%	46.4%	45.6%
24 months	1	90.5%	88.9%	88.6%	87.9%	88.4%
	2	80.5%	76.3%	76.3%	73.3%	75.6%
5 years	1	93.1%	91.4%	93.3%	91.1%	93.3%
	2	87.3%	84.5%	87.8%	84.6%	87.9%
7 years	2	90.1%	89.3%	90.1%	88.4%	90.7%
13 years	2	93.5%	93.5%	93.1%	92.6%	94.5%
15 years	2	95%	94.6%	94.8%	94%	91.8%
17 years	2	94.6%	93.6%	90.7%	89.3%	89.5%

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

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

EPIDEMIOLOGY AND VACCINE COVERAGE SUMMARY

Table 4: Mumps 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										
	13 months	18 months	19 months	24 months		5 years		7 years	13 years	15 years	17 years
	1 dose	1 dose	2 doses	1 dose	2 doses	1 dose	2 doses	2 doses	2 doses	2 doses	2 doses
Saskatchewan	64.2	86.3	54.9	90.5	80.5	93.1	87.3	90.1	93.5	95	94.6
Saskatchewan Health Authority	64.2	86.3	54.9	90.5	80.5	93.1	87.2	90.1	93.5	95	94.6
Peer Group A											
Regina Qu'Appelle	67.9	86.5	60.6	89	78.4	92.9	86.3	90.8	94.6	95.6	94.5
Saskatoon	58.4	86.4	48.2	91.2	81.4	91.2	84.8	87.9	92.1	94.8	94.6
Peer Group D											
Cypress	70.9	89.6	63.3	92.4	84.8	95.7	91.9	93	94.9	96.3	95.6
Five Hills	73.2	87	65.6	92.2	83.3	95.1	89.4	89.9	93.1	95.8	95.9
Heartland	68.6	89.4	66.5	93	88.7	94.3	92.9	94.5	95.5	95.9	96
Kelsey Trail	79.1	94	69.1	95.6	91.7	97.3	95.7	94.5	95.9	97.9	96.2
Sun Country	85	94.2	76.7	94.9	92.3	96.7	94.7	94.8	95.9	96.8	98.3
Sunrise	67.8	83.7	54.4	90.4	81	93.2	88.8	91.9	94.9	95.3	95.8
Peer Group F											
Athabasca Health Authority	71.4	88.5	41.4	94.4	80.6	100	94.3	100	96.7	91.7	91.3
Keewatin Yatthe	49	78.3	28.5	89.2	65.6	93.8	88.1	89.7	86	95	94.6
Mamawetan Churchill River	65.5	91.6	50.3	96.9	84	100	98	95.4	89.8	92.6	93.3
Peer Group H											
Prairie North	61.2	81.2	47.4	86.8	74.3	93.6	87.1	87.3	90.7	90.5	90.6
Prince Albert Parkland	50.4	78.9	40.8	87.3	70.4	94.6	86.4	88.9	95.1	94.6	92.8

Table 5: Mumps 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										
	13 months	18 months	19 months	24 months		5 years		7 years	13 years	15 years	17 years
	1 dose	1 dose	2 doses	1 dose	2 doses	1 dose	2 doses	2 doses	2 doses	2 doses	2 doses
Saskatchewan	60.8	85.5	49.2	88.9	76.3	91.4	84.5	89.3	93.5	94.6	93.6
Saskatchewan Health Authority	60.9	85.5	49.2	88.9	76.3	91.4	84.5	89.3	93.5	94.6	93.6
Peer Group A											
Regina Qu'Appelle	56.6	83.8	48.3	86.8	72.8	91	83.5	89	93.4	94.5	93.1
Saskatoon	60.5	85.5	45.5	89	77.4	89.9	81.7	87.4	92.9	94.4	93.3
Peer Group D											
Cypress	64.3	88.7	58.8	90.8	81.9	95.4	89.3	91.4	95.4	95.4	95.3
Five Hills	67	88.6	57.1	92	79.8	91.3	85.6	90.1	93.4	96.6	94.3
Heartland	68.3	91.8	59.9	92.8	84.5	94.7	91.1	94.9	95.4	95.8	96
Kelsey Trail	74.7	92.7	61	95.5	87.4	95.4	91.1	93.6	96.1	96.5	93.8
Sun Country	79.1	92.4	70.3	94.2	88.1	95.9	92.8	95.3	95.1	96.6	96.5
Sunrise	69.3	87.4	60.3	90.6	78.9	91.6	85.4	89.4	94.2	94.1	94.7
Peer Group F											
Athabasca Health Authority	52.8	88.4	36.6	97.3	73	96.7	93.3	89.6	90.2	82.6	92.5
Keewatin Yatthé	50.3	84.1	30.6	85.1	61.5	94.8	88.5	88.5	90.5	94.9	87.9
Mamawetan Churchill River	54.8	89.9	44.4	94.1	75.6	98.1	95.7	92.8	92.6	96.8	92.6
Peer Group H											
Prairie North	57.5	81.5	43.5	85.2	69.8	90.6	83.8	88.1	91.6	92.2	92.1
Prince Albert Parkland	51.7	80.4	37.9	88.2	68.1	92.4	86.1	88.6	93.9	93.3	93.8

- Two years of coverage data in 11 age-dose categories are provided by former RHA and Athabasca Health Authority (AHA). Yellow highlighted numbers indicate rates below the provincial coverage rate.
- At the provincial level, coverage from 2017 to 2018 either improved or remained stable for all age-dose categories.
- In 2018, for one-dose at five years of age, ten former RHAs and AHA exceeded the provincial average and only two former RHAs were below.
- In 2018, eight former RHAs and AHA exceeded the provincial average for the following age-dose categories: 13 months, 18 months, 24 months (2 doses) and five years (2 doses).
- In 2018, the one-dose coverage rate was higher among the 18-month age group compared to the 13-month age group: 86.3% vs. 64.2%. Likewise, the two-dose coverage rate for the 24-month age group was higher than the 19-month age group: 80.5% vs. 54.9%.
- In 2018, the former Prairie North RHA was below the provincial rate in all but one age-dose category and the former Prince Albert Parkland RHA was below the provincial rate in all but two age-dose categories.
- In 2018, four of the former RHAs: Cypress, Heartland, Kelsey Trail and Sun Country were at or above the provincial rate in all age-dose categories and the former Five Hills RHA was at or above the provincial average in all but two categories.
- Coverage rates for former 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 Mumps

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

Clinical illness¹ and laboratory confirmation of infection in the absence of recent immunization with mumps-containing vaccine:

- isolation of mumps virus from an appropriate clinical specimen
OR
- detection of mumps virus RNA
OR
- seroconversion or a significant rise (e.g., fourfold or greater) in mumps IgG titre by any standard serologic assay between acute and convalescent sera
OR
- positive serologic test for mumps IgM antibody in a person who is either epidemiologically linked to a laboratory-confirmed case or has recently travelled to an area of known mumps activity.

OR

Clinical illness¹ in a person with an epidemiologic link to a laboratory-confirmed case.

Probable Case

Clinical illness¹

- in the absence of appropriate laboratory tests
OR
- in the absence of an epidemiologic link to a laboratory-confirmed case.



Photo Courtesy of Centers for Disease Control/
Patricia Smith; Barbara Rice

¹ Clinical illness is characterized by acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting > 2 days, and without other apparent cause.

To confirm diagnosis of the mumps, the following must be taken into consideration:

- lab information;
- clinical presentation;
- case history.

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.

Mumps molecular epidemiology is a tool for tracking mumps virus importations, establishing whether connections exist between concurrent mumps cases or outbreaks, and demonstrating the absence of sustained mumps transmission. Genotyping is performed by the National Medical Laboratory (NML).

There are 10 peer groups used by Statistics 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 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.

Most FNIHB and NITHA communities, with the exception of those in the Athabasca Health Authority (AHA), are not currently using Panorama. Therefore, immunization data for most First Nations (FN) 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 jurisdiction as of April 1, 2019. In other words, children with Saskatchewan health coverage and registered in Panorama under FNIHB or NITHA jurisdiction are excluded (including those from FNIHB and NITHA communities in AHA). This means this report does not include coverage statistics for the entire provincial or regional populations.

Mumps vaccine is currently administered as measles-mumps-rubella-varicella (MMRV) or measles-mumps-rubella (MMR) vaccine. Immunization coverage is based on those who turned 13, 18, 19 and 24 months, and five, seven, 13, 15 and 17 years by December 31 in 2017 and 2018. For example, the immunization coverage for 7-year-old children in 2018 is based on clients who were born in 2011 and the immunization doses they received by their seventh birthdays.