

Vaccine Preventable Disease Monitoring Report Mumps, 2015 and 2016

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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. Mumps 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

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 4). 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 occurs in about 10% of cases. During the first trimester of pregnancy, mumps is associated with an increased rate of spontaneous abortion.

The time from exposure to early symptoms such as fever (incubation period) ranges from 14 to 25 days.

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.

Mumps virus is a member of the family *Paramyxoviridae*, genus *Rubulavirus*.

Although mumps is not common in Canada, travelers outside of North America have a higher risk of exposure to mumps.

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).

Immunization

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.

Vaccination is the best way to prevent mumps. A community immunity level of 75% to 86% is required to stop or interrupt mumps transmission.

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.

The effectiveness of mumps containing vaccine has been estimated at 62% to 91% for one dose and 76% to 95% for two doses.

Surveillance

Under *The Public Health Act, 1994*, 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.

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.

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.

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.

EPIDEMIOLOGY SUMMARY

Mumps in Saskatchewan: 2015

- One lab-confirmed case of mumps was reported. The child was too young to be immunized with mumps-containing vaccine.
- No cases were reported hospitalized.

Mumps in Saskatchewan: 2011 to 2015

- Three cases of mumps were reported, one in each of Regina Qu'Appelle and Prairie North health regions and Northern Inter-Tribal Health Authority.
- Dates of onset were in March and September.
- The median† age of cases was 22 years.
- No cases were reported hospitalized for mumps illnesses.
- One case had one primary dose of mumps-containing vaccine. The vaccination status of the second case is unknown. The infant case was too young to be immunized with mumps-containing vaccine.
- One case of mumps was acquired in the Philippines and the others in Saskatchewan.
- Genotyping was not available for these cases.
- One case is known to have wild virus type disease and was not a contact of an immunized person. Another case was a household contact of a person with non-confirmed symptoms of mumps.

†The median age divides a population into two equal groups; that is, half the people are younger than this age and half are older.

Mumps Coverage in Saskatchewan: 2012 to 2016

- From 2012 to 2016, all age groups except seven-year-old children showed a slight improvement in coverage rates. The coverage rate for seven-year-old children declined slightly during the same time period.

Table 1: Mumps case counts by year

	2016*	2015	2014	2013	2012	2011	Total
Saskatchewan	1	1	0	2	0	0	4
Canada	N/A	N/A	40	94	48	273	455

*preliminary counts

N/A = not available

Note: 2017 – 16 cases as of March 31st (preliminary counts)

Table 2: Mumps case characteristics, 2011-2015

Characteristics of mumps cases – Saskatchewan 2011 - 2015		Cases	Percent of Cases
Total		3	100
Sex	Male	1	33
	Female	2	67
	Unknown	0	0
Age	Less than 1 year	1	33
	1 - 4 years	0	0
	5 - 19 years	0	0
	20 - 49 years	2	67
	50 years and over	0	0
Hospitalized	Yes	1	33
	No	2	67
	Unknown	0	0
Immunization status for mumps vaccine	2 doses	0	0
	1 dose	1	33
	0 dose	1	33
	Too young	0	0
	Unknown	1	33
Source	International	1	33
	Philippines	1	
	Canada	2	67
	Saskatchewan	2	
Provincial source (n=2)	Domestic Travel	0	0
	Epidemiologically-linked to travel case	0	0
	Epidemiologically-linked to case with unknown source	0	0
	No identified source	2	100
Genotype**	Unknown	3	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 for Saskatchewan, 2012-2016

Age	Doses	2016	2015	2014	2013	2012
13 months	1	58.5%	59.5%	59.0%	55.0%	54.9%
18 months	1	84.4%	82.8%	84.2%	83.0%	83.6%
19 months	2	46.5%	46.4%	45.6%	43.6%	44.3%
24 months	1	88.6%	87.9%	88.4%	89.0%	88.2%
	2	76.3%	73.3%	75.6%	75.7%	74.6%
5 years	1	93.3%	91.1%	93.3%	92.7%	92.7%
	2	87.8%	84.6%	87.9%	87.0%	86.2%
7 years	2	90.1%	88.4%	90.7%	91.2%	91.1%
13 years	2	93.1%	92.6%	94.5%	94.6%	52.3%
15 years	2	94.8%	94.0%	91.8%	89.8%	88.2%
17 years	2	90.7%	89.3%	89.5%	88.7%	78.8%^

^Immunization records may be incomplete for children born prior to 1996. Therefore, the 2012 coverage rate for 17-year-old adolescents may not reflect actual provincial or RHA rates.

EPIDEMIOLOGY SUMMARY

Table 4: Mumps Vaccine Coverage by Health Region, 2016

Health Region, by Peer Group	Vaccine 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	58.5	84.4	46.5	88.6	76.3	93.3	87.8	90.1	93.1	94.8	90.7
Peer Group A											
Regina Qu'Appelle	52.8	81.9	43.9	87.0	75.1	93.4	87.1	90.2	93.4	95.6	91.2
Saskatoon	60.2	86.9	48.1	90.7	79.9	93.2	88.0	89.7	92.8	95.1	91.3
Peer Group D											
Cypress	64.0	87.4	56.4	93.7	88.0	94.6	92.3	92.6	95.0	95.2	91.5
Five Hills	69.5	88.5	48.7	88.2	75.7	93.1	86.3	91.3	94.1	95.3	94.1
Heartland	64.0	89.6	53.3	92.1	80.8	96.9	92.2	93.4	93.9	94.4	94.1
Kelsey Trail	69.9	86.9	53.3	90.2	77.2	92.4	87.5	91.6	95.5	95.8	92.1
Sun Country	75.1	92.3	65.5	93.7	88.7	96.8	94.1	94.0	96.8	97.9	94.9
Sunrise	65.4	82.1	49.0	86.8	73.1	94.5	88.7	90.6	94.6	96.1	92.6
Peer Group F											
Athabasca Health Authority	61.1	94.4	31.6	91.4	82.9	96.9	96.9	97.8	87.2	90.0	82.4
Keewatin Yatthé	41.9	75.2	17.3	83.9	56.5	92.6	87.3	88.6	96.6	94.7	76.3
Mamawetan Churchill River	45.7	78.4	28.3	86.2	64.1	94.0	87.5	89.5	87.0	91.7	73.6
Peer Group H											
Prairie North	50.5	77.5	38.6	85.5	68.7	89.0	82.4	87.3	89.5	91.3	87.6
Prince Albert Parkland	49.6	77.3	35.6	81.1	60.8	92.2	86.0	86.7	90.5	90.9	88.0

Table 5: Mumps Vaccine Coverage by Health Region, 2015

Health Region, by Peer Group	Vaccine 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	59.5	82.8	46.4	87.9	73.3	91.1	84.6	88.4	92.6	94.0	89.3
Peer Group A											
Regina Qu'Appelle	61.5	82.6	51.7	87.1	73.1	90.0	82.6	88.0	92.7	94.3	90.5
Saskatoon	60.1	83.7	46.8	88.8	75.6	90.2	82.7	88.0	92.0	94.0	90.4
Peer Group D											
Cypress	69.3	88.6	56.4	91.3	78.2	94.9	90.3	92.1	94.8	95.2	92.6
Five Hills	60.8	82.1	42.6	88.5	69.9	92.0	85.6	92.2	95.0	93.7	90.4
Heartland	61.7	86.8	45.6	91.9	79.4	95.7	91.8	93.8	93.7	95.4	89.5
Kelsey Trail	54.5	84.3	39.5	87.4	72.3	95.1	90.8	89.6	95.9	94.1	88.7
Sun Country	71.5	91.1	59.9	93.5	84.3	97.2	94.4	91.1	96.4	96.3	93.3
Sunrise	58.1	83.9	44.6	87.3	73.7	91.1	86.0	87.8	93.0	95.3	91.8
Peer Group F											
Athabasca Health Authority	79.4	85.3	58.1	94.1	82.4	93.6	91.5	94.7	81.6	92.5	93.9
Keewatin Yatthé	45.0	74.7	23.0	86.1	60.0	88.3	86.2	88.3	95.0	88.4	77.2
Mamawetan Churchill River	45.5	80.1	31.3	87.0	67.8	92.8	86.0	89.3	94.0	91.0	74.3
Peer Group H											
Prairie North	53.9	78.3	37.2	85.6	68.2	89.0	81.1	85.6	89.0	91.9	83.8
Prince Albert Parkland	45.1	72.3	31.1	81.3	60.8	91.0	85.0	85.6	90.1	92.9	85.4

- Two years of coverage data in 11 age-dose categories are provided by RHA. Yellow highlight indicates RHAs below the provincial coverage rate.
- At the provincial level, coverage from 2015 to 2016 declined at 13 months from 59.5% to 58.5%.
- Other rates showed modest improvements for ages up to and including 17 years.
- At 13 months, 7 years, 13 years and 17 years of age for 2016, eight RHAs exceeded the provincial average and five were below.
- For 2016, the one-dose coverage rate was higher among the 18-month age group compared to the 13-month age group: 84.4% vs. 58.5%. Likewise, the two-dose coverage rate for the 24-month age group was higher than the 19-month age group: 76.3% vs. 46.5%.
- Two RHAs in 2016 were below the provincial rate in all eleven age-dose categories and two were below in ten categories.
- Two RHAs in 2016 were at or above the provincial rate in all age-dose categories and one was at or above the provincial average in all but one category.
- 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 Mumps



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

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.

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: 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.

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 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) 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.

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. Panorama's immunization module replaced the former Saskatchewan Immunization Management System (SIMS), on January 27, 2015. SIMS had been used province-wide since 2001. 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 health region jurisdiction as of January 12, 2017. 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 2015 and 2016. For example, the immunization coverage for seven-year-old children in 2016 is based on clients who were born in 2009 and the immunization doses they received by their seventh birthdays.