

Vaccine Preventable Disease Monitoring Report

Mumps, 2017

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Purpose:

The Saskatchewan Ministry of Health's Population Health Branch provides routine surveillance of notifiable diseases at the provincial and former 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:

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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 AND VACCINE COVERAGE SUMMARY

Mumps in Saskatchewan: 2017

- Three lab-confirmed outbreaks of mumps were reported in 2017. One involved a mine worksite. Another outbreak involved a sports team which likely contracted the virus during interprovincial sports events. Mumps was introduced into a remote community from a neighbouring province where mumps activity was high resulting in an insidious outbreak.
- Twenty-six cases were aged 5-19 years. Forty-four additional cases were in the 20-49 year age group, which if they were immunized, would have received only one dose of MMR rather than the currently recommended two doses.

Mumps in Saskatchewan: 2013 to 2017

- Eighty-one cases of mumps were reported in Saskatchewan between 2013 and 2017. Prior to 2017 only four cases had been reported. No cases were reported in 2014. In 2017, 77 cases were reported, largely related to outbreaks.
- The median† age of the cases was 24 years.
- Three cases were reported hospitalized for mumps illnesses.
- Four cases had one primary dose of mumps-containing vaccine. Thirty-nine (48%) had two doses. Twelve cases were unimmunized. Two cases were too young to receive the MMR vaccine.
- One case of mumps was acquired in the Philippines, two in Alberta, one in Manitoba and the others in Saskatchewan. Genotyping was not available for these cases.
- Twelve cases were a household contact of a person with lab-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: 2013 to 2017

- From 2013 to 2017, all age groups except seven- and thirteen-year-old children either showed a slight improvement or remained stable in coverage rates. The coverage rates for seven- and thirteen-year-old children declined slightly during the same time period.

Table 1: Mumps case counts by year

	2017	2016	2015	2014	2013	Total
Saskatchewan	77	1	1	0	2	81
Canada	N/A	364	59	40	96	559

N/A = not available

Table 2: Mumps case characteristics, 2013-2017

Characteristics of mumps cases – Saskatchewan 2013 - 2017		Cases	Percent of Cases
Total		81	100
Sex	Male	48	59
	Female	33	41
	Unknown	0	0
Age	Less than 1 year	2	2
	1 - 4 years	3	4
	5 - 19 years	26	32
	20 - 49 years	44	54
	50 years and over	6	7
Hospitalized	Yes	3	4
	No	78	96
	Unknown	0	0
Immunization status for mumps vaccine	2 doses	39	48
	1 dose	4	5
	0 dose	12	15
	Too young	2	2
	Unknown	24	30
Source	International	1	1
	Philippines	1	1
	Canada	80	99
	Alberta Manitoba Saskatchewan	2 1 77	
Provincial source (n=2)	Domestic Travel	0	0
	Epidemiologically-linked to travel case	0	0
	Epidemiologically-linked to case with unknown source	12	16
	Local outbreak	30	39
	No identified source	35	45
Genotype*	Unknown	81	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, 2013-2017

Age	Doses	2017	2016	2015	2014	2013
13 months	1	60.8%	58.5%	59.5%	59.0%	55.0%
18 months	1	85.7%	84.4%	82.8%	84.2%	83.0%
19 months	2	49.9%	46.5%	46.4%	45.6%	43.6%
24 months	1	89.5%	88.6%	87.9%	88.4%	89.0%
	2	77.8%	76.3%	73.3%	75.6%	75.7%
5 years	1	92.7%	93.3%	91.1%	93.3%	92.7%
	2	87.3%	87.8%	84.6%	87.9%	87.0%
7 years	2	90%	90.1%	88.4%	90.7%	91.2%
13 years	2	93.6%	93.1%	92.6%	94.5%	94.6%
15 years	2	94.8%	94.8%	94.0%	91.8%	89.8%
17 years	2	94.1%	90.7%	89.3%	89.5%	88.7%

VACCINE COVERAGE SUMMARY

Table 4: Mumps Vaccine Coverage by Health Region, 2017

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 does	1 dose	2 doses	1 dose	2 doses	1 dose	2 doses	2 doses	2 doses	2 doses	2 doses
Saskatchewan	60.8	85.7	49.9	89.5	77.8	92.7	87.3	90	93.6	94.8	94.1
Peer Group A											
Regina Qu'Appelle	57.2	84	49.1	87.3	74	91.7	86	89.9	93.9	95.2	94.2
Saskatoon	60.7	86.3	46.5	90.2	79.9	92.7	86.5	88.5	92.9	94.9	94.1
Peer Group D											
Cypress	64.3	89.3	59.6	91.6	82.6	96.3	90.9	93.3	95.2	95.6	95.4
Five Hills	67.2	88.9	57.9	92.2	81.8	92.7	87.7	90.9	94.6	97	94.7
Heartland	68.2	91.8	59.8	92.3	85.8	95.7	92.1	94.9	96	95.4	96.2
Kelsey Trail	77.1	93.5	61.5	96.5	88.4	95.5	92.7	94.9	96.3	97	94.5
Sun Country	80.4	93.6	73.4	96	91.5	96.1	94.7	96.3	96.3	97.4	97.1
Sunrise	68.1	86.9	61	90.9	81.5	92.3	87.5	89.3	94	94.1	95.3
Peer Group F											
Athabasca Health Authority	50	84.1	33.3	97.3	70.3	96.8	93.5	91.5	90.7	83.7	92.5
Keewatin Yatthé	49.7	81.1	31	83.8	61.9	95.2	88.2	88	90.1	94.3	88.4
Mamawetan Churchill River	56.3	90.5	45.4	95.6	76.3	97.7	95.4	89.1	90.4	94.7	91.1
Peer Group H											
Prairie North	56.2	81.1	43.9	85.3	69.8	90.5	83.4	87.5	92.3	91.9	92.2
Prince Albert Parkland	48.4	77.5	36.7	85.5	66.4	90.8	86.2	88.5	91.6	92.2	92.7

- One year of coverage data in 11 age-dose categories are provided by former RHA. Yellow highlight indicates former RHAs below the provincial coverage rate.
- At 24 months (one dose) and five years (one and two doses), nine of the former RHAs exceeded the provincial average and four were below.
- The one-dose coverage rate was higher among the 18-month age group compared to the 13-month age group: 85.7% vs. 60.8%. Likewise, the two-dose coverage rate for the 24-month age group was higher than the 19-month age group: 77.8% vs. 49.9%.
- In 2017 two former RHAs: Prairie North and Prince Albert Parkland were below the provincial rate in all eleven age-dose categories.
- In 2017 five of the former RHAs: Cypress, Five Hills, Heartland, Kelsey Trail and Sun Country were at or above the provincial rate in all age-dose categories and Sunrise was at or above the provincial average in all but three 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: 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 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: 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 the former 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 former health region jurisdiction as of January 1, 2018. 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, 2017. For example, the immunization coverage for 7-year-old children in 2017 is based on clients who were born in 2010 and the immunization doses they received by their seventh birthdays.