

Vaccine Preventable Disease Monitoring Report Rotavirus, 2017 and 2018

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PREPARED BY POPULATION HEALTH BRANCH, SASKATCHEWAN MINISTRY OF HEALTH

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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 authorities (RHAs), Athabasca Health Authority (AHA), First Nations and Inuit Health Branch - Saskatchewan (FNIHB-SK) 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 Panorama. Limitations associated with these systems have been described elsewhere.

Report Features:

Background
Epidemiological Summary
Vaccine Coverage by AHA and former RHA

Data Source:

Panorama (as of June 1, 2019)

BACKGROUND

Rotavirus infections cause acute gastroenteritis (inflammation of the stomach and intestines). Acute gastroenteritis is the primary cause of diarrhea and related dehydration in infants and young children. Rotavirus transmission can occur through direct contact with the stool of infected persons and through fomites (objects or surfaces contaminated with the virus) as the virus is highly stable in the environment.

Individuals infected by rotavirus usually become symptomatic within one to three days of viral exposure and can experience fever and abdominal pain including vomiting and watery diarrhea for three to eight days. When signs of dehydration appear the infection is considered serious and can result in death.

Globally, almost every child is infected by a strain of rotavirus before the age of five years. Given the ubiquity of rotavirus infections among child populations, rotavirus is associated with high health-care utilization. According to the Canadian Immunization Guide, an estimated 36% of Canadian children with rotaviral gastroenteritis visit physicians, 15% visit emergency departments, and 7% require hospitalization; 63% of these hospitalizations occur in children less than 2 years of age. Mortality rates associated with rotavirus infection are very low in high income countries such as Canada, however, the risk of death is higher in infants in lower income countries.

IMMUNIZATION

Rotavirus vaccine is administered orally. It is recommended that the first dose of rotavirus vaccine be administered to healthy infants between six and 14 weeks of age. This vaccine is not recommended for infants with a history of intussusception and should not be given to immunocompromised infants without consulting a medical expert.

As of April 1, 2018 the Saskatchewan Routine Childhood Immunization Schedule recommends a three-dose series of rotavirus vaccine at two, four and six months of age for children born on or after April 1, 2018. The first dose of rotavirus vaccine must be given by 104 days (14 weeks 6 days) of age and the third dose must be given by eight months less one day of age. It replaced a two-dose series which was administered to children born before April 1, 2018.

As noted in the Canadian Immunization Guide, clinical trials showed that most infants developed antibodies to the vaccine after completing a vaccine series. Efficacy of rotavirus vaccine against diarrhea of any severity in the developed world is 74% to 87% and is 85% to 98% against severe diarrhea. Countries with routine immunization against rotavirus have seen a reduction in the number of infants and children needing hospitalization and emergency department care for rotavirus by 85%. It should be noted that initial rotavirus infection frequently provides only partial immunity. Therefore, infants who have had rotavirus associated gastroenteritis before receiving the full course of the vaccine should still initiate or complete the vaccine series.

SURVEILLANCE

The Public Health Act, 1994 does not require Saskatchewan health care providers to report rotavirus cases to the local medical health officer (MHO). Reporting is not required by the Roy Romanow Provincial Laboratory (RRPL) to the Chief and Deputy Chief Medical Health Officers. However, the RRPL creates counts of positive laboratory specimens and calculates the proportion of positive specimens among specimens tested.

As rotavirus cases are not reportable, there is no provincial surveillance case definition for rotavirus.

EPIDEMIOLOGY AND VACCINE COVERAGE SUMMARY

Rotavirus in Saskatchewan

- Rotavirus vaccine was added to the Saskatchewan Routine Childhood Immunization Schedule on November 1, 2012.
- Rotavirus cases are not reported in Saskatchewan, which means case counts and characteristics are not available. However, information about positive laboratory tests and hospital stays for rotaviral enteritis is available.
- Since 2010 the number of positive laboratory tests for rotavirus in children under five years of age has dropped from 312 in 2010 to five in 2018. While this downward trend was evident before the addition of the vaccine to the schedule, it continued after the vaccine was added with the greatest one-year decrease between 2013 and 2014 from 199 to 17.
- The same trend is evident with the annual crude rate per 100,000 hospital separations for rotaviral enteritis with a downward trend in effect prior to 2012, which not only continues after 2012 but drops more steeply.

Figure 1: Positive laboratory tests for rotavirus in children less than 10 years of age, Saskatchewan, 2010-2018

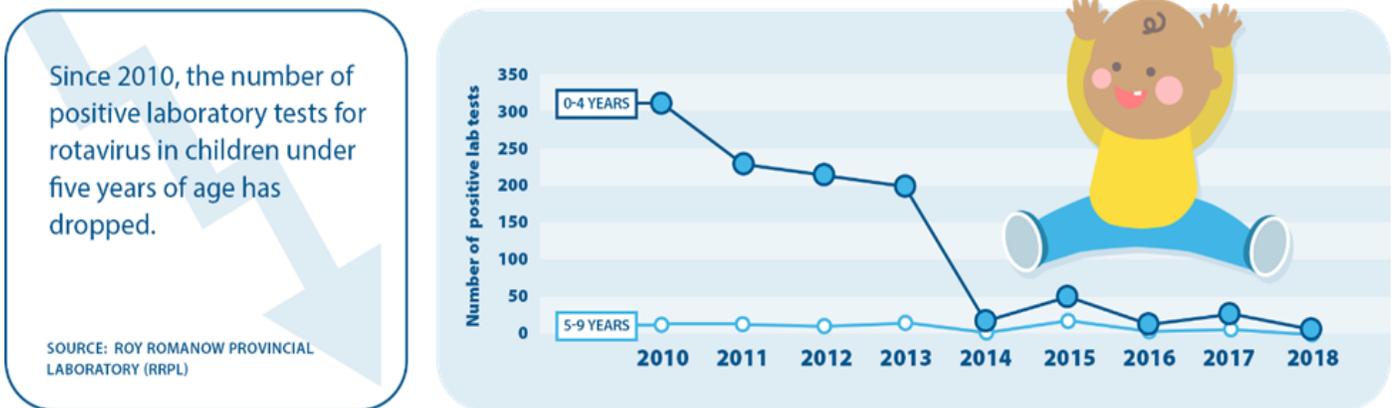
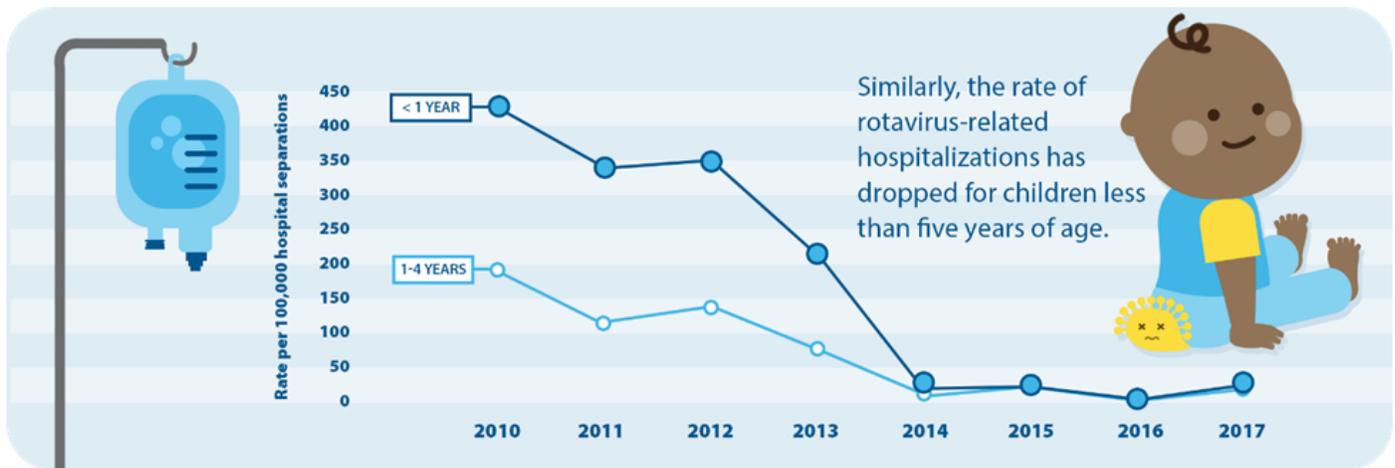


Figure 2: Annual crude rate per 100,000 hospital separations for rotaviral enteritis among children less five years of age, Saskatchewan, 2010-2017



Rotavirus Coverage in Saskatchewan: 2014 to 2018

- The Saskatchewan coverage rate for completed series by eight months of age has improved from 2014 to 2018.

Table 1: Rotavirus coverage rates (i.e., completed series) at eight months of age for Saskatchewan, 2014-2018

| 2018 | 2017 | 2016 ^a | 2015 ^a | 2014 ^b |
|------|------|-------------------|-------------------|-------------------|
| 84 | 83.6 | 83.7 | 80.4 | 80.7 |

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

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

EPIDEMIOLOGY AND VACCINE COVERAGE SUMMARY

Table 2: Rotavirus vaccine coverage by Athabasca Health Authority and former health region, 2018

| Jurisdiction (with former health region by Peer Group) | Number of infants turning 8 months of age in 2018 and registered in Panorama | | | Number of infants (% of total) immunized | | |
|--|---|------------------------|---------------|--|-----------------------------|---------------------------------|
| | required 2 dose series | required 3 dose series | total | by 91 days with 1 dose | by 5 months with 2 doses | by 8 months completed series |
| Saskatchewan | 12,581 | 1,129 | 13,710 | 11,623 (84.8) | 10,398 (75.8) | 11,518 (84) |
| Saskatchewan Health Authority | 12,557 | 1,125 | 13,682 | 11,599 (84.8) | 10,376 (75.8) | 11,493 (84) |
| Peer Group A | | | | | | |
| Regina Qu'Appelle | 3,247 | 293 | 3,540 | 3,114 (88) | 2,743 (77.5) | 3,091 (87.3) |
| Saskatoon | 4,346 | 381 | 4,727 | 3,881 (82.1) | 3,529 (74.7) | 3,891 (82.3) |
| Peer Group D | | | | | | |
| Cypress | 466 | 43 | 509 | 432 (84.9) | 391 (76.8) | 430 (84.5) |
| Five Hills | 548 | 45 | 593 | 515 (86.8) | 466 (78.6) | 502 (84.7) |
| Heartland | 467 | 43 | 510 | 420 (82.4) | 395 (77.5) | 424 (83.1) |
| Kelsey Trail | 336 | 36 | 372 | 332 (89.2) | 288 (77.4) | 328 (88.2) |
| Sun Country | 621 | 63 | 684 | 632 (92.4) | 617 (90.2) | 638 (93.3) |
| Sunrise | 551 | 32 | 583 | 496 (85.1) | 458 (78.6) | 492 (84.4) |
| Peer Group F | | | | | | |
| Athabasca Health Authority | 24 | 4 | 28 | 24 (85.7) | 22 (78.6) | 25 (89.3) |
| Keewatin Yatthé | 143 | 10 | 153 | 118 (77.1) | 97 (63.4) | 111 (72.5) |
| Mamawetan Churchill River | 142 | 13 | 155 | 126 (81.3) | 100 (64.5) | 124 (80) |
| Peer Group H | | | | | | |
| Prairie North | 914 | 102 | 1,016 | 859 (84.5) | 744 (73.2) | 835 (82.2) |
| Prince Albert Parkland | 776 | 64 | 840 | 674 (80.2) | 548 (65.2) | 627 (74.6) |

Table 3: Rotavirus vaccine coverage by Athabasca Health Authority and former health region, 2017

| Jurisdiction (with former health region by Peer Group) | Number of infants turning 8 months of age in 2017 and registered in Panorama | Number of infants (% of total) immunized | | |
|--|--|--|-----------------------------|-----------------------------|
| | | by 91 days with 1 dose | by 5 months with 2 doses | by 8 months with 2 doses |
| Saskatchewan | 13,930 | 11,581 (83.1) | 10,348 (74.3) | 11,641 (83.6) |
| Saskatchewan Health Authority | 13,900 | 11,553 (83.1) | 10,326 (74.3) | 11,614 (83.6) |
| Peer Group A | | | | |
| Regina Qu'Appelle | 3,785 | 3,196 (84.4) | 2,853 (75.4) | 3,191 (84.3) |
| Saskatoon | 4,714 | 3,873 (82.2) | 3,467 (73.5) | 3,927 (83.3) |
| Peer Group D | | | | |
| Cypress | 483 | 411 (85.1) | 368 (76.2) | 406 (84.1) |
| Five Hills | 567 | 489 (86.2) | 449 (79.2) | 497 (87.7) |
| Heartland | 501 | 418 (83.4) | 390 (77.8) | 426 (85) |
| Kelsey Trail | 385 | 343 (89.1) | 317 (82.3) | 345 (89.6) |
| Sun Country | 654 | 573 (87.6) | 558 (85.3) | 584 (89.3) |
| Sunrise | 556 | 462 (83.1) | 429 (77.2) | 462 (83.1) |
| Peer Group F | | | | |
| Athabasca Health Authority | 30 | 28 (93.3) | 22 (73.3) | 27 (90) |
| Keewatin Yatthé | 162 | 105 (64.8) | 77 (47.5) | 116 (71.6) |
| Mamawetan Churchill River | 176 | 127 (72.2) | 110 (62.5) | 132 (75) |
| Peer Group H | | | | |
| Prairie North | 1,057 | 872 (82.5) | 751 (71.1) | 856 (81) |
| Prince Albert Parkland | 860 | 684 (79.5) | 557 (64.8) | 672 (78.1) |

- Rotavirus vaccine is a time sensitive vaccine in that infants must complete the immunization series by eight months of age. There is no opportunity to catch up as there is with other antigens. For this reason two years of coverage data will be presented for infants who turn eight months of age in each calendar year, with a focus on completion of the series.
- Rotavirus vaccine is provided as a three-dose series for children born on or after April 1, 2018 and was provided as a two-dose series to children born prior to April 1, 2018.
- All infants turning eight months of age in 2017 were eligible for the two-dose series, while infants turning eight months of age in 2018 would be a mix of the two-dose and three-dose series. Therefore, the coverage rate at eight months in 2018 is for completed series (i.e., 2/2 doses and 3/3 doses depending on date of birth).
- Two years of coverage data are provided by Athabasca Health Authority (AHA) and former regional health authority (RHA). A yellow highlighted cell means the coverage rate is below the provincial coverage rate.
- At the provincial level, the coverage rate for completed series by eight months is about 84% in both years.
- At a sub-provincial level, AHA and six former RHAs exceeded the provincial coverage rate for completed series by eight months in both years.
- In 2018, 93.3% of the infants turning eight months of age in the former Sun Country RHA had completed the rotavirus vaccine series, the highest in the province.

SURVEILLANCE CASE DEFINITION

Rotavirus cases are not reported in Saskatchewan; therefore, a surveillance case definition is not available.

DATA NOTES

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. Peer groups used in this report are based on Statistics Canada's 2011 peer groupings and should not be compared to the 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-SK and NITHA communities, with the exception of those in AHA, are not currently using Panorama. Therefore, immunization data for most 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 June 1, 2019. In other words, children with Saskatchewan health coverage and registered in Panorama under FNIHB-SK or NITHA jurisdiction are excluded (including those from FNIHB-SK and NITHA communities in AHA). This means this report does not include coverage statistics for the entire provincial or regional population.