

## Chapter 9

# Mamawetan Churchill River Regional Health Authority— Delivering Provincially Funded Childhood Immunizations

### 1.0 MAIN POINTS

Under *The Regional Health Services Act*, regional health authorities (RHAs) are responsible for planning, organizing, delivering, and evaluating health services within their health regions. As part of this mandate, RHAs deliver immunizations to residents within their regions.

This chapter reports the results of our audit of processes Mamawetan Churchill River Regional Health Authority uses to deliver provincially funded childhood immunizations.

For the 12-month period ended January 31, 2017, Mamawetan had, other than the following, effective processes to deliver provincially funded childhood immunizations.

Mamawetan needs to:

- › Analyze and report childhood immunization rates by community. This will facilitate informed decision making as to where additional supports or strategies are required to increase coverage rates.
- › Consistently follow the Saskatchewan Immunization Manual for storing vaccines, managing vaccine inventory, and developing emergency event recovery plans. This would help Mamawetan properly protect its vaccines and prevent the use of ineffective vaccines.
- › Periodically give its Board coverage-rate information as it relates to provincially funded childhood immunizations. This information would enable Mamawetan to better assess the effectiveness of its immunization services.

### 2.0 INTRODUCTION

Immunization programs are designed to help prevent, control, or eliminate vaccine-preventable diseases. They do this by directly protecting vaccine recipients and indirectly protecting vulnerable individuals who may not respond to vaccines, or for whom vaccines may be harmful.<sup>1</sup>

In Canada, immunization programming is a shared responsibility between federal, provincial, and territorial governments. Provincial and territorial governments, and local public health authorities (such as Mamawetan Churchill River Regional Health Authority) undertake the planning and delivery of immunization programming for residents living off-reserve.<sup>2</sup> The Federal Government is responsible for the planning and delivery of immunization programming for residents living on-reserve. The Ministry of Health purchases and distributes all vaccines provided on and off-reserve.

<sup>1</sup> <http://healthycanadians.gc.ca/healthy-living-vie-saine/immunization-immunisation/canadian-immunization-guide-canadien-immunisation/introduction-eng.php> (28 March 2017).

<sup>2</sup> *Ibid.*



## 2.1 Immunization Services in Mamawetan

Geographically, Mamawetan Churchill River Regional Health Authority (Mamawetan) is the largest health region in northeast Saskatchewan covering nearly 25% of the province (see **Figure 1**). Its staff, about 250 full-time equivalents, work in facilities located in the communities of Creighton, La Ronge, Pinehouse, Sandy Bay, and Weyakwin.<sup>3</sup>

**Figure 1 – Mamawetan Map**



Source: Ministry of Health, 2015-16 Annual Report, p. 2.

Mamawetan provides healthcare services to over 24,000 residents in over 23 municipalities and First Nation communities. In addition, it provides public health services such as immunizations to the off-reserve communities.<sup>4</sup>

Over one-third of Mamawetan's residents are under the age of 17<sup>5</sup> (compared to less than one quarter for the province as a whole).<sup>6</sup> Almost two-thirds of those under the age of 17 live on-reserve.<sup>7</sup>

Mamawetan delivers provincially funded immunization services to about 3,000 children under the age of 17 living off-reserve in the region. Provincially funded childhood immunizations are free routine vaccines that public health nurses and other health care providers (e.g., physicians) provide to Saskatchewan residents.<sup>8</sup> For a list of provincially funded childhood vaccines (determined by the Ministry of Health), see **Section 6.0**.

The population of residents within Mamawetan is largely First Nations with about 57% of its residents living on-reserve.<sup>9,10</sup> Four First Nations in 13 communities are located within

<sup>3</sup> [www.mcrhealth.ca/our\\_region.html](http://www.mcrhealth.ca/our_region.html) (6 December 2016).

<sup>4</sup> These communities include La Ronge, Air Ronge, Creighton, Flin Flon, Denare Beach, Weyakwin, Sandy Bay, Pinehouse Lake, and Timber Bay.

<sup>5</sup> About 37%.

<sup>6</sup> About 22%.

<sup>7</sup> Statistics provided by Northern Saskatchewan Population Health Unit — 65%.

<sup>8</sup> [www.saskatchewan.ca/residents/health/accessing-health-care-services/immunization-services](http://www.saskatchewan.ca/residents/health/accessing-health-care-services/immunization-services). (28 March 2017).

<sup>9</sup> These residents live in Peter Ballantyne Cree Nation and Lac La Ronge Indian Band communities, as well as Montreal Lake Cree Nation and Hatchet Lake Denesuline First Nation.

<sup>10</sup> Statistics Canada Population Estimates, 2015 (Provided by Northern Saskatchewan Population Health Unit).

the Mamawetan region. Each of these First Nations have transfer agreements with the Federal Government to manage their own health services including immunizations.<sup>11</sup>

First Nation health authorities provide immunizations on-reserve. The Northern Inter-Tribal Health Authority<sup>12</sup> and the First Nations Inuit Health Branch of Health Canada (i.e., Federal Government) support First Nation health authorities.

## 2.2 Importance of Immunization Services

Vaccines are a cornerstone of public health. Their use has significantly contributed to the prevention and control of infectious diseases in Canada and internationally.<sup>13</sup>

Immunization programs can prevent many diseases and have a positive impact on the overall health of individuals. Since the introduction of mass immunization, infectious diseases which used to be common (such as polio), are now rare in Canada. Effective immunization programs can result in substantial savings to the health system and improvements in length and quality of life.<sup>14</sup>

Ineffective delivery of provincially funded childhood immunizations can put the public at risk due to increased transmission of preventable diseases. Children are particularly susceptible to these preventable diseases because their immune systems are less mature and therefore less able to fight infection.<sup>15</sup> Without immunizations, there is an increased risk of children having on-going health concerns that affect their quality of life. This could also lead to increased health costs.

## 3.0 AUDIT OBJECTIVE, SCOPE, CRITERIA, AND CONCLUSION

The objective of this audit was to assess the effectiveness of the processes Mamawetan Churchill River Regional Health Authority used, for the period from February 1, 2016 to January 31, 2017, to deliver provincially funded childhood immunizations.

The audit did not examine clinical decisions related to immunizations (e.g., not providing immunizations due to the health condition of an individual). In addition, the audit did not include immunizations provided for influenza or travel.

We examined Mamawetan's policies and procedures that relate to delivering provincially funded childhood immunizations, promotional items, statistical reports, and other relevant documents. We also visited two child-health clinics in Mamawetan to interview key staff (e.g., public health nurses, Medical Health Officers) and tested a sample of children's immunization records.

<sup>11</sup> The First Nations and Inuit Health Branch (FNIHB) of Health Canada directly provides some health services in Saskatchewan. FNIHB funds the majority of health services on reserve; First Nations communities and organizations deliver these services. [www.publications.gc.ca/collections/collection\\_2014/sc-hc/H34-275-2014-eng.pdf](http://www.publications.gc.ca/collections/collection_2014/sc-hc/H34-275-2014-eng.pdf) (16 December 2016).

<sup>12</sup> A First Nations' partnership organization that provides some specialized services, including immunizations, to several communities in the northern health authorities and several communities outside of the northern health authorities.

<sup>13</sup> <http://healthycanadians.gc.ca/healthy-living-vie-saine/immunization-immunisation/canadian-immunization-guide-canadien-immunisation/introduction-eng.php> (24 November 2016).

<sup>14</sup> [www.phac-aspc.gc.ca/publicat/nis-sni-03/pdf/nat\\_imm\\_strat\\_e.pdf](http://www.phac-aspc.gc.ca/publicat/nis-sni-03/pdf/nat_imm_strat_e.pdf) (28 March 2017).

<sup>15</sup> <http://healthycanadians.gc.ca/healthy-living-vie-saine/immunization-immunisation/canadian-immunization-guide-canadien-immunisation/introduction-eng.php> (28 March 2017).



To conduct this audit, we followed the standards for assurance engagements published in the *CPA Canada Handbook – Assurance*. To evaluate the Mamawetan’s processes, we used criteria based on our related work, reviews of literature including reports of other auditors, and consultations with management. Mamawetan’s management agreed with the criteria (see **Figure 2**).

**Figure 2—Audit Criteria**

<p><b>Processes to:</b></p> <ol style="list-style-type: none"><li><b>1. Promote awareness of the benefits of immunization</b><ol style="list-style-type: none"><li>1.1 Make individuals/parents/guardians aware of immunization services available (what, where, when)</li><li>1.2 Inform recipients and parents/guardians of benefits and risks of immunization</li><li>1.3 Establish strategies to reach individuals for immunization (e.g., co-ordination with schools, First Nations)</li></ol></li><li><b>2. Organize immunization services</b><ol style="list-style-type: none"><li>2.1 Maintain trained vaccine providers</li><li>2.2 Offer accessible times to immunize</li><li>2.3 Offer accessible locations to immunize</li><li>2.4 Properly manage vaccines (e.g., transfer, storage)</li></ol></li><li><b>3. Create opportunities to increase immunization coverage rates</b><ol style="list-style-type: none"><li>3.1 Work with other health service providers (e.g., Federal Government, Northern Inter-Tribal Health Authority) to maximize coverage</li><li>3.2 Follow up when recipients are not fully immunized</li></ol></li><li><b>4. Monitor immunization</b><ol style="list-style-type: none"><li>4.1 Facilitate accurate and complete immunization records</li><li>4.2 Systematically analyze key performance information on immunization (e.g., coverage rates, significant adverse events following immunization, immunization errors/incidents)</li><li>4.3 Report to senior management and Board on key information</li></ol></li></ol>
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**We concluded that for the period of February 1, 2016 to January 31, 2017, Mamawetan Churchill River Regional Health Authority had, other than the following, effective processes to deliver provincially funded childhood immunizations. Mamawetan Churchill River Regional Health Authority needs to:**

- › Periodically formally analyze and report childhood immunization rates by community to help increase coverage rates**
- › Consistently follow the Saskatchewan Immunization Manual for storing vaccines, managing vaccine inventory, and developing emergency event recovery plans**
- › Give its Board coverage rate information as it relates to provincially funded childhood immunizations**

In January 2017, the Government of Saskatchewan announced that it plans to consolidate the twelve regional health authorities—including Mamawetan Churchill River Regional Health Authority—into one Provincial Health Authority by the fall of 2017. As a result, we have directed our recommendations to the Provincial Health Authority. The Provincial Health Authority, once it is formed, is to assume responsibility for delivering provincially funded immunizations in the region covered by the Mamawetan Churchill River Regional Health Authority.

## 4.0 KEY FINDINGS AND RECOMMENDATIONS

In this section, we describe our key findings and recommendations related to the audit criteria in **Figure 2**.

### 4.1 Various Strategies to Promote Awareness

Mamawetan increases awareness about immunizations using a variety of strategies.

Mamawetan educates the public about immunizations through its promotional activities. For example, it uses posters to explain how immunizations and vaccines work, and vaccines recommended for children. It places these on bulletin boards in health centres within the region. Mamawetan also began using social media (e.g., Facebook) and local radio to promote immunization clinics.

It has six Public Health Nurse positions. Their responsibilities include the promotion and delivery of immunization programs. Some of the Public Health Nurses live in the community where they work. These nurses leverage pre- and post-natal consultations with soon-to-be or new mothers to promote the importance of immunizations. In addition, at the first post-natal home visit, Public Health Nurses routinely book the two-month immunization appointment for the child.

Mamawetan works with other health care providers (e.g., Northern Inter-Tribal Health Authority) to promote immunization awareness.

It is part of the multi-party collaborative called the Northern Healthy Community Partnership<sup>16</sup> and participates in the Babies, Books, and Bonding initiative. This initiative promotes literacy, bonding through reading, early childhood development, and encourages visits for immunizations. Parents receive free books (appropriate for age) for their children when they attend child immunization clinics in the region, at 6 months, 12 months, 18 months, and 4 years. In 2015-16, this initiative provided 2,474 books to over 750 children in over 18 communities in northern Saskatchewan.

### 4.2 Immunization Services Made Available and Altered to Meet the Needs of Recipients

Mamawetan makes immunization services readily available through its immunization clinics located in health centres in seven communities. When individuals cannot attend these set clinics, Public Health Nurses routinely alter their schedules to accommodate the needs of those individuals.

Mamawetan varies the frequency of clinics based on the size of the communities—larger communities have clinics more often.

The three larger communities (La Ronge, Pinehouse, and Creighton) offer weekly clinics with set days and times. Three communities (Weyakwin, Timber Bay, and Denare Beach) offer monthly clinics. For example, Weyakwin has an immunization clinic the fourth

<sup>16</sup> A network of organizations working to improve the health of people in northern Saskatchewan by influencing the conditions in which they live, learn, work, and play. [http://nhcp.ca/about\\_nhcp.html](http://nhcp.ca/about_nhcp.html) (28 March 2017).



Monday of each month. The last community, Sandy Bay, offers a clinic every second week. The Public Health Nurse travels from either Creighton (a distance of 318 kilometres each way) or La Ronge (a distance of 371 kilometres each way) to run the clinic.

The day before a scheduled appointment, Mamawetan staff contact the parent or recipient to confirm the appointment. If a parent / recipient cancels the appointment three times, the Public Health Nurse schedules a home visit. The Public Health Nurses use home visits to determine why the individual could not make the appointments (e.g., lack of transportation).

Public Health Nurses also accommodate individuals who present themselves for immunizations without an appointment (i.e., walk-ins).

In some communities, Public Health Nurses provide immunizations at daycares. For example, in La Ronge, the Public Health Nurse holds immunization clinics at the high school's daycare every Thursday afternoon. It uses these clinics to promote immunization and immunize children whose parents attend the high school.

In August 2016, the Ministry of Health released the *2016-17 Provincial School Immunization Strategy*. This strategy strives to have school-aged children receive immunizations for which they are eligible. The strategy targets students in grades 1, 6, and 8. The strategy includes policies and procedures for the health care providers delivering school immunizations (e.g., procedures on how to set up an immunization clinic for each grade).

Mamawetan is following the *2016-17 Provincial School Immunization Strategy*.

In two of the three communities we sampled, Mamawetan held school immunization clinics as expected.

For one community in our sample (Sandy Bay), immunizations occurred only at the immunization clinic when the nurse travelled from Creighton or La Ronge. For example, this community's immunization coverage rate of 52% for two-year-old children for pertussis (as shown in **Figure 4**) was one of the region's communities with lower immunization coverage for this vaccine. We found Mamawetan did not use other opportunities to immunize in this community (e.g., home visits, daycares, school immunization clinics). The nurse advised us that she did not have sufficient time to deliver immunizations otherwise within this community given her other public health service responsibilities. Management advised us that it had hired a Public Health Nurse in March 2017 who will reside in this community. They expect the Public Health Nurse to expand the immunization services offered in that community.

## 4.3 More Analysis of Coverage Rates Needed

### 4.3.1 Follow Ups Conducted to Increase Coverage Rates

Mamawetan actively follows up with recipients not fully immunized to increase coverage rates.

For immunizations to be effective, they must be on time and follow the childhood immunization schedule (see **Section 6.0**). Following this schedule provides the best protection against vaccine-preventable diseases.

Mamawetan, along with the other RHAs and some First Nation communities,<sup>17</sup> uses centralized provincial IT systems to maintain immunization records on individuals called Panorama.<sup>18</sup> Panorama can readily share individual case-by-case immunization status information for clients included in the system. Public health offices can access these records. Physicians can access immunization records through eHealth Viewer, which is linked to Panorama.

Each month, the Primary Care Nursing Co-ordinator uses Panorama to create a list of children that are overdue for their immunizations by community. Public Health Nurses use the list to attempt to make an immunization appointment with each recipient or parent.

If staff do not reach these individuals by phone, they send reminder letters. For those individuals without phone service, they deliver an invitation for immunization to their home. Also, for individuals that cannot come in for an appointment, the Public Health Nurse schedules home visits.

We noted that some staff use manual records (e.g., index cards), alongside Panorama, to keep track of children's immunization records. Since Panorama maintains this information, staff may be unnecessarily spending additional time updating manual records. Panorama, implemented in February 2015, is a relatively new system for staff. Mamawetan may wish to consider taking additional steps to increase staff's familiarity and comfort with the system. This may reduce the need for them keeping manual records.

### 4.3.2 Analysis of Coverage Rates by Community Needed

Mamawetan does not analyze or report immunization coverage rates by community to help determine why it is not achieving its target immunization coverage rates.

#### Analysis of Immunization Coverage Limited to Region-Wide Information

Mamawetan, similar to other RHAs in the province, limits its analysis to regional level information provided by the Ministry of Health on a quarterly basis.

Mamawetan receives quarterly reports (based on information from Panorama) from the Ministry of Health. These reports set out the average immunization coverage rates at the regional level for two-year-old and seven-year-old children for three immunizations (pertussis, measles, and meningococcal—see **Section 7.0** for Glossary).

The Ministry of Health's reported coverage rates do not include children that live on-reserve. For on-reserve information, Mamawetan receives the annual report of the

<sup>17</sup> There are five First Nation communities not using Panorama.

<sup>18</sup> In February 2015, eHealth, along with the Ministry of Health and RHAs, implemented an integrated public health surveillance IT system (known as Panorama) to replace Saskatchewan Immunization Management System (SIMS). Panorama is part of the pan-Canadian Panorama initiative funded through Canada Health Infoway. Infoway is an independent, not-for-profit organization funded by the Federal Government with a mandate to improve the health of Canadians by working with partners to accelerate the development, adoption, and effective use of digital health solutions across Canada.



Northern Inter-Tribal Health Authority<sup>19</sup> (NITHA); this annual report sets out NITHA’s overall average coverage rates.

**Figure 3—Mamawetan Childhood Immunization Coverage Rates for Pertussis, Measles, and Meningococcal (January 2016 to December 2016)**

Age Group	Pertussis Coverage Rate %	Measles Coverage Rate %	Meningococcal Coverage Rate %
2-year-old population	66.2	64.1	86.7
7-year-old population	71.0	89.5	93.1

Source: Ministry of Health, *Childhood Immunization: Coverage Statistics for 2- and 7-year-old children, Quarterly Report: December 2016*.

Mamawetan set an immunization coverage target of 95% for these types of infections. At December 2016, it is not meeting that target. For example, as shown in **Figure 3**, Mamawetan has lower coverage rates for the two-year-old population.

Management indicated that the Ministry of Health has questioned whether Mamawetan’s target is realistic and asked it to revisit the target. It suggested Mamawetan base its target on current coverage rates in 2017-18. Mamawetan plans to set a long-term strategy to improve coverage rates over time (e.g., expect an annual increase of 1% for the next five years).

**Section 5.0** compares Mamawetan’s childhood immunization 2014 coverage rates for all vaccines and age groups. It shows that Mamawetan’s 2014 coverage rates are below Saskatchewan 2014 coverage rates in most vaccine categories. For example, Mamawetan’s coverage rates for residents in the 17-year-old age group for diphtheria, meningococcal serogroup C, mumps, pertussis, polio, and tetanus are each well below Saskatchewan 2014 coverage rates.

### No Analysis of Immunization Coverage by Community

Neither Mamawetan nor the Ministry of Health analyzes and reports immunization coverage rates by community. Presently, Panorama does not provide a mechanism to analyze coverage rates on a community-by-community basis.

Rather, Mamawetan relies on the knowledge of its Public Health Nurses and their use of overdue lists. Public Health Nurses work closely with residents in their assigned communities. We found them to be knowledgeable about their communities and work to accommodate their clients’ needs (e.g., home visits). However, we also found that they were not familiar with the actual immunization coverage rates of their communities.

We found the use of trends in the average region-wide immunization rate did not provide meaningful information given the modest number of children in the region for each immunization age group (e.g., two-year old children). We noted that the number of children in each immunization age group varied significantly. For example, in December 2016, the number of two-year-old children in each community varied from 1 to 48.

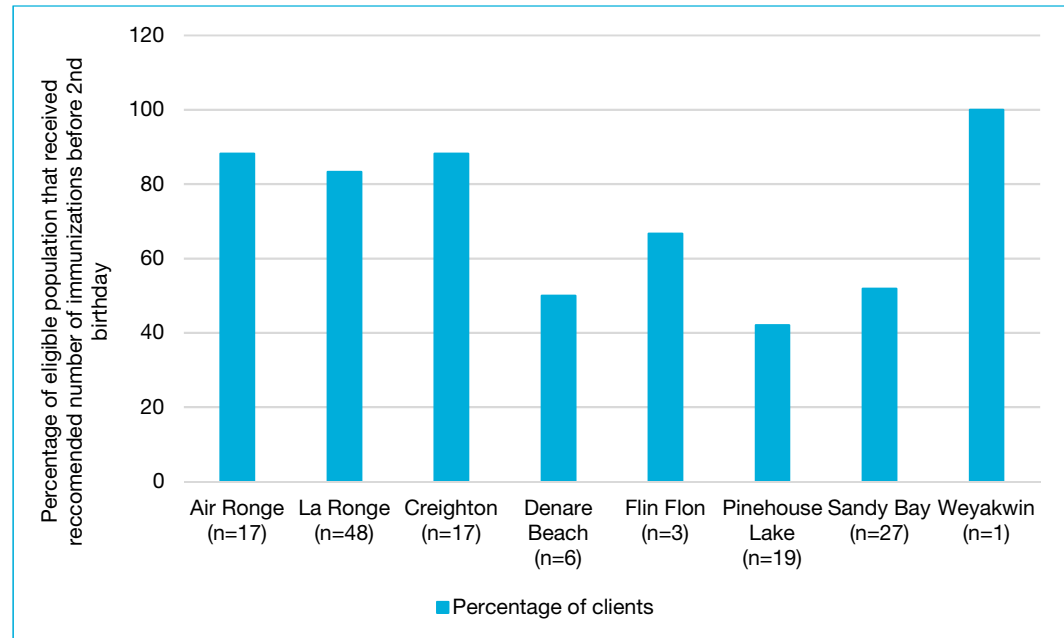
Even though Panorama does not presently provide a mechanism to analyze coverage rates by community, Mamawetan was able to do this. When we had Mamawetan analyze immunization coverage rates for two-year-old children by community, we found that

<sup>19</sup> NITHA supports the First Nation health authorities that provide immunizations to those residents living on-reserve. It is also responsible for monitoring immunization coverage rates.



coverage rates varied significantly—from 42% to 100% for pertussis (see **Figure 4**). As **Figure 3** indicates, the Mamawetan regional coverage for pertussis for two-year-old children at December 31, 2016 was 66.2%.

**Figure 4—Mamawetan Two-Year-Old Childhood Immunization Coverage Rates for Pertussis by Community**



Source: Panorama as of December 8, 2016. Prepared by Population Health Unit December 2016.

n = the number of children registered in Panorama.

Note: Timber Bay is not included in this Figure as that community did not have any two-year-old children.

Considering coverage by community shows Mamawetan requires more effort to increase the coverage rate in Sandy Bay as compared to Denare Beach. That is because at December 2016, only 3 of 6 children in Denare Beach were not up-to-date on their immunizations as compared to 13 of 27 children in Sandy Bay. As noted in **Section 4.2**, Mamawetan has hired a public health nurse for Sandy Bay.

Formally analyzing immunization coverage rates by community would help Mamawetan know whether it is putting the right amount of effort into the right communities. It may help it decide where to adjust its immunization strategies to increase coverage. We acknowledge that getting reports by community may require collaboration with the Ministry of Health and improvements to Panorama.

- 1. We recommend that the Provincial Health Authority periodically formally analyze and report childhood immunization coverage rates by community.**



## 4.4 Immunization Guidelines Set but Not Always Followed

As described below, Mamawetan does not always follow the guidelines as set out in the Saskatchewan Immunization Manual (Manual) for storing vaccines, managing its vaccine inventory, and developing emergency event recovery plans.

The Manual, available from eHealth through its website, sets out procedures for:

- › Transferring and storing vaccines
- › Managing vaccine inventory
- › Developing emergency event recovery plans
- › What information the Public Health Nurse must discuss with the individual before administering the vaccine, including the benefits and risks of receiving the vaccine
- › The informed consent that the Public Health Nurse must obtain from the recipient and/or parent prior to immunizing
- › Adverse events following immunizations

### 4.4.1 Proper Storage of Vaccines Needed

Mamawetan does not always follow procedures when storing the vaccines used for immunizations.

Mamawetan is to keep vaccines within the recommended temperature range (two to eight degrees Celsius) to maintain their effectiveness. For example, the Manual requires staff to record the minimum/maximum temperature of storage fridges twice a day using a temperature log. In addition, the storage fridges are to have a continuous temperature recorder. Recorders provide information about the length of time the vaccines may have been outside of the recommended temperature range. Staff are to monitor the recorder daily and change it weekly. Furthermore, the Manual requires regular maintenance on the storage fridges.

During the audit, we found:

- › In all three locations we sampled, staff were not consistently filling out the temperature logs twice a day. Some logs were only missing one or two entries (i.e., a morning or afternoon entry), whereas others were missing information for a number of days.
- › In two of the three locations we sampled, Mamawetan did not use the continuous temperature recorder. The storage fridge in one location did not have the continuous temperature recorder installed. In the other location, staff were not monitoring information from the recorder or replacing it weekly.
- › In two of the three locations we sampled, Mamawetan did not regularly maintain the storage fridges.

Not following the recommended storage procedures increases the risk that the vaccines may be stored outside of the recommended temperature range. Not storing vaccines within recommended temperature ranges increases the risk of them being ineffective. Ineffective vaccines could result in Mamawetan having to cancel immunization clinics due to loss of vaccines, resulting in lost opportunities to immunize. It also increases the risk that Mamawetan is unknowingly giving recipients ineffective vaccines, which would increase the recipients' susceptibility of acquiring an infection.

**2. We recommend that the Provincial Health Authority properly store vaccines as required by the Saskatchewan Immunization Manual.**

#### 4.4.2 More Monitoring of Vaccine Inventory Needed

Mamawetan does not reconcile vaccine inventory on-hand to the quantity in its records of vaccine on hand (Panorama).

Once a month, Public Health Nurses physically count the vaccines in the storage fridges. They record the quantity counted of each vaccine. However, no one compares the quantity counted to the quantity recorded in Mamawetan's records. Rather Mamawetan records are only adjusted to reflect the amount counted.

Physically counting inventory (like vaccines) periodically and comparing counts to records helps agencies to make sure their records are complete and accurate. In addition, it provides key information to help agencies manage stock levels. Furthermore, it helps identify loss and potential theft of vaccines.

Not reconciling the amount on hand to the amount expected (as reflected in Panorama) increases the risk that vaccines could have gone missing without notice. It also increases the risk that Mamawetan may acquire vaccines it does not need.

**3. We recommend that the Provincial Health Authority regularly reconcile its on-hand vaccine inventory to quantities recorded in its records.**

#### 4.4.3 Emergency Event Recovery Plans Needed

Mamawetan staff were not aware of the requirements for handling emergency events related to vaccines, and did not have an emergency event recovery plan as required.

The Manual requires every facility that stores vaccines to have a written emergency event recovery plan. The plan is to protect the vaccine inventory in situations that may compromise the vaccine storage conditions (e.g., power outages, natural disasters). It requires staff at each facility to update the plan annually.

Staff indicated that if there was an emergency, they use an informal chain of command for who to call. However, staff were unaware of the other requirements of the emergency event recovery plan. These other requirements include:



- › Arranging an alternative storage facility with backup power where the vaccines can be properly stored and monitored for the interim
- › Having written procedures for transporting the vaccines to and from the alternative storage facility, and for entering the facility and vaccine storage spaces in an emergency if the facility is closed or it is after hours

Not having a complete emergency event recovery plan, and staff fully aware of all plan requirements, increases the risk that vaccines are not properly protected. It also increases the risk of Mamawetan incurring monetary losses in the event of an emergency through loss of vaccine inventory.

**4. We recommend that the Provincial Health Authority document and make staff aware of emergency event recovery plans as required by the Saskatchewan Immunization Manual.**

#### 4.4.4 Information Properly Communicated Prior to Immunizing

Public Health Nurses are trained and knowledgeable about delivering immunizations. They properly inform the vaccine recipient and/or parent about the benefits and risks of receiving the vaccine. Public Health Nurses receive consent prior to immunizing.

Mamawetan has a robust orientation program for its Public Health Nurses delivering immunizations. Mamawetan uses the immunization competency review exam and skills checklist for immunization to assesses the knowledge of new Public Health Nurses. It grants new Public Health Nurses with suitable knowledge about immunizations an authorization to immunize certificate. It requires Public Health Nurses to obtain recertification each year.

We found that all six Public Health Nurses received the certification to immunize.

As part of receiving informed consent of vaccine recipients and/ or parents, Public Health Nurses provide them with fact sheets to describe the infection (e.g., chicken pox, pertussis), symptoms, who are at risk, how to prevent the infection, and how it is treated.

For the children's immunization records we sampled, the Public Health Nurse received consent prior to immunizing in all cases and entered in all the required immunization information into Panorama.

#### 4.4.5 Adverse Events Following Immunizations

Mamawetan had no adverse events following immunizations in 2015-16.

In some cases, children may react to a vaccine. Reactions can be mild (e.g., rashes, headache, fatigue) to severe (e.g., constriction of the airways).

The Manual describes what the Public Health Nurse must do in these situations. It also requires them to report it to the Region's Medical Health Officer.

## 4.5 Reporting of Incidents Occurring as Required

### 4.5.1 Cold Chain Breaks Properly Reported

Mamawetan properly reports all identified cold chain breaks.

As noted in **Section 4.4.1**, Mamawetan must store vaccines within a recommended temperature range. Vaccine stored outside of this range is referred to as a cold chain break. When a cold chain break occurs, Public Health Nurses must fill out the cold chain break report form (a standard form). The form includes:

- › Date break discovered
- › Location of break (e.g., during transfer or in a storage fridge)
- › Description of the break
- › Cause of the break
- › Corrective action taken
- › List of vaccines affected

The Immunization Co-ordinator receives and reviews the reports, and submits the reports to the Ministry of Health. The Ministry advises Mamawetan whether the vaccine is still okay to use or must be discarded.

From February 1, 2016 to January 31, 2017, Mamawetan had five reported cold chain breaks. We reviewed all cold chain break reports. All were properly filled out with the Ministry of Health's response attached.

### 4.5.2 Safety Reports Completed

Mamawetan follows its policy to report incidents using its client safety report form.

Mamawetan's policy requires staff to report and investigate all incidents involving patients, clients, residents, and visitors. Incidents include things such as immunization errors and cold chain breaks.

In 2016-17,<sup>20</sup> one-half (i.e., 13) of the total number of the incidents related to immunization services. We found that staff properly filled out safety reports, appropriate staff reviewed them, and staff took actions to address the issues. We also noted that none of the incidents reported resulted in harm to the individuals involved.

<sup>20</sup> April 1, 2016 to January 20, 2017.



## 4.6 Limited Reporting to the Board

The Board receives limited information on how well it delivered its immunization services.

The information the Board receives is limited to the number of individuals not receiving immunizations when expected. For example, at two meetings, the Board received this information for the region as a whole. The reports explained fluctuations in the numbers (e.g., staffing issues).

At four meetings, the Board received information about overdue clients by community with some trends identified. However, it did not receive analysis on these trends.

The Board does not receive any information on the immunization coverage rates for the region or by community, or whether the Region's immunization coverage rates meet the Region's target. As noted in **Section 4.3.2**, Mamawetan is not achieving its target immunization coverage rates.

Without adequate reporting, the Board can not determine whether Mamawetan's immunization services are effective (is it providing the right level of services in the right locations) and it may not make informed decisions about the Region's immunization services.

**5. We recommend that the Provincial Health Authority periodically give its Board coverage rate information as it relates to provincially funded childhood immunizations.**

## 5.0 MAMAWETAN CHILDHOOD IMMUNIZATION 2014 COVERAGE RATES AS COMPARED TO PROVINCIAL COVERAGE RATES

The table below compares Mamawetan and the province's average childhood immunization coverage rates by each type of vaccine and age group for 2014. 2014 was the most current comparative information available at February 2017. We obtained the information below from Saskatchewan's centralized immunization IT system.

The blue shaded cells reflect areas where Mamawetan's coverage rate is lower than the provincial average.

Vaccine	Age Group (number of recommended doses by that age)	Saskatchewan Coverage Rate % (2014)	Mamawetan Coverage Rate % (2014)
Diphtheria	2 years (4 doses)	75.7	70.9
	7 years (5 doses)	78.0	82.9
	17 years (6 doses)	75.1	54.7
Haemophilus influenza type b	3 months (1 dose)	84.1	71.0
	5 months (2 doses)	73.7	55.1
	8 months (3 doses)	76.2	59.6

Vaccine	Age Group (number of recommended doses by that age)	Saskatchewan Coverage Rate % (2014)	Mamawetan Coverage Rate % (2014)
Hepatitis B	13 years (2 doses)	81.9	59.6
	15 years (3 doses)	71.6	41.9
	17 years (2 doses)	89.7	72.8
Human Papilloma Virus (HPV)	13 years (3 doses)	72.8	56.0
	15 years (3 doses)	78.5	69.5
	17 years (3 doses)	75.4	67.2
Measles	2 years (2 doses)	75.9	74.4
	7 years (2 doses)	91.1	95.3
	17 years (2 doses)	96.5	93.0
Meningococcal serogroup C	2 years (1 dose)	87.8	91.9
	7 years (1 dose)	93.1	96.4
	17 years (1 dose)	91.3	72.8
Mumps	2 years (2 doses)	75.6	74.4
	7 years (2 doses)	90.7	94.9
	17 years (2 doses)	89.5	71.6
Pertussis (i.e., whooping cough)	2 years (4 doses)	75.7	70.9
	7 years (5 doses)	77.8	82.5
	17 years (6 doses)	74.3	54.7
Pneumococcal	3 months (1 dose)	84.0	71.8
	5 months (2 doses)	73.5	55.1
	8 months (2 doses)	87.7	88.0
Polio	2 years (4 doses)	75.5	70.9
	7 years (4 doses)	85.5	90.2
	17 years (4 doses)	91.1	80.7
Rotavirus	3 months (1 dose)	81.1	68.5
	5 months (2 doses)	70.2	52.7
	8 months (2 doses)	80.7	72.3
Rubella	2 years (2 doses)	75.6	74.4
	7 years (2 doses)	90.7	95.3
	17 years (2 doses)	96.2	93.0
Tetanus	2 years (4 doses)	75.7	70.9
	7 years (5 doses)	78.0	82.9
	17 years (6 doses)	75.2	54.7
Varicella	2 years (2 doses)	74.9	74.4
	7 years (1 dose)	89.4	90.5
	17 years (1 dose)	20.2	19.8

Source: Ministry of Health, Vaccine Preventable Monitoring Reports based on data in the Saskatchewan Immunization Management System (SIMS). Data does not include vaccines delivered out of province or by First Nations Communities who declined to use SIMS. As such, immunization data should not be viewed as complete.



## 6.0 LIST OF PROVINCIALY FUNDED CHILDHOOD VACCINES

Childhood Immunization Schedule	
Age/Grade Child Should Receive Immunization	Vaccines
2 months	<ul style="list-style-type: none"> <li>› DTaP-IPV-Hib (Diphtheria, Tetanus, acellular Pertussis, inactivated Polio, Haemophilus influenza type b)</li> <li>› Pneumococcal conjugate 13</li> <li>› Rotavirus</li> </ul>
4 months	<ul style="list-style-type: none"> <li>› DTaP-IPV-Hib (Diphtheria, Tetanus, acellular Pertussis, inactivated Polio, Haemophilus influenza type b)</li> <li>› Pneumococcal conjugate 13</li> <li>› Rotavirus</li> </ul>
6 months	<ul style="list-style-type: none"> <li>› DTaP-IPV-Hib (Diphtheria, Tetanus, acellular Pertussis, inactivated Polio, Haemophilus influenza type b)</li> </ul>
12 months	<ul style="list-style-type: none"> <li>› MMRV (Measles, Mumps, Rubella, Varicella)</li> <li>› Meningococcal conjugate C</li> <li>› Pneumococcal conjugate 13</li> <li>› Hepatitis A<sup>^</sup></li> </ul>
18 months	<ul style="list-style-type: none"> <li>› DTaP-IPV-Hib (Diphtheria, Tetanus, acellular Pertussis, inactivated Polio, Haemophilus influenza type b)</li> <li>› MMRV (Measles, Mumps, Rubella, Varicella)</li> <li>› Hepatitis A</li> </ul>
4-6 years	<ul style="list-style-type: none"> <li>› DTaP-IPV (Diphtheria, Tetanus, acellular Pertussis, inactivated Polio)</li> </ul>
Grade 6	<ul style="list-style-type: none"> <li>› Hepatitis B</li> <li>› Meningococcal conjugate ACYW-135</li> <li>› HPV (Human Papillomavirus) (girls only)</li> <li>› Varicella</li> </ul>
Grade 8	<ul style="list-style-type: none"> <li>› Tdap (Tetanus, Diphtheria, acellular Pertussis)</li> </ul>

Source: Ministry of Health, Routine Immunization Schedule 2016.

<sup>^</sup> People born since January 1, 1982, who live in Keewatin Yatthé, Athabasca, or Mamawetan Churchill River health authorities or on reserves in Saskatchewan (excluding Creighton, Air Ronge, and La Ronge) receive hepatitis A vaccine regardless of where they are accessing services (e.g., RHA or First Nations jurisdiction).

## 7.0 GLOSSARY

**Diphtheria** – A serious bacterial infection of the nose and throat which can result in severe breathing problems, heart failure, and paralysis.

**Haemophilus influenza type b** – A bacterial infection that can cause serious and life-threatening infections of the lining that covers the brain, the blood, and the throat. Despite the name, it is not the same as influenza.

**Hepatitis A** – A virus that infects the liver that can cause fatigue, nausea and jaundice (yellowish discoloration of the skin).

**Hepatitis B** – A virus that infects the liver that can cause permanent scarring and damage, liver cancer, and death.



**Human papillomavirus (HPV)** – A common sexually transmitted infection that can cause mouth, nose, throat, anal, cervical, vaginal, and penile cancers.

**Measles** – A virus that causes a fever, rash, and cold-like symptoms, and can cause ear infections and pneumonia. Severe cases can lead to seizures, deafness, or permanent brain damage.

**Meningococcal disease** – A bacterial disease that causes serious, life-threatening infections including meningitis and septicemia. Complications include limb amputation, permanent hearing loss, permanent brain damage, seizures, and skin scarring.

**Mumps** – A virus that causes a fever and swelling of the salivary glands. Severe cases can lead to permanent brain damage.

**Pertussis** – Also called whooping cough. A serious bacterial infection of the lungs and throat which can cause pneumonia, convulsions, brain damage, or death.

**Pneumococcal disease** – A bacterial disease that can cause serious and life-threatening infections in the lungs, the lining that covers the brain, and the blood.

**Polio** – A disease caused by a virus which can result in paralysis of arms or legs and even death.

**Rotavirus** – A virus that causes severe diarrhea in babies and young children.

**Rubella** – A virus that causes a fever, a rash, swollen lymph glands, and joint pain.

**Tetanus** – Also called lockjaw, which causes painful tightening of muscles all over the body.

**Varicella** – Also called chicken pox. A virus that causes a fever and an itchy rash with blisters. Complications include bacterial skin, soft tissue and bone infections; blood infections; pneumonia; flesh eating disease; and stroke.

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