

**IMMUNIZATIONS IN NOTRE DAME DE LOURDES**

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Home for the Summer Program – June 12 to July 21, 2017

Notre Dame de Lourdes, Manitoba

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## BACKGROUND

I had the opportunity to participate in the Home for the Summer program in the town of Notre Dame de Lourdes. The town is located an hour and a half south-west of Winnipeg, in the Rural Municipality of Lorne, which belongs to Southern Health-Santé Sud. I spent six weeks working in the personal care home, clinic, and the brand new hospital, alongside doctors, nurses, a nurse practitioner, public health, and medical residents. The health centre in Notre Dame de Lourdes serves the people in the town and in neighbouring communities. A significant portion of the population consists of Francophones, but also includes Filipino immigrants and Hutterites colonies, among others. According to the 2016 census, Note Dame de Lourdes has a population of 744, with 55% of the population between the ages of 15 and 64, 18% are younger, and 26% are older<sup>1</sup>. Having an interest in pediatrics and infectious diseases, I decided to focus my project on immunizations in the town and surrounding areas.

## INTRODUCTION

The Manitoba Government has published a recommended immunization schedule, depicted in Figure 1, to help families and health care providers optimize the health of young patients<sup>2</sup>.

Vaccine Name	Age of Child					
	2 months	4 months	6 months	12 months	18 months	4-6 years
<a href="#">Diphtheria, Tetanus, Pertussis, Polio, Haemophilus influenzae type b (DTaP-IPV-Hib)</a>	◆	◆	◆		◆	
<a href="#">Pneumococcal Conjugate 13 valent (Pneu-C-13) ^</a>	◆	◆		◆		
<a href="#">Rotavirus</a>	◆	◆				
<a href="#">Measles, Mumps, Rubella, Varicella (MMRV)</a>				◆		◆
<a href="#">Meningococcal C Conjugate (Men-C-C) Vaccine</a>				◆		
<a href="#">Tetanus, Diphtheria, Pertussis, Polio (Tdap-IPV)</a>						◆
<a href="#">Influenza (Flu)</a>	The seasonal influenza program may vary each year. <a href="#">Click here</a> for current information on the seasonal influenza vaccine.					

◆ = A single dose given with one needle.

Figure 1. Recommended Immunization Schedule for infants and pre-school children, taken from the Manitoba Government website<sup>2</sup>.

Based on a report issued by the Government of Manitoba, the vaccination rates in 2014 for 1 and 2 year old children in the Southern Health RHA were consistently up to 12% lower than the average vaccination rate for 1 and 2 year olds in Manitoba<sup>3</sup>. According to the 2014 report, 77.9% of 1 year olds in Manitoba received all immunizations required to be considered completely immunized for their age. In comparison, Southern Health was the Regional Health Authority with the lowest vaccination rate, with only 67.9% of 1 year olds being fully vaccinated. The trend is similar for 2 year olds in the province. In 2014, 65.5% of 2 year olds in Manitoba received the vaccinations required to be considered fully immunized, while Southern

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Health was again the RHA with the lowest vaccination rate, with only 56.1% of its 2 year olds being fully vaccinated<sup>3</sup>.

According to the 2014 Immunization Report issued by the Government of Manitoba, public health nurses are the health providers that administer vaccinations the most in Manitoba, with having administered 49.9% of all vaccinations to children between birth and 17 years old, while physicians administered 47.5% of all vaccinations provided to that age group<sup>3</sup>. In 2014, the Winnipeg RHA is the only RHA in Manitoba where physicians administer the majority of vaccinations. In all other RHA's in Manitoba, public health nurses administer over 80% of vaccinations. Specifically, in Southern Health, public health nurses administered 80.9% of vaccinations in 2014 while physicians administered 18.7% to children aged 0 to 17<sup>3</sup>. These figures do not include influenza vaccines.

Southern Health-Santé Sud in the Regional Health Authority that spreads across the Southern portion of Manitoba, and provides health care to 197,000 residents in various Rural Municipalities, Municipalities, cities, towns, villages, and First Nation communities<sup>4</sup>. In order to improve immunization rates in this RHA, it is necessary to first understand why the current immunizations rates are considerably lower than the provincial average, and which areas of the RHA demonstrate the most resistance to vaccinations.

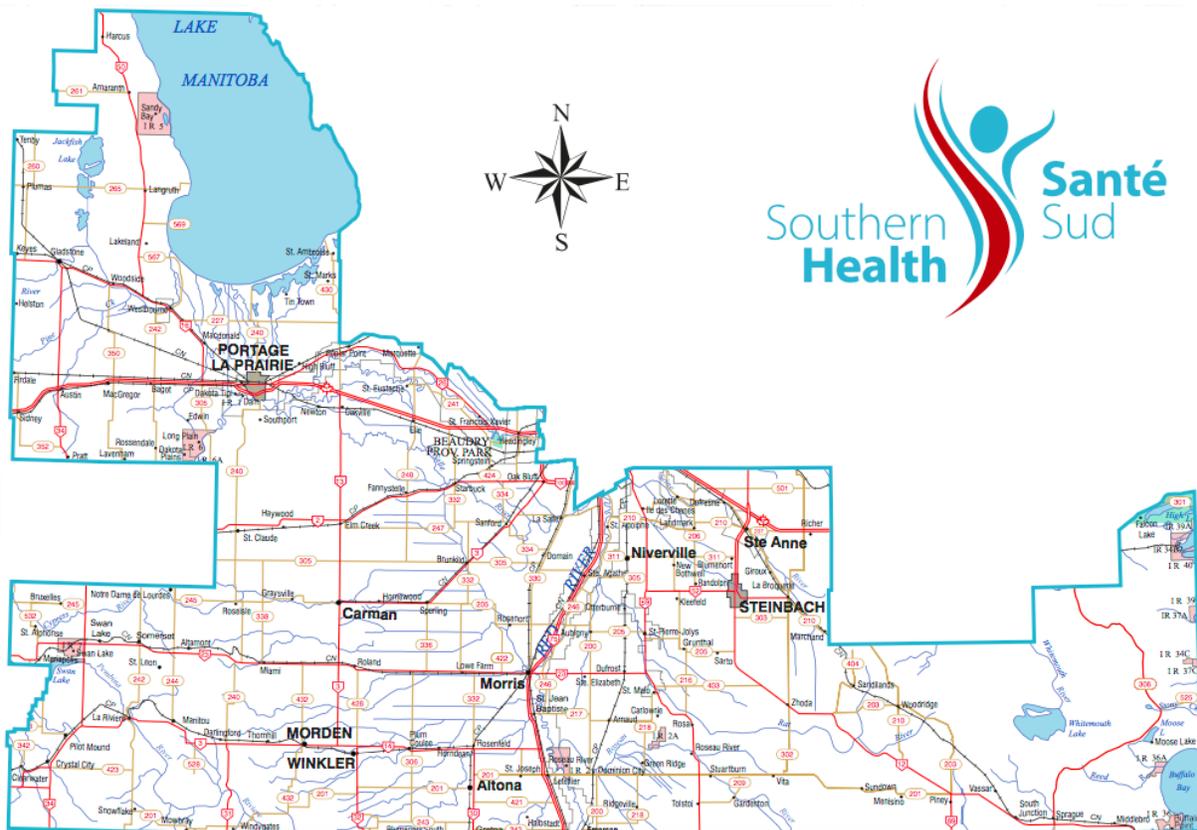


Figure 2. A map of the areas in Manitoba that are covered by Southern Health-Santé Sud. The map was obtained from the Southern Health website<sup>4</sup>.

The first objective of this research study is to determine how the population in Notre Dame de Lourdes contributes to the immunization rates documented for Southern Health. This will be

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achieved by comparing immunization rates in Notre Dame de Lourdes to immunization rates in Southern Health. The second objective is to understand why patients choose to vaccinate or not vaccinate their children, in order to provide the public with targeted education about vaccinations. This will be achieved by asking parents to complete a survey and by having a discussion with a public health nurse.

## **METHODS**

### Part 1: PANORAMA REPORT

In order to determine how immunization rates in Notre Dame de Lourdes compare to those in Southern Health and to the Manitoban average, data must be collected. A public health nurse in Southern Health was able to provide assistance with this portion of the study by looking at vaccinations for children under 2 years old with a postal code of ROG 1M0, which corresponds to the town of Notre Dame de Lourdes. Due to challenges involved with producing this data from Panorama, it was not possible to look at data for children up to 10 years old. Using this age and postal code criteria, Public Health was able to determine the number of children who were overdue for their vaccinations. Since this information was obtained by using the postal code in Notre Dame, it is not exactly representative of the population attending the clinic. Some individuals who live in Notre Dame doctor in other towns, and some individuals from other towns doctor in Notre Dame.

### Part 2: SURVEY

A survey about vaccinations was created and distributed to eligible participants presenting to the clinic for appointments. Eligible participants for the survey were parents/guardians with any children aged 10 or younger. The survey requested participants to indicate the age of their children, whether or not their children received their 1 and 2 year old vaccinations by the age of 3, and to provide any reasons they had for their choice. Parents were asked to provide their own reasons instead of choosing from a list of options to avoid influencing their response. The survey was handed out and collected by the staff at the reception desk. Names were not required on the survey to provide anonymity to patients in order to encourage honesty. Since this information was obtained by surveying patients at the Notre Dame Clinic, it is not exactly representative of the population in Notre Dame de Lourdes. Some individuals who live in Notre Dame doctor in other towns, and some individuals from other towns doctor in Notre Dame.

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If you are a parent with children aged 10 or younger, please take a minute to fill out this survey. The data will be used for a research project conducted by a first year medical student at the University of Manitoba.

Have your children received the vaccinations recommended by the age of 3 in the Government of Manitoba's Recommended Immunization Schedule?\*

Please complete one row per child.

Child's Age	Please check one of the following:			Please provide the reason why you chose to vaccinate or not vaccinate your child.
	Yes, my child is up to date with all of their vaccinations	My child has only received some of their vaccinations	No, my child is not vaccinated	

\*Vaccinations recommended by the age of 3 in the Government of Manitoba's Recommended Immunization Schedule include: 4 doses of DTaP-IPV-Hib, 3 doses of Pneu-C-13, 2 doses of rotavirus, 1 dose of MMRV, and 1 dose of Men-C-C.

Thank you for taking the time to complete this survey, your input is valued.

Figure 3. Copy of the survey distributed to parents with children aged 0 to 10 years old when presenting to the Notre Dame Clinic for an appointment between June 26, 2017 and July 21, 2017.

Part 3: DISCUSSION WITH PUBLIC HEALTH

Based on the statistics regarding which health care providers administer vaccinations in rural Manitoba, the public health nurse at the Notre Dame Clinic would be a valuable resource to better understand parents’ decisions to refuse vaccinations for their children. A meeting was organized with the public health nurse to discuss her experience with parents who opt to not have their children vaccinated and the reasons they provide for their choice.

**RESULTS**

Part 1: PANORAMA REPORT

The data search by the public health nurse was done by forecast status using the system Panorama<sup>5</sup>. The search determined that there are 18 children under the age of 1, and 38 children 1 year of age, that fit the criteria of having the postal code R0G 1M0 while being under the age of 2 years old. Children with a forecast status of “overdue” can be given that status for different reasons, but it is not possible for me to determine which reason is applicable. Children who are listed as “overdue” are either children who have received some immunizations but are past the due date for another vaccination, as per the Manitoba vaccination schedule, or they are children who have received some vaccinations but whose parents do not want them to receive a particular vaccine, or they are children who are not immunized at all. Based on the data received, it is not possible to know whether the children listed as overdue for one vaccine are the same children who are overdue for other vaccines. The following table summarizes the data obtained from the Panorama report.

Table 1. Summary of Forecast data from Panorama, provided by a public health nurse in Southern Health. There are 18 children under the age of 1, and 38 children with the age of 1 who have a postal code of R0G 1M0.

Vaccine	Children < 1 year old		Children 1 year old	
	# overdue	% overdue	# overdue	% overdue
DTaP-IPV-Hib	4	22.2	3	7.9
Pneu-C-13	2	11.1	4	10.5
Rotavirus	0	0.0	0	0.0
MMRV	0	0.0	4	10.5
Men-C-C	0	0.0	4	10.5

The vaccine with the greatest percentage of overdue children under the age of 1 is the DTaP-IPV-Hib vaccine, with 22.2% of children in that age category being overdue. The Pneu-C-13, MMRV, and Men-C-C vaccines all have the highest percentage of overdue 1 year old children, with 10.5% of children in that age category being overdue for each of those three vaccines. There are no children in either age category who are overdue for the rotavirus vaccine. There are no children under that age of 1 who are overdue for the MMRV or Men-C-C vaccines because they are not yet old enough to be eligible for those vaccinations.

Based on the data provided in Table 1, up to 6 children under the age of 1, or 33.3%, are not up to date with their vaccinations. Up to 15 children between the ages of 1 and 2, or 39.5%,

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are not up to date with their vaccinations. If working under the assumption that the children who are overdue for one vaccine are the same children who are overdue for other vaccines, it can be deduced that up to 22.2% of children under the age of 1 are not up to date with their immunizations, and up to 10.5% of children aged 1 year are not up to date with their immunizations. Therefore, based on the data from the Panorama Report provided by a public health nurse in Southern Health, between 22.2% and 33.3% of children under the age of 1 with postal code ROG 1M0 are not up to date with their immunizations, and between 10.5% and 39.5% of 1 year old children with postal code ROG 1M0 are not up to date with their immunizations.

### Part 2: SURVEY

I obtained responses regarding the immunization status of 47 children, belonging to 21 different families. The following graph represents the distribution of responses:

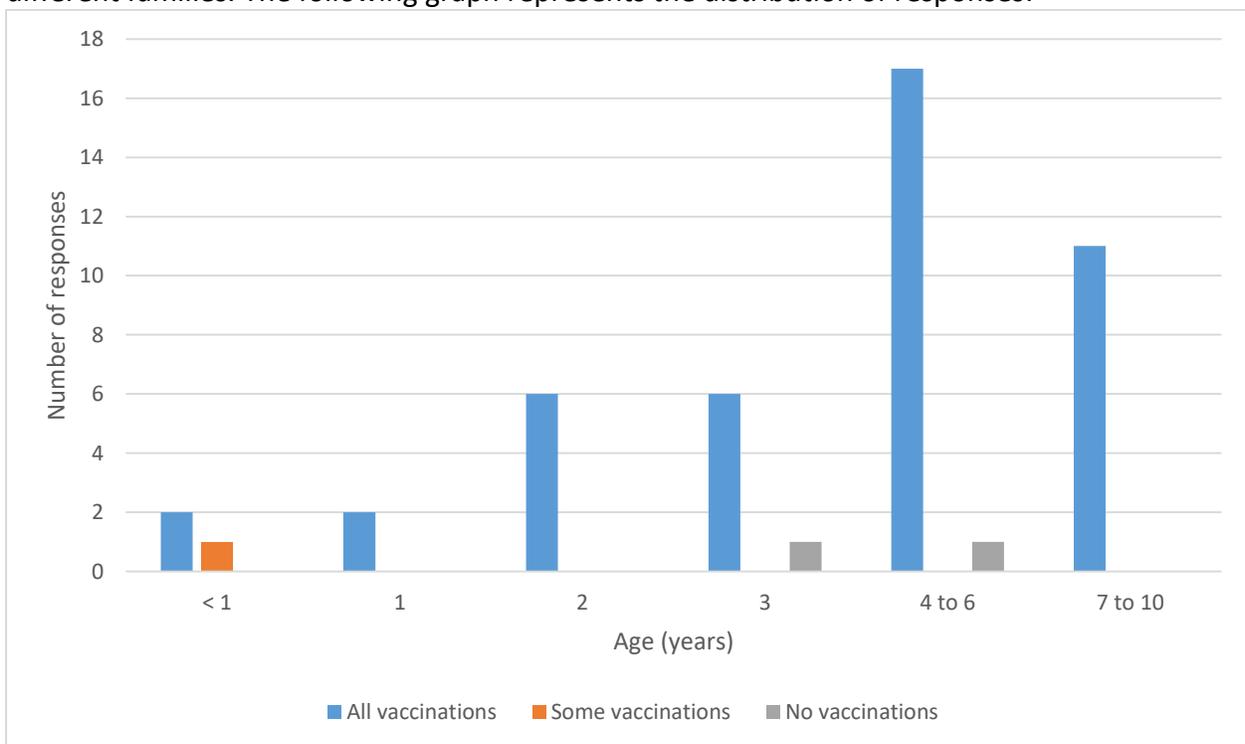


Figure 4. Graph of the distribution of responses from the survey distributed to patients at the Notre Dame Clinic.

The results provided in Figure 4 demonstrates that out of the 47 children included in the data, 44 of them, or 93.6%, had received all recommended vaccinations for children aged 2 years and younger. Only one child, or 2.1% of participants, had received some but not all recommended vaccinations. Two children, or 4.3% of participants, were not vaccinated.

The following three tables show the written reasons that parents and guardians provided for vaccinating or not vaccinating their children:

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Table 2. Reasons provided by parents/guardians of children who are up to date with all their vaccinations.

“Keep him and others protected and immune to diseases and viruses”
“I chose to vaccinate my child to protect them from disease and to reduce the risk of infections”
“Contrary to the current belief that vaccines cause more harm than good, I strongly believe that vaccines are safe and help the kids fight illnesses that previously severely injured kids or killed them”
“I want them to be healthy and prepared for the world”
“It is the best form of protection for them against many disease/illnesses”
“Seemed like the appropriate thing to do. Myself and my spouse updated ours as well. Peace of mind”
“Because I want them to be protected”
“To avoid the spread of these diseases that are coming back and for my child not to get them”
“Some places don’t accept children that aren’t vaccinated. Not pro or anti vaccine. Don’t agree with everything that’s in them but do believe that if it prevents illness that it’s something that is necessary”
“I believe that it helps protect them from viruses that could harm them now or in the future”
“Vaccines save lives. I will do everything to protect my child”
“For the health of my children”
“To prevent her from getting sick and to prevent the spread of disease”
“Exposure to other communities through travel”

Table 3. Reasons provided by parents/guardians of children who have only received some of their vaccinations.

“To be done soon”
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Table 4. Reasons provided by parent/guardians of children who are not vaccinated.

“Multiple reasons – self-education as well as from health professionals. Still doing research but definitely a ‘delayed’ vaccinator. Not enough studies done, especially when given multiple vaccinations all at one time together.”
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### Part 3: PUBLIC HEALTH DISCUSSION

The public health nurse who works in the Notre Dame de Lourdes Clinic agreed to speak with me about her experience with administering vaccinations and having conversations about immunizations with families in the area, and in other Southern Health areas where she has worked<sup>6</sup>. She provided me with a list of reasons that families have given her when choosing not to vaccinate their children, as well as other reasons that she has observed. In her opinion, patient misinformation and influence from the media are the foundation of many of the main reasons parents/guardians choose to not have their children immunized. Following is the complete list of reasons why parents/guardians do not have their children vaccinated, in no particular order, as identified by the public health nurse in Notre Dame de Lourdes:

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### 1) *Chiropractors*

The founder of chiropractic, Daniel David Palmer, strongly opposed the use of vaccinations to protect people. To this day, some chiropractors still agree with Palmer's belief, and advise their clients to not get themselves or their children immunized.

### 2) *Hutterite colonies*

Vaccination rates among the Hutterite population changes in waves, with numbers peaking when an outbreak of a disease occurs. Numbers then start to decrease again once that outbreak ends.

### 3) *New vaccinations*

The newest vaccination to be added to the infant and pre-school immunization schedule is to protect children against rotavirus. Similarly to when the varicella vaccination was introduced, the addition of the rotavirus vaccination was not well-received by all parents, specifically parents who had older children. The reason provided by parents/guardians to immunize their children with all vaccinations except rotavirus was that their other children didn't get it so neither should this child.

### 4) *Conspiracy theories*

Some individuals believe that vaccinations provide no benefit and are part of a conspiracy created by the government. Injecting small microchips to track individuals is one of the conspiracy theories that exists.

### 5) *Thimerosal*

Thimerosal is a compound present in vaccinations in the United States of America, and is only present in combination flu vaccines in Canada (vials used for more than one dose). Some American TV shows hosted by doctors have raised concerns about the mercury content in thimerosal, leading some individuals to believe that vaccinations are dangerous for their children. Studies have shown that the level of mercury present in thimerosal is much smaller than levels present in certain foods, such as tuna, and that there is no known harm caused by thimerosal in vaccinations.

### 6) *Doses*

Some parents think that children are given too many vaccinations at once, and request that the combination vaccinations (ex: Tdap) are administered separately, an option that is available in the United States.

### 7) *Autism*

Despite the fact that the original study linking autism to vaccines has been discredited, some parents still fear that it is possible for their children to develop autism because of a vaccine, especially the MMR vaccine. Some parents still have this belief even after being explained that autism and vaccinations are correlated in time but are not linked to each other.

### 8) *Natural disease*

Some parents think that getting the disease naturally is better for their child than getting the vaccination.

### 9) *Immigrants*

Although some immigrants decide to vaccinate their children, others, specifically some immigrants from Mexico, Ukraine, and Russia, choose not to because vaccinations are not mandatory in Manitoba.

*10) Religion*

Individuals with certain religious beliefs, notably some members of the Baptist or Pentecostal faith, believe that their god will save them from any harm that can come from infections and diseases, and therefore don't require vaccines.

*11) Eradication*

Some people believe there is no use in vaccinating their children against these diseases because they believe that the pathogens have been eradicated and are therefore not a threat to their children.

*12) Vaccine production*

Some individuals are strongly opposed to immunizing their children because they think that vaccines are produced in aborted fetuses.

*13) Sensitive topics*

Although the HPV vaccine is not one of the vaccines included in this study because it is given at an older age, it is important to note that some parents do not vaccinate their children against HPV because they are not comfortable with the thought of their children having sexual intercourse, or believe that their children are not at risk for sexually transmitted infections.

## **DISCUSSION**

According to the 2014 Immunization Report issued by the Government of Manitoba, 67.9% of 1 year olds and 56.1% of 2 year olds belonging to Southern Health were considered being fully vaccinated. The Manitoba averages for vaccinations are 77.9% of 1 year olds and 65.5% of 2 year olds being considered fully immunized.

Based on the data from Panorama, provided by a public health nurse in Southern Health, between 22.2% and 33.3% of children under the age of 1 with postal code R0G 1M0 are not up to date with their immunizations, and between 10.5% and 39.5% of children of the age of 1 with postal code R0G 1M0 are not up to date with their immunizations. This data shows that at least 66.7% of children under the age of 1 and at least 63.5% of children of the age of 1 with postal code R0G 1M0 are up to date with their immunizations, as per the recommended schedule in Manitoba. If the children who are overdue for one vaccine are the same children who are overdue for the other vaccines, then 77.8% of children under the age of 1 and at least 89.5% of children aged 1 year with postal code R0G 1M0 are up to date with their immunizations, as per the recommended schedule in Manitoba. Because of the inability to determine the true immunization rates in Notre Dame de Lourdes based on the data obtained with Panorama by the public health nurse, it is difficult to compare this data to the data from the 2014 Immunization Report and from the survey.

In comparison, 93.6% of children included in the survey at the Notre Dame Clinic had received all recommended vaccinations for children aged 2 years and younger.

The results from the Panorama data and survey differ from the data presented for Southern Health in the 2014 immunization report from the Government of Manitoba. There are different possible reasons why this is the case. Firstly, the data from the survey and from the search by public health were collected differently and the criteria differed slightly, therefore

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discrepancies are expected. Secondly, it is possible that the immunization rates in Notre Dame de Lourdes are in fact higher than the average rates in Southern Health.

Compared to the Southern Health averages of 67.9% of 1 year olds and 56.1% of 2 year olds being considered fully immunized, the immunization rate in Notre Dame based on the survey, 93.6%, is better than the RHA average. Although the data from Panorama was inconclusive, the range of possible immunization rates of 66.7 – 77.8% of children under the age of 1 and 63.5 – 89.5% of 1 year olds with a Notre Dame postal code is similar or higher than the Southern Health average.

Compared to the Manitoba averages of 77.9% of 1 year olds and 65.5% of 2 year olds being considered fully immunized, the immunization rate in Notre Dame based on the survey, 93.6%, is better than the provincial average. The data from Panorama was inconclusive, and the range of possible immunization rates of 66.7 – 77.8% of children under the age of 1 and 63.5 – 89.5% of 1 year olds with a Notre Dame postal code shows that the immunization rates in Notre Dame are either lower, similar or higher than the provincial average.

Assuming that the data from the survey conducted is representative of the true immunizations rates in Notre Dame de Lourdes, then this information indicates that this area of Manitoba is not one with higher than average rates of children who are susceptible to preventable infections.

The information retrieved from the survey is either representative of the population in Notre Dame, or the data is skewed. There are many factors that could have skewed the data from the survey. Firstly, only 47 responses were collected from patients, giving the study a small sample size. Secondly, the study was only conducted for five weeks, which severely limits the number of participants, and results in data that is less representative of the entire population of the town. Thirdly, the survey was distributed by staff at the front desk so it is possible that not all eligible participants who presented to the clinic were asked to complete the survey. Fourthly, some patients who were eligible to participate in the survey may have refused to complete the survey. The fifth reason is that although the patient's name was not required on the survey, patients may have felt that the survey was not anonymous since the completed survey was handed back to the staff at the front desk. Therefore, some participants may not have felt comfortable providing an accurate response. Another reason why the data could be skewed is the possibility that parents who choose not to vaccinate their children are also less likely to seek medical attention for other reasons, and therefore do not visit the clinic as often as families who do have vaccinated children.

The second objective of this study was to determine the reasons why patients in Southern Health, specifically in Notre Dame de Lourdes, choose to not have their children vaccinated.

The most common reason that parents provided in the survey to explain why they chose to vaccinate their children was to protect their children against preventable diseases. There was only one child who has only received some of the vaccinations that they are eligible for, but the parent stated that they were just late to get the next set of vaccinations done. The parent who has chosen to not vaccinate their children stated that they decided this based on their research but did not state what all of their sources of information were.

Due to the fact that there were a limited number of participants who stated that their children were not vaccinated, the study relies more heavily on the responses collected from the public health nurse at the clinic. The public health nurse has worked in various communities in

Southern Health and the reasons she provided include reasons that patients have shared with her in clinic, as well as reasons that she knows about from her profession. In her opinion, patient misinformation and influence from the media are the foundation of many of the main reasons parents/guardians choose to not have their children immunized. Although she was able to provide her opinion as to which reason is the most common in this area, it is unknown whether or not it matches the true most common reason.

It would be beneficial to determine which regions in Southern Health are contributing the most to the lower than average immunization rates in this Regional Health Authority. A survey can be distributed to parents attending those clinics to determine why they are choosing not to vaccinate their children. The reasons they provide will help the RHA better understand why the immunization rates are low in those areas and determine how to specifically target those particular populations. The parent who responded to the survey by stating that her children are not immunized, did not provide sources for the information she found that led to her making that decision. It would be beneficial to know the sources of information for parents who are choosing to not vaccinate their children, because that would allow healthcare professionals to inform parents about which sources are credible and scientifically based, and which sources are opinion based. Clinics could provide a list of credible sources to parents who want to research immunizations before deciding whether or not their children will be vaccinated. It would also be important to ensure that parents are looking at sources about vaccines that are applicable to vaccines in Canada. For example, other than the combination flu vaccine, vaccines given in Canada do not contain thimerosal, therefore parents should not be basing their decision on information that they find on thimerosal.

In terms of future studies, it would be interesting to know how the annual number of cases of vaccine-preventable diseases in Southern Health compares to the average number of cases in Manitoba per year. This data would indicate whether or not the herd immunity provided by vaccinated individuals in Southern Health is still strong enough to prevent epidemics of these diseases. If the rates of disease in Southern Health do not differ from those in Manitoba, then perhaps the lower immunization rate in the RHA is not an issue that needs to be aggressively addressed because it is not increasing unfavourable health risks.

## **CONCLUSION**

The data obtained from the survey and from the Panorama report from a public health nurse in Southern Health suggest that the immunization rates in Notre Dame de Lourdes are higher than the Southern Health average. The data from the survey also suggests that the immunization rates for patients attending the clinic in Notre Dame de Lourdes are higher than the Manitoba average. Most survey participants stated that they vaccinated their children to protect their children and others from preventable diseases. The one parent who stated that they did not vaccinate their children explained that they made this decision based on information they had found in their searches. It would be important to determine what sources of information are used by parents who choose not to vaccinate their children, so that the healthcare system can better address the reason for the parents' decision and better target these sources of information.

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