epiREPORT

Manitoba Health

Annual Immunization Surveillance Report, 2011

January 1 to December 31, 2011

Epidemiology & Surveillance
Public Health

Public Health and Primary Health Care Division

Manitoba

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Acknowledgments

The 2011 MIMS Annual Report is a result of the ongoing efforts of a dedicated team of individuals throughout the province of Manitoba including public health nurses, immunization coordinators, physicians and other primary health care providers. Their combined efforts and expertise in the area of immunization provide the data that is necessary to produce this valuable report.

What to Expect in This Report

The discerning reader will notice that the 2011 MIMS Report has a new format! Our goal is to provide data in a user-friendly manner that allows the reader to quickly access the required information. We have undertaken a comprehensive evaluation of the past report format and sought opinions from end users. In doing so, we hope that you will find the new report more efficient and enjoyable to learn from!

What you will see is that the new format:

- Includes graphs and figures to provide visual representations of data
- Highlights the recommended immunization schedules by age
- Details the recommended immunizations for each age by RHA
- Provides a tabular overview of all immunizations in the summary section of each chapter
- Highlights elements of the report in bright text boxes
- Contains supporting text to describe and summarize the data

The new report does not:

- Provide data by First Nation status. The level of accuracy in this self-reported variable is felt to be too low to provide consistent and reliable data for health care policy and planning purposes.
- Contain information on provider type, with the exception of the HPV and the Pneu-P-23 vaccine sections.

NOTE on Churchill: You might notice that Churchill`s rates seem exaggerated: either much higher or much lower than in other RHAs. This is a product of the region`s small population and should be kept in mind when making comparisons.

Let us know what you think. We appreciate your feedback! If you would like to comment on any aspect of the new report, both limitations and improvements, please send an email to:

outbreak@gov.mb.ca

Report Overview

Each chapter represents a specific age period that corresponds with the immunization schedule (ages 1, 2, 7, 11 and 17). Within each chapter, there are four sections that further describe immunizations from a provincial and regional perspective:

Section A: Immunizations in Manitoba

- Describes the key vaccines required to be complete for age.
- Contains an overall snapshot of immunizations in the province by age group.
- Provides an overview of the proportion of children vaccinated by RHA.
- Presents the immunization schedule containing the vaccines required to be complete for age.

Section B: Immunization Rates by RHA

- The proportion of children who are complete for age for particular vaccinations are summarized graphically. Only those vaccines required to be complete for age are detailed.

Complete for age is calculated by counting the number of doses of each immunogen given for each age group as shown below. For example, at age one, infants require three doses of tetanus and by age 17 they require six doses to be complete for age. If, at age 17, the count for an individual shows five doses, that individual would not be considered complete for age.

Doses Required to be Complete for Age by Immunogen, 2011

age	Tetanus	Diptheria	pertussis	Polio	Haemophilus influenza type b	Pneumococcal conjugate	Varicella	Measles	Mumps	Rubella	Human papillomavirus	Meningococcal conjugate C
1	3	3	3	2	3	3	0	0	0	0	0	0
2	4	4	4	3	4	4	1	1	1	1	0	1
7	5	5	5	4	4	0	1	2	1	1	0	0
11	5	5	5	4	0	0	0	2	1	1	3	1
17	6	6	6	4	0	0	0	2	1	1	3	0

Combined vaccines (e.g. DTap) are most frequently used to vaccinate children in Manitoba. In some instances the data shows that rates by immunogen vary slightly. This may be for reasons such as personal choice (e.g. a parent chooses not to vaccinate a child with a particular immunogen) or vaccine supply. For this reason, we have chosen to provide rates by immunogen.

Section C: Residency and Immunization Rates

- This section describes the different rates by comparing data on continuous residents to non-continuous residents. A **continuous resident** is defined as an individual with an uninterrupted registration with Manitoba Health from birth to December 31, 2011. A **non-continuous resident** has lived outside of Manitoba for a period of time, but was registered with Manitoba Health by December 31, 2011. Non-continuous residents may have been born in Manitoba but left for a period of time and then returned to Manitoba (see example 1), or they may have been born outside of the province and then moved to Manitoba (see example 2):

Example 1:

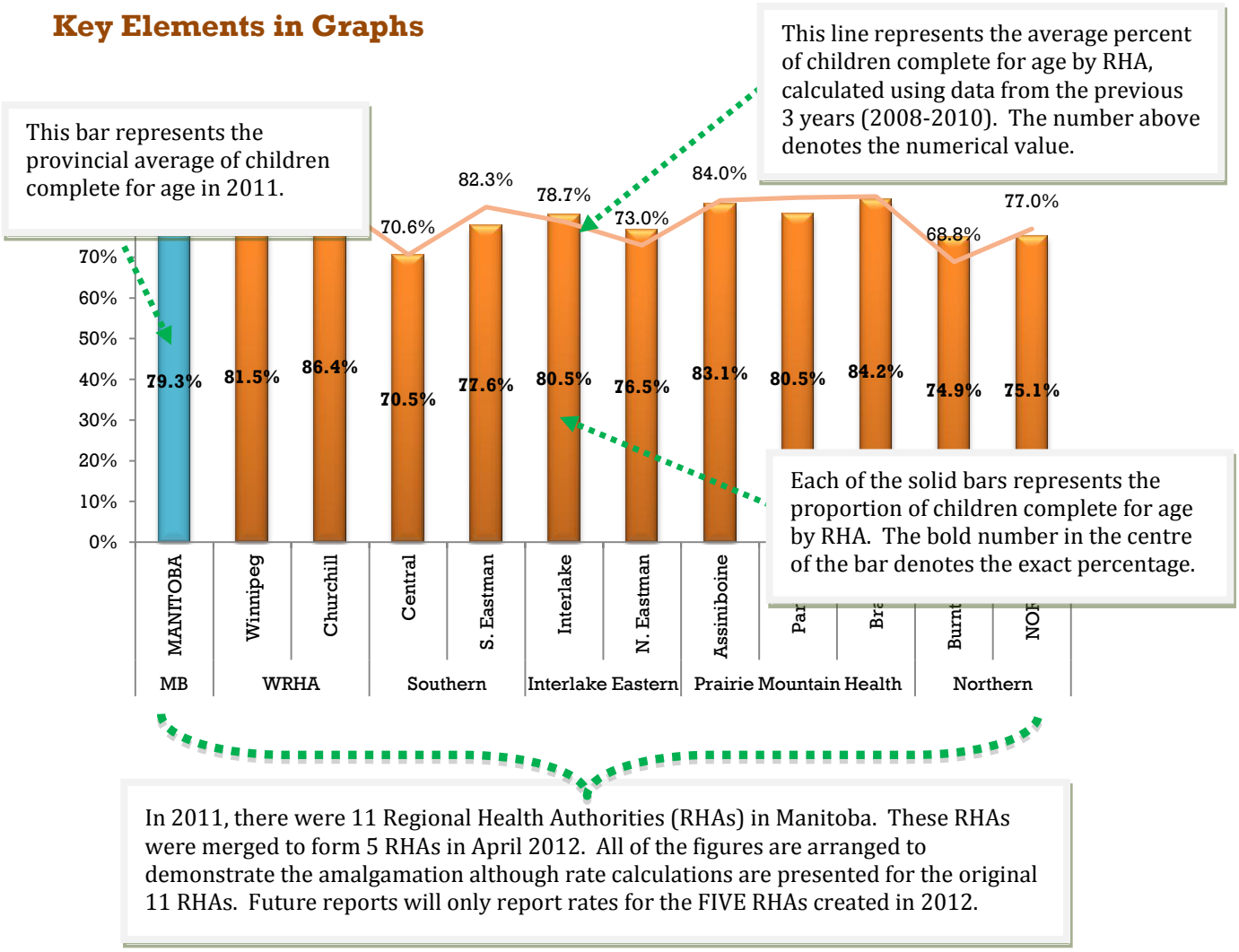
Example 2:

- MIMS is linked to the Insurance Registry at Manitoba Health. As such, MIMS is dependent on the presence of an active Personal Health Identification Number (PHIN) in order to collect immunization data. Residency impacts the interpretation of vaccination rates substantially and thus it is important to track and understand population trends.
- Some reasons for the variations in rates may include: 1) non-continuous residents are required to provide Manitoba Health with vaccination records upon re-entry to Manitoba. These records may be incomplete or unavailable; 2) the immunization schedules in other provinces or countries may be substantially different than in Manitoba; and 3) the vaccination records provided by non-continuous residents may not have been inputted into MIMS before the end of the year. Thus, it is likely that the rates for non-continuous residents are an underrepresentation of actual complete for age rates. However, without all the data available, a better estimate is not available.

Section D: Overview of all Immunization Rates by RHA

- The final section is a table containing all of the immunization rates for each vaccine by RHA.

Key Elements in Graphs



In 2011, there were 11 Regional Health Authorities (RHAs) in Manitoba. These RHAs were merged to form 5 RHAs in April 2012. All of the figures are arranged to demonstrate the amalgamation although rate calculations are presented for the original 11 RHAs. Future reports will only report rates for the FIVE RHAs created in 2012.

A note about antigens, immunogens and vaccines:

An antigen is any molecular agent that binds to components of the immune response (including lymphocytes and their receptors) antibodies and the t-cell receptor. An immunogen is any agent capable of inducing an immune response. Vaccines are dead or inactivated organisms or purified products derived from them. In this report we use vaccine names to describe the immunization schedule and in specific reference throughout the interpretation. Immunogens are more frequently used and describe single antigens.

The programming queries that produce the annual statistics use all of the current and historical immunogens that contribute to the immunization schedule. This means that in some instances, we are counting different immunogens because of product changes. For example, the Pneu-C-13 vaccine currently in use in Manitoba is the 13-valent product, which replaced the 7-valent product starting in July 2010. The 13-valent product is currently the only Pneu-C-13 vaccine used in Canada, but the 7-valent and potentially the 10-valent product is still used in some countries, so some non-continuous residents may have received it. A separate tariff code is assigned to each product to clinically identify the products, but both products are counted equally in complete for age calculations. A child would complete the series with either one product or the other, and is considered complete for age when the full series was given on schedule.

Immunizations at 1 Year

Section A: Immunizations in Manitoba

Table 1: Recommended Immunization Schedule- 1 Year

Vaccine	Age		
	2 months	4 months	6 months
DTaP-IPV-Hib Diphtheria, Tetanus, Pertussis, Polio, Haemophilus influenzae type b	♦	♦	♦
Pneu-C-13 ^ Pneumococcal Conjugate 13 valent	♦	♦	♦

♦ A single dose given with one needle.

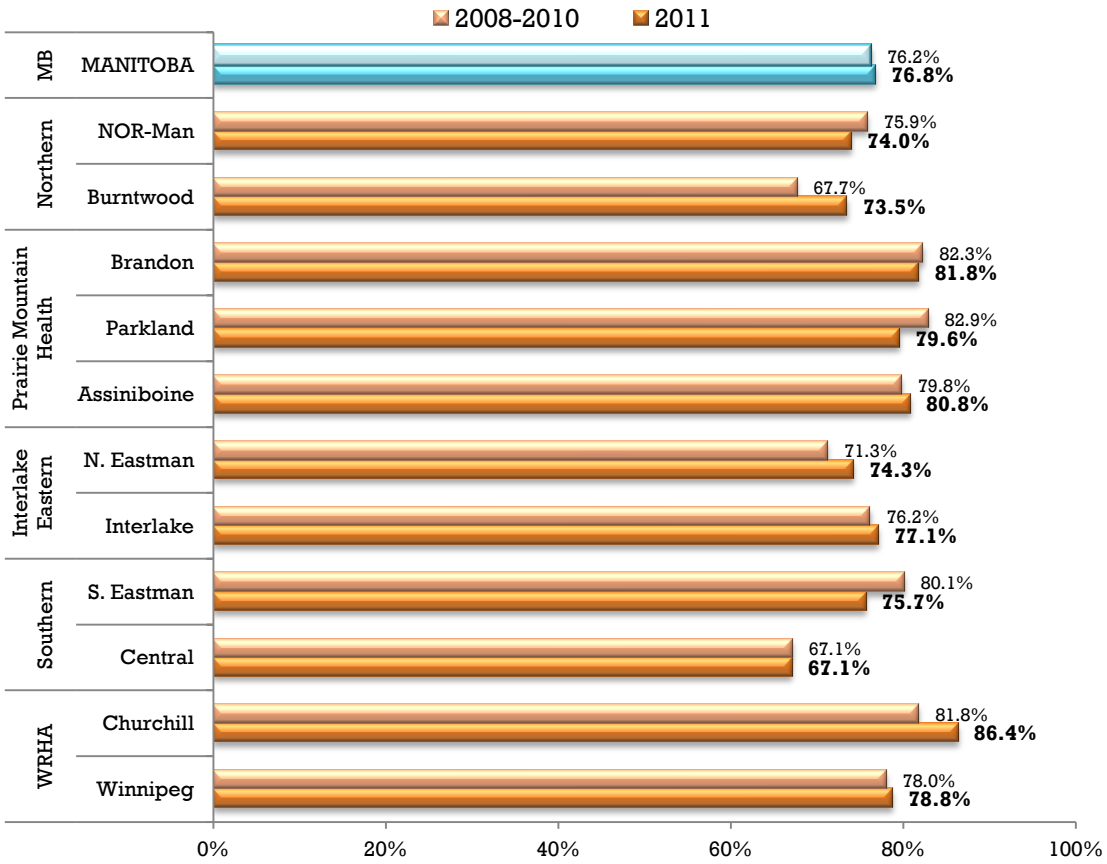
^ Children with high risk medical conditions and children of Aboriginal ancestry are recommended to follow a 4 dose schedule at 2, 4, 6 and 18 months. Children up to 59 months of age who received the Pneumococcal Conjugate 7 valent (PCV-7) immunization series are eligible to receive 1 dose of Pneu-C-13.

At age one, Manitoba's universal childhood immunization program provides protection against the following bacterial pathogens: diphtheria, tetanus, pertussis, *Haemophilus influenza* type b, and *streptococcus pneumoniae*. The age one program also provides protection against the viral infection polio. The immunization status of children at age one year represents those who were born in 2010 and who turned 1 year old in 2011. The data reported is for children who are complete for age: they have received all of their scheduled doses of vaccines within the recommended time periods as shown in Table 1. For an overview of immunogens required to be complete for age, refer to the table on page 7.

The measles, mumps, rubella immunizations, typically given as the combined MMR vaccine, is first given at age 12 months. It is not calculated in the one year old complete for age totals as a portion of children will receive it after their first birthday and will still be considered complete for age. Thus, the data on measles, mumps and rubella data is provided in the two year old section.

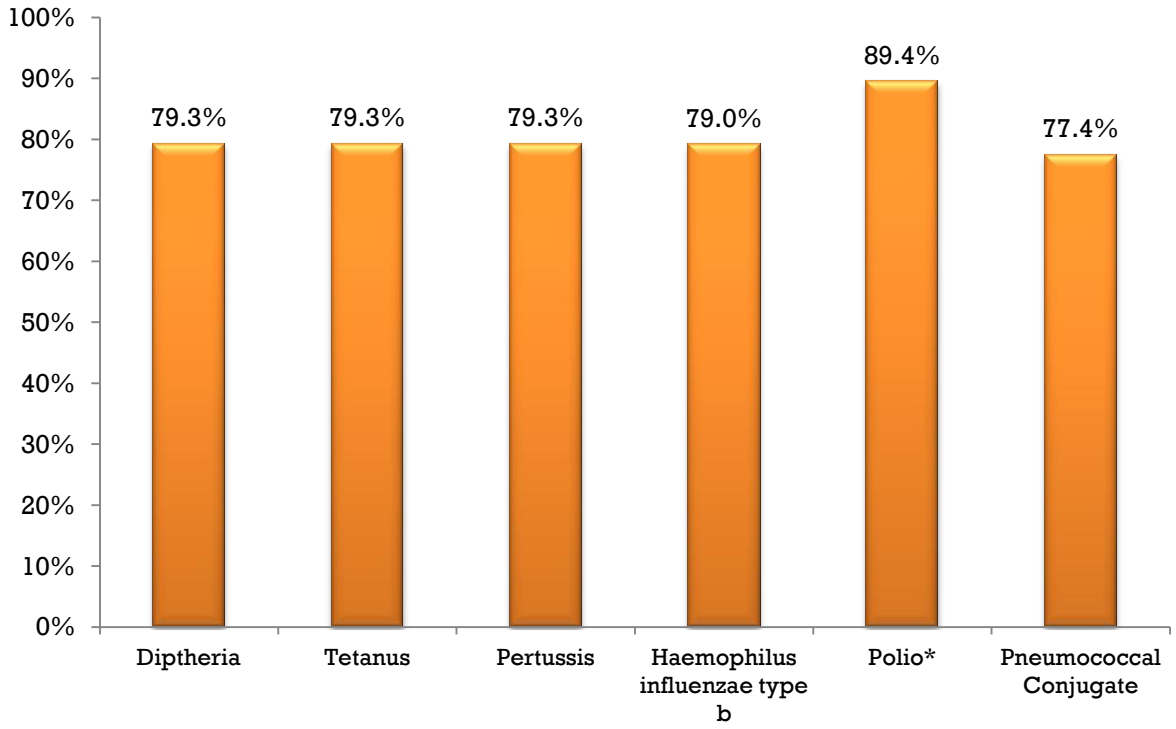
Manitoba Immunization Rates, Age 1

Figure 1: Percent of children who are complete from birth by RHA, 2011 & 3-year average of children who are complete from birth by RHA (2008-2010)



An average of 76.8 out of 100 one year olds in Manitoba received the vaccines available to them in 2011. This percentage is calculated with a denominator of all one year olds in Manitoba who have active Manitoba Health Personal Health Information Numbers (PHINs) (n=15,889), and a numerator containing all the children who received their required vaccinations (n=12,201). The overall average did vary by RHA: Churchill RHA had the highest percentage of one year old children vaccinated (86.4%) whereas Central RHA had the lowest (67.1%).

Figure 2: Manitoba Diphtheria, Tetanus Pertussis, *Haemophilus influenza* type B (Hib), Polio, and Pneumococcal Conjugate (Pneu-C-13) Immunization Rates, Age 1
Percent of children who are complete from birth, 2011



* Children require 2 doses of Polio. As they typically receive 3 boosters given as a combined product the uptake rate is higher than the other immunogens contained in the combined vaccine.

In their first year, children can receive a combined vaccine which offers protection against diphtheria, tetanus, pertussis, *Haemophilus influenza* type b, and polio referred to as the DTaP-Hib. Three doses are required, at ages 2, 4 and 6 months, to be considered complete for age for diphtheria, tetanus, pertussis and Hib. However, children only require two doses of the polio vaccine to be complete for age, and the immunization rates can be different for polio than for the other immunogens. For example, if a child missed one booster and therefore only had two doses of DTaP-IPV-Hib, s/he would not be considered complete for age for diphtheria, tetanus, pertussis, or haemophilus, but would be complete for age for polio. Polio vaccination rates are typically higher for this reason.

On average, 76.8% of 1 year olds in Manitoba received the recommended series of vaccinations in 2011.

Section B: Immunization Rates by RHA- 1 Year

Figure 3: RHA Diphtheria Immunization Rates, Age 1
Percentage of children who are complete for age for Diptheria, 2011

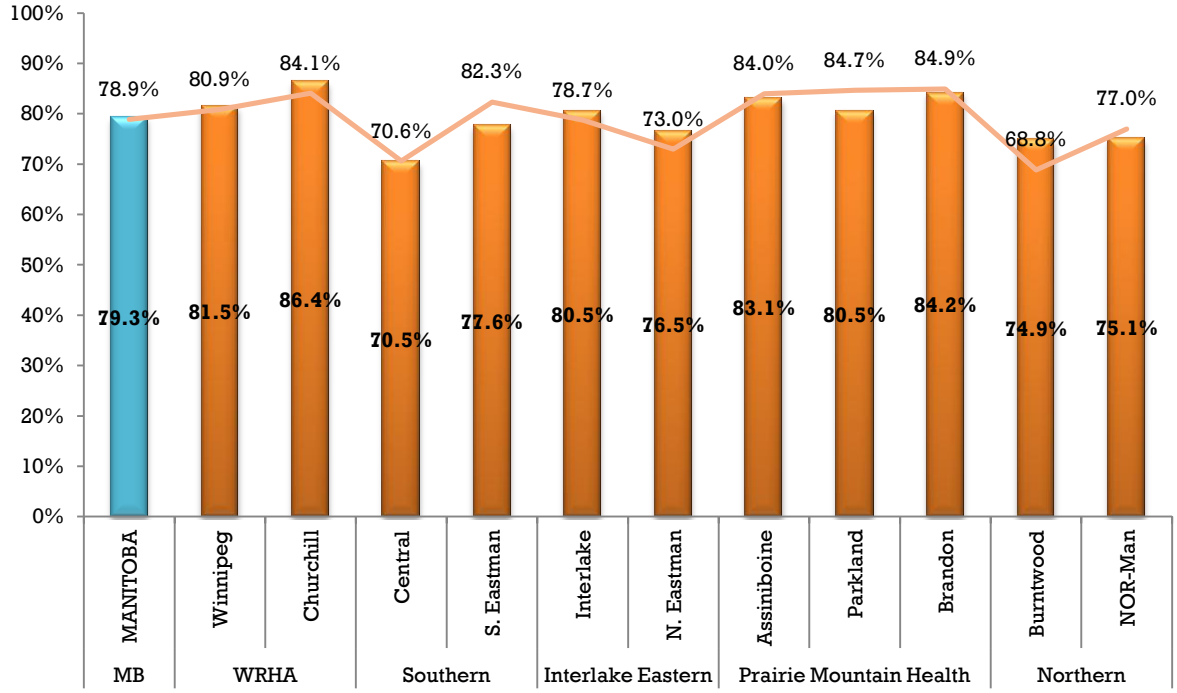


Figure 4: RHA Tetanus Immunization Rates, Age 1
Percentage of children who are complete for age for Tetanus, 2011

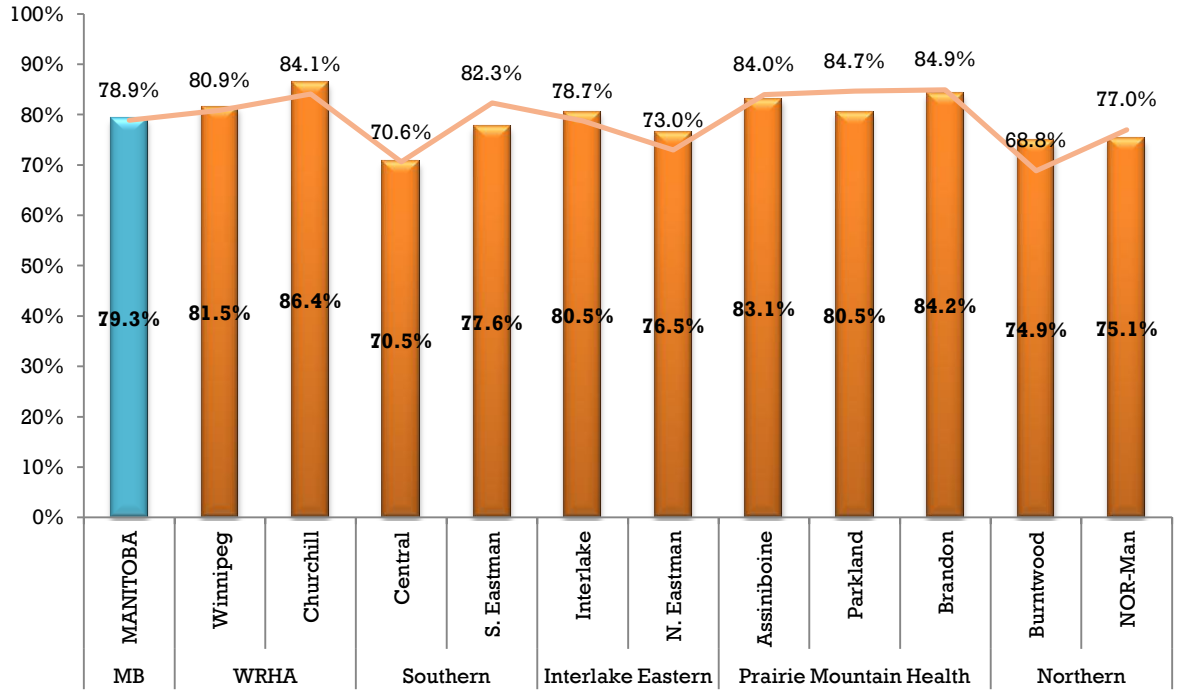


Figure 5: RHA Pertussis Immunization Rates, Age 1

Percentage of children who are complete for age for Pertussis, 2011

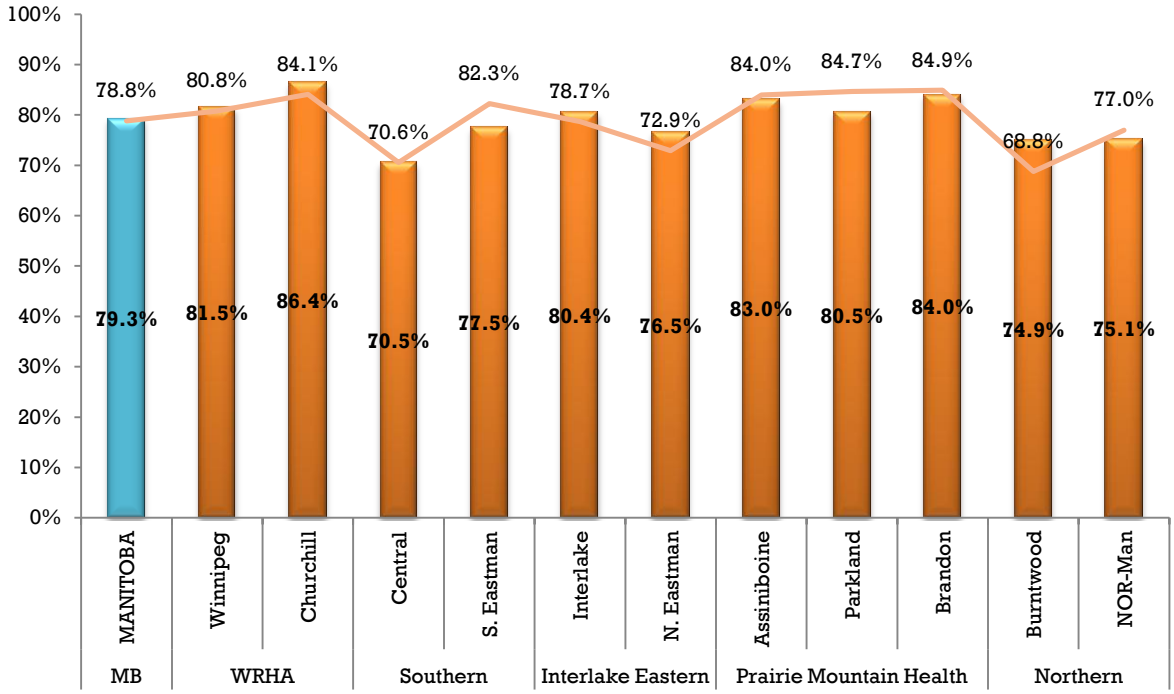
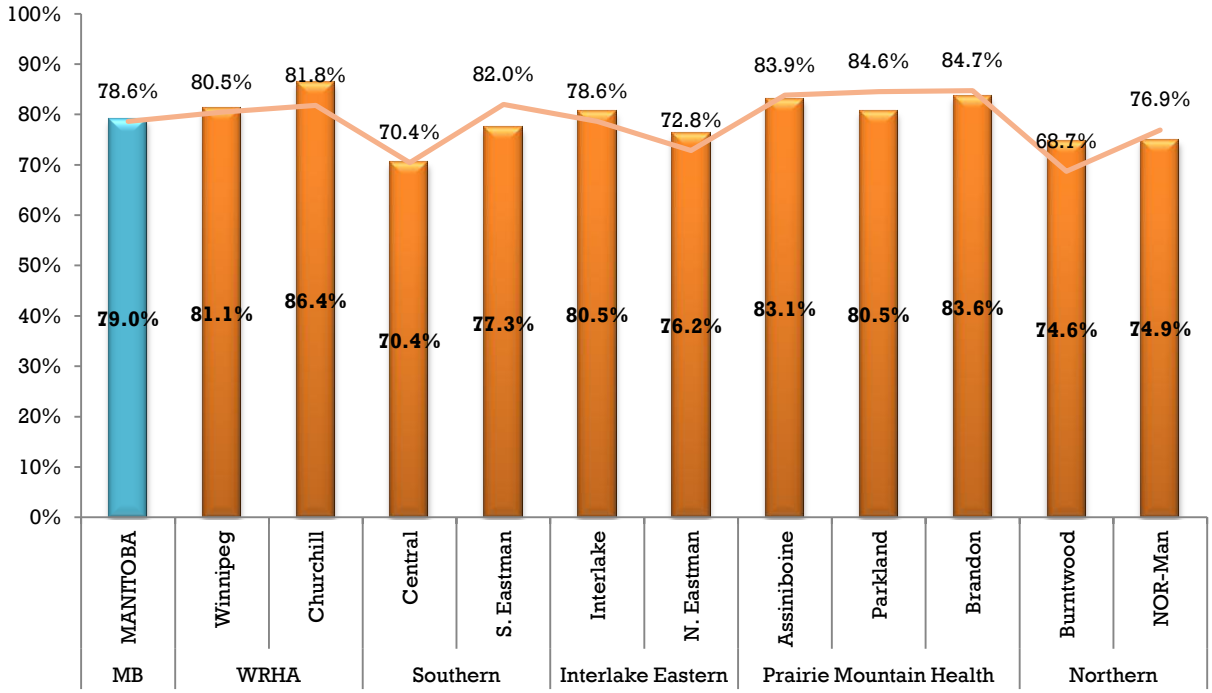


Figure 6: RHA *Haemophilus influenza* type B Immunization Rates, Age 1

Percentage of children who are complete for age for Haemophilus influenza type B, 2011

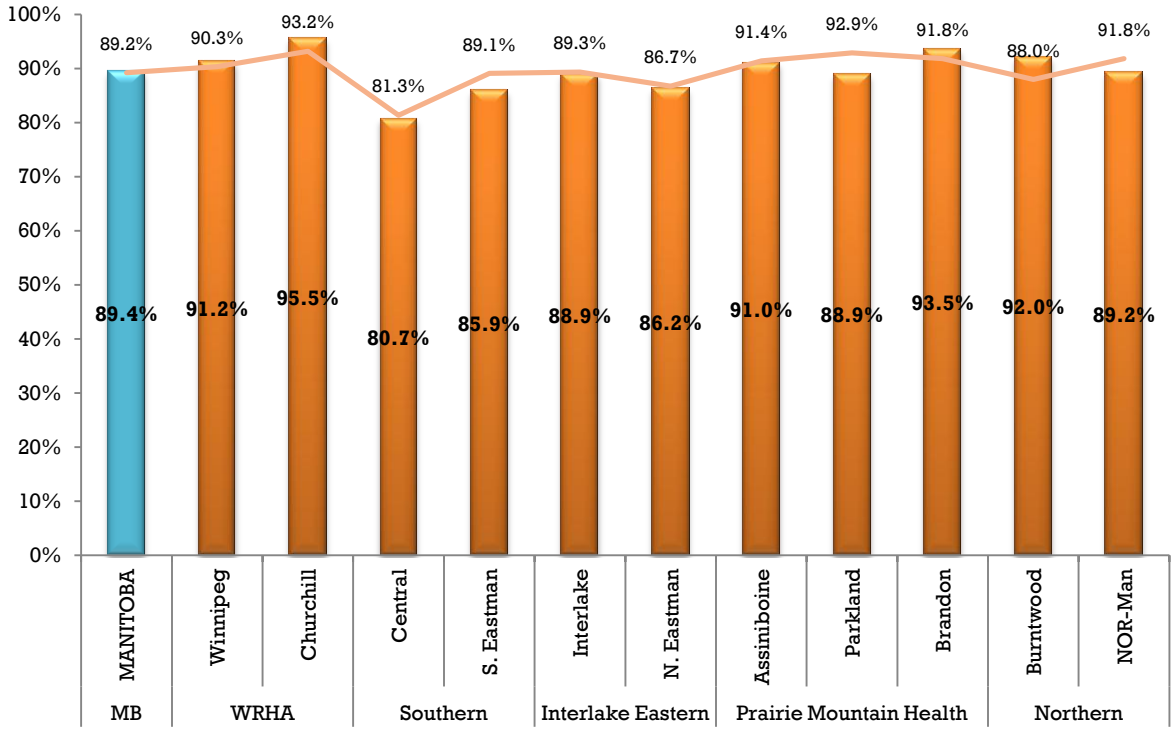


The percentages of children receiving the diptheria, tetanus, pertussis, and *Haemophilus influenza* type b immunogens were very similar. This is because the vaccine is most commonly given in combination (DTap-Hib).

Approximately 8 in 10 one year olds received the diptheria, tetanus, pertussis and Haemophilus influenza type b immunogens in 2011.

Polio

Figure 7: RHA Polio (IPV) Immunization Rates, Age 1
Percentage of children who are complete for age for IPV, 2011

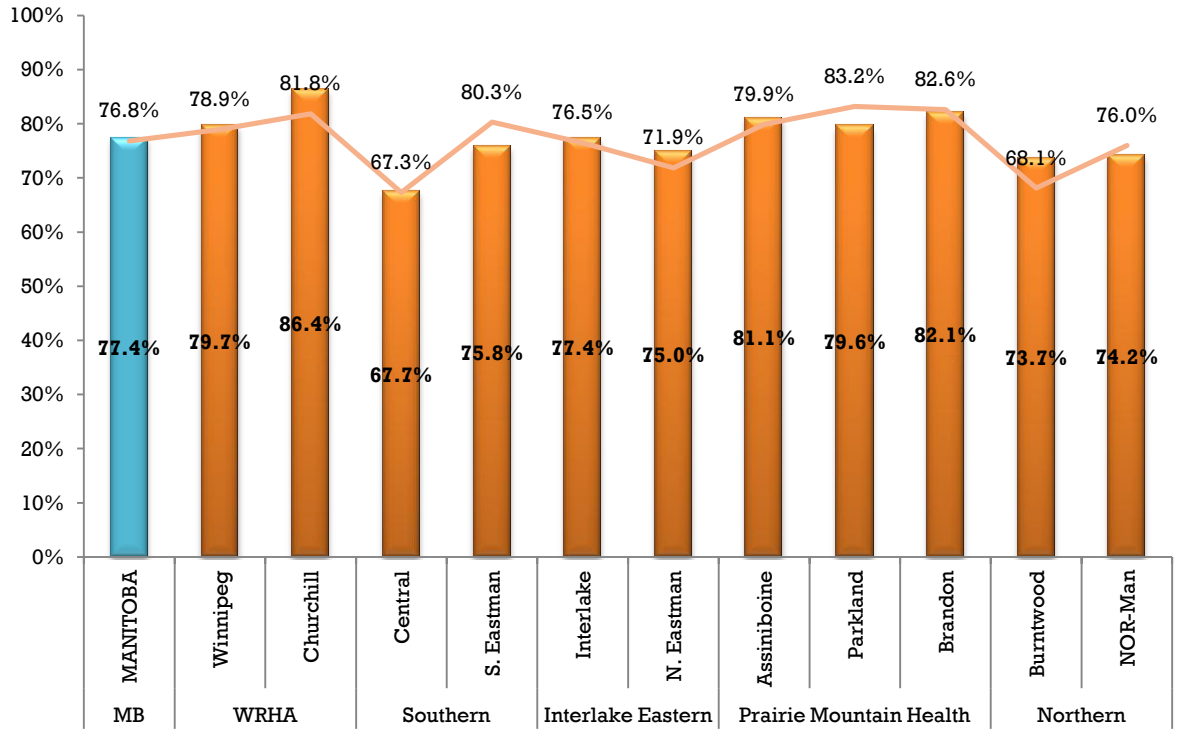


Across the province, roughly nine out of ten infants (89.4%) received the required dosage of the polio vaccine.

Immunization rates for polio are quite high overall. The rates range from 80.7% (Central) to 93.2% (Churchill). The three-year averages appear to be consistent by RHA with little variation evident within the regions. This consistency is important to evaluate by looking at what contributes to consistency and if changes could produce even higher rates.

Pneumococcal Conjugate Vaccine (Pneu-C-13)

Figure 8: RHA Pneumococcal Conjugate Vaccine (Pneu-C-13) Immunization Rates, Age 1
Percentage of children who are complete for age for Pneu-C-13, 2011

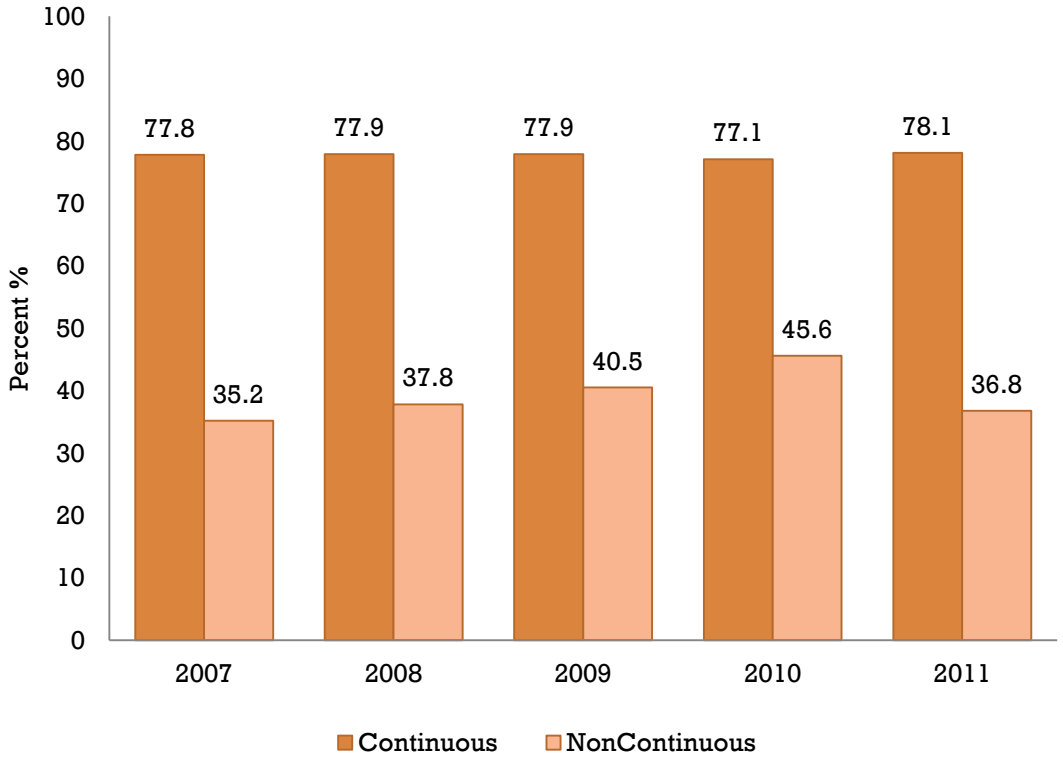


The pneumococcal conjugate (Pneu-C-13) vaccine is administered to children aged two, four, six and 18 months. Across the province, approximately eight in ten infants (77.4%) met the requirements to be considered complete for age for the Pneu-C-13 vaccine. This is slightly higher than the previous three years, where the average from 2008-2010 was 76.8%. Seven of the RHAs (Winnipeg, Churchill, South Eastman, Central, Interlake, North Eastman, and Burntwood) had higher rates in 2011 when comparing rates to the average of the previous three years. There is noticeable variation between Regional Health Authorities: in 2011, Churchill had the highest rate of complete for age children at 86.4% whereas Central RHA was the lowest at 67.7%. Over the previous three years (from 2008-2010), the average RHA rates have ranged from 67.3% (Central) to 82.6% (Brandon).

Section C: Residency and Immunization Rates

Continuous vs. Non-continuous Residency at Age 1

Figure 9: Percentage of Children Complete for Age at 1 Year by Continuous and Non-Continuous Resident Status (2007-2011), Age 1



The percentages of one year olds considered complete for age is substantially higher for continuous residents in comparison to non-continuous residents.

From 2007-2011, approximately three quarters of continuous residents were complete for age at one year compared to approximately one-third of non-continuous residents. Additional explanations on the reasons for these differences in rates can be found on page 8.

Section D: Overview of all Immunization Rates by RHA- 1 Year

Table 2: Percentages and Three Year Averages (2008-2010) for Immunogens

AGE 1	MB	WRHA		Southern		Interlake Eastern		Prairie Mountain			Northern	
	MANITOBA	Winnipeg	Churchill	Central	S. Eastman	Interlake	N. Eastman	Assiniboine	Parkland	Brandon	Burntwood	NOR-Man
Population	**15889**	**7898**	**22**	**1691**	**1148**	**827**	**567**	**840**	**514**	**682**	**1254**	**446**
Diptheria	**12597**	**6434**	**19**	**1193**	**891**	**666**	**434**	**698**	**414**	**574**	**939**	**335**
2011	79.3%	81.5%	86.4%	70.5%	77.6%	80.5%	76.5%	83.1%	80.5%	84.2%	74.9%	75.1%
2008-2010	*78.9%*	*80.9%*	*84.1%*	*70.6%*	*82.3%*	*78.7%*	*73.0%*	*84.0%*	*84.7%*	*84.9%*	*68.8%*	*77.0%*
Tetanus	**12597**	**6434**	**19**	**1193**	**891**	**666**	**434**	**698**	**414**	**574**	**939**	**335**
2011	79.3%	81.5%	86.4%	70.5%	77.6%	80.5%	76.5%	83.1%	80.5%	84.2%	74.9%	75.1%
2008-2010	*78.9%*	*80.9%*	*84.1%*	*70.6%*	*82.3%*	*78.7%*	*73.0%*	*84.0%*	*84.7%*	*84.9%*	*68.8%*	*77.0%*
Pertussis	**12593**	**6434**	**19**	**1193**	**890**	**665**	**434**	**697**	**414**	**573**	**939**	**335**
2011	79.3%	81.5%	86.4%	70.5%	77.5%	80.4%	76.5%	83.0%	80.5%	84.0%	74.9%	75.1%
2008-2010	*78.8%*	*80.8%*	*84.1%*	*70.6%*	*82.3%*	*78.7%*	*72.9%*	*84.0%*	*84.7%*	*84.9%*	*68.8%*	*77.0%*
Hib	**12553**	**6406**	**19**	**1191**	**887**	**666**	**432**	**698**	**414**	**570**	**936**	**334**
2011	79.0%	81.1%	86.4%	70.4%	77.3%	80.5%	76.2%	83.1%	80.5%	83.6%	74.6%	74.9%
2008-2010	*78.6%*	*80.5%*	*81.8%*	*70.4%*	*82.0%*	*78.6%*	*72.8%*	*83.9%*	*84.6%*	*84.7%*	*68.7%*	*76.9%*
Polio	**14209**	**7203**	**21**	**1364**	**986**	**735**	**489**	**764**	**457**	**638**	**1154**	**398**
2011	89.4%	91.2%	95.5%	80.7%	85.9%	88.9%	86.2%	91.0%	88.9%	93.5%	92.0%	89.2%
2008-2010	*89.2%*	*90.3%*	*93.2%*	*81.3%*	*89.1%*	*89.3%*	*86.7%*	*91.4%*	*92.9%*	*91.8%*	*88.0%*	*91.8%*
PCV	**12294**	**6291**	**19**	**1144**	**870**	**640**	**425**	**681**	**409**	**560**	**924**	**331**
2011	77.4%	79.7%	86.4%	67.7%	75.8%	77.4%	75.0%	81.1%	79.6%	82.1%	73.7%	74.2%
2008-2010	*76.8%*	*78.9%*	*81.8%*	*67.3%*	*80.3%*	*76.5%*	*71.9%*	*79.9%*	*83.2%*	*82.6%*	*68.1%*	*76.0%*
Measles	**438**	**259**	**0**	**19**	**26**	**23**	**25**	**12**	**11**	**22**	**32**	**9**
2011	2.8%	3.3%	0.0%	1.1%	2.3%	2.8%	4.4%	1.4%	2.1%	3.2%	2.6%	2.0%
2008-2010	*2.4%*	*2.7%*	*0.0%*	*1.5%*	*1.8%*	*2.1%*	*3.0%*	*1.5%*	*1.6%*	*3.4%*	*2.5%*	*2.6%*
Mumps	**411**	**238**	**0**	**19**	**26**	**23**	**25**	**12**	**11**	**20**	**28**	**9**
2011	2.6%	3.0%	0.0%	1.1%	2.3%	2.8%	4.4%	1.4%	2.1%	2.9%	2.2%	2.0%
2008-2010	*2.3%*	*2.6%*	*0.0%*	*1.5%*	*1.7%*	*2.1%*	*3.0%*	*1.5%*	*1.5%*	*3.3%*	*2.4%*	*2.6%*
Rubella	**414**	**241**	**0**	**19**	**26**	**23**	**25**	**12**	**11**	**20**	**28**	**9**
2011	2.6%	3.1%	0.0%	1.1%	2.3%	2.8%	4.4%	1.4%	2.1%	2.9%	2.2%	2.0%
2008-2010	*2.3%*	*2.6%*	*0.0%*	*1.5%*	*1.7%*	*2.1%*	*3.0%*	*1.5%*	*1.5%*	*3.4%*	*2.4%*	*2.6%*
Varicella	**308**	**169**	**0**	**13**	**21**	**16**	**21**	**8**	**13**	**12**	**27**	**8**
2011	1.9%	2.1%	0.0%	0.8%	1.8%	1.9%	3.7%	1.0%	2.5%	1.8%	2.2%	1.8%
2008-2010	*2.1%*	*2.4%*	*0.0%*	*1.3%*	*1.3%*	*1.8%*	*2.6%*	*1.1%*	*1.4%*	*2.8%*	*2.1%*	*2.1%*
Men C-C	**402**	**207**	**0**	**25**	**26**	**25**	**20**	**19**	**19**	**19**	**30**	**12**
2011	2.5%	2.6%	0.0%	1.5%	2.3%	3.0%	3.5%	2.3%	3.7%	2.8%	2.4%	2.7%
2008-2010	*2.6%*	*3.2%*	*0.0%*	*1.4%*	*2.7%*	*2.1%*	*2.5%*	*1.9%*	*2.4%*	*3.1%*	*1.3%*	*1.6%*

Immunizations at 2 Years

Section A: Immunizations in Manitoba

Table 3: Recommended Immunization Schedule- 2 Years

Vaccine	Age	
	12 months	18 months
DTaP-IPV-Hib Diphtheria, Tetanus, Pertussis, Polio, Haemophilus influenzae type b		♦
Pneu-C-13 Pneumococcal Conjugate 13 valent		♦
MMR Measles, Mumps, Rubella,	♦	
V Varicella	♦	
Men-C-C Meningococcal C Conjugate	♦	

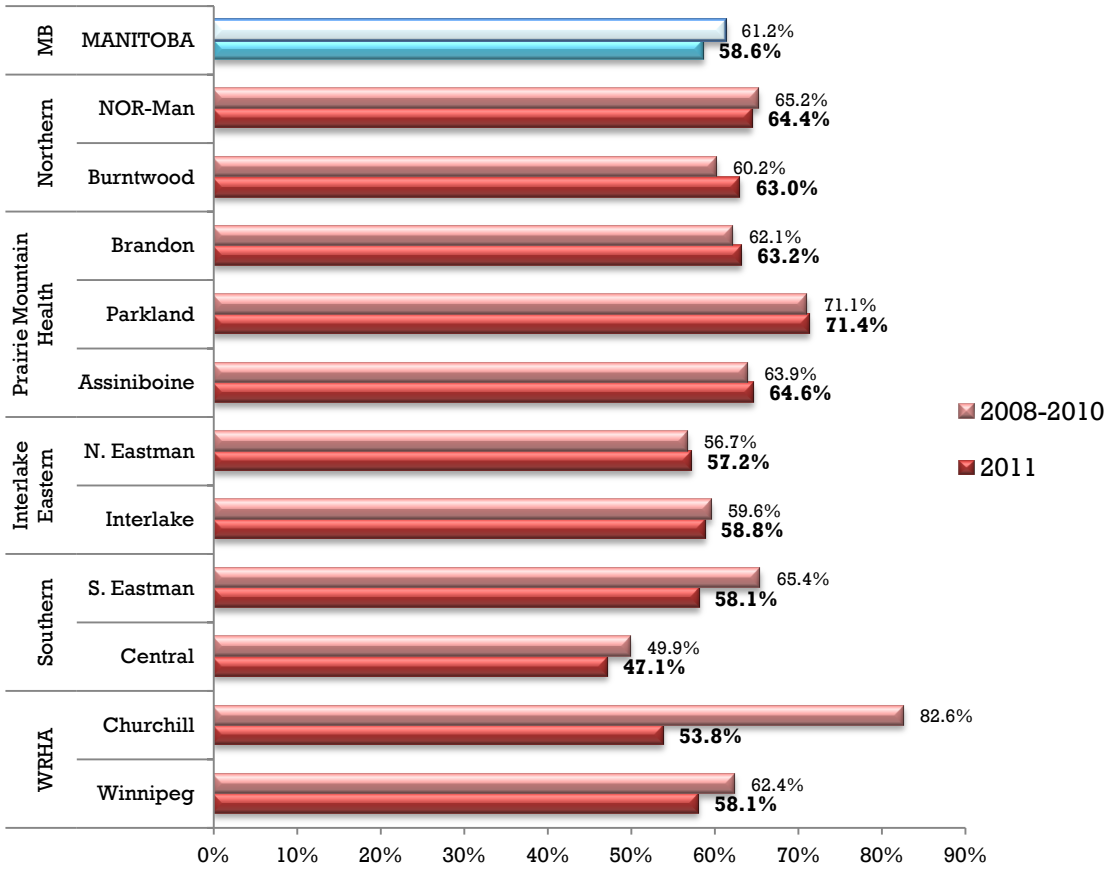
♦ A single dose given with one needle.

At age two, Manitoba's universal childhood immunization program boosts protection against the following bacterial pathogens: diphtheria, tetanus, pertussis, *Haemophilus influenza* type b, and *streptococcus pneumoniae* (with the polyvalent conjugate vaccine (PCV-7 or 13)). The age two program also provides protection against the following viral infections: measles, mumps, rubella, varicella and polio. The immunization status of children at age two represents those who were born in 2009 and who turned 2 years old in 2011. The data reported is for children who have received all of their scheduled doses of vaccines within the recommended time periods as shown in Table 2.

The Meningococcal Conjugate C (Men-C-C) vaccine was introduced on January 1, 2009, to be given to children at least 12 months old who were born after January 1, 2008. One year old children in the 2011 cohort would be receiving this vaccine at 12 months as part of their primary series however it is not counted in the complete for age requirements until age 2.

Manitoba Immunization Rates, Age 2

Figure 10: Percent of children who are complete from birth by RHA, 2011 & 3-year average of children who are complete from birth by RHA (2008-2010)

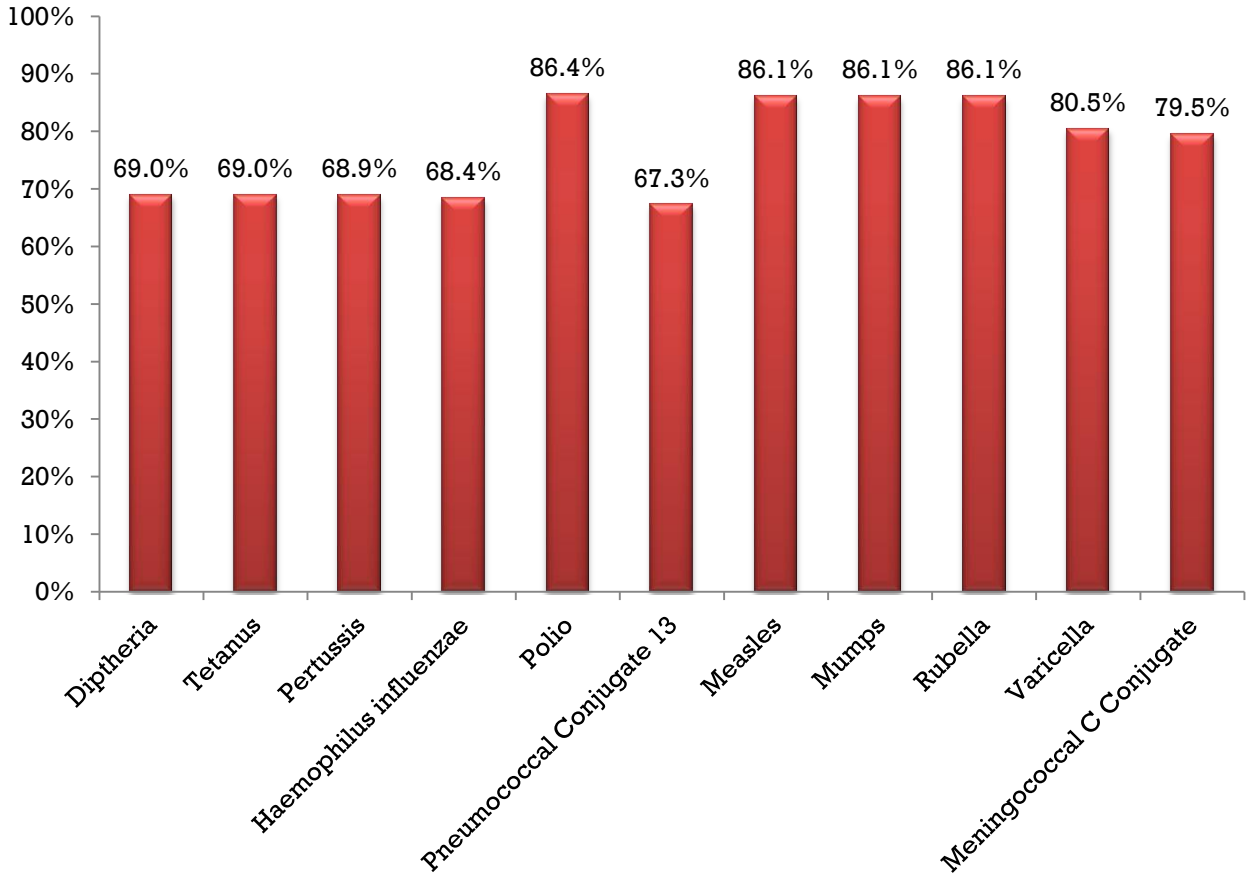


In Manitoba, an average of 58.6 out of 100 two year olds had received the vaccines available to them.

This percentage is calculated with a denominator of all two year olds in Manitoba (n=16,384) and a numerator containing all the children who had received their required vaccinations (n=9,599). The overall average did vary by RHA: Parkland RHA had the highest percentage of children vaccinated (71.4%) whereas Central RHA had the lowest (47.1%). The large difference between the three year average and the 2011 rate seen in the Churchill RHA are a reflection of the small sample size.

Figure 11: Manitoba Diphtheria (D), Tetanus (T), Pertussis (aP), *Haemophilus influenza* type B (Hib), Polio (IPV), Pneumococcal Conjugate (Pneu-C-13), Measles, Mumps, Rubella, Varicella, and Meningococcal C Conjugate (Men-C-C) Immunization Rates, Age 2

Percent of children who are complete from birth for the Diphtheria, Tetanus, Pertussis, Haemophilus influenza type B, Polio, Pneumococcal Conjugate, Measles, Mumps, Rubella, Varicella, and Meningococcal C Conjugate, 2011



About two-thirds of Manitoba's two year olds received boosters addressing diptheria, tetanus, pertussis, HiB, and Pneu-13. About eight in ten children had received the Men-C-C and varicella vaccines. Almost nine out of ten two-year olds were complete for age for polio, measles, mumps and rubella.

Section B: Immunization Rates by RHA- 2 Year

Figure 12: Diphtheria (D) Immunization Rates by RHA, Age 2
Percentage of children who are complete for age for Diptheria, 2011

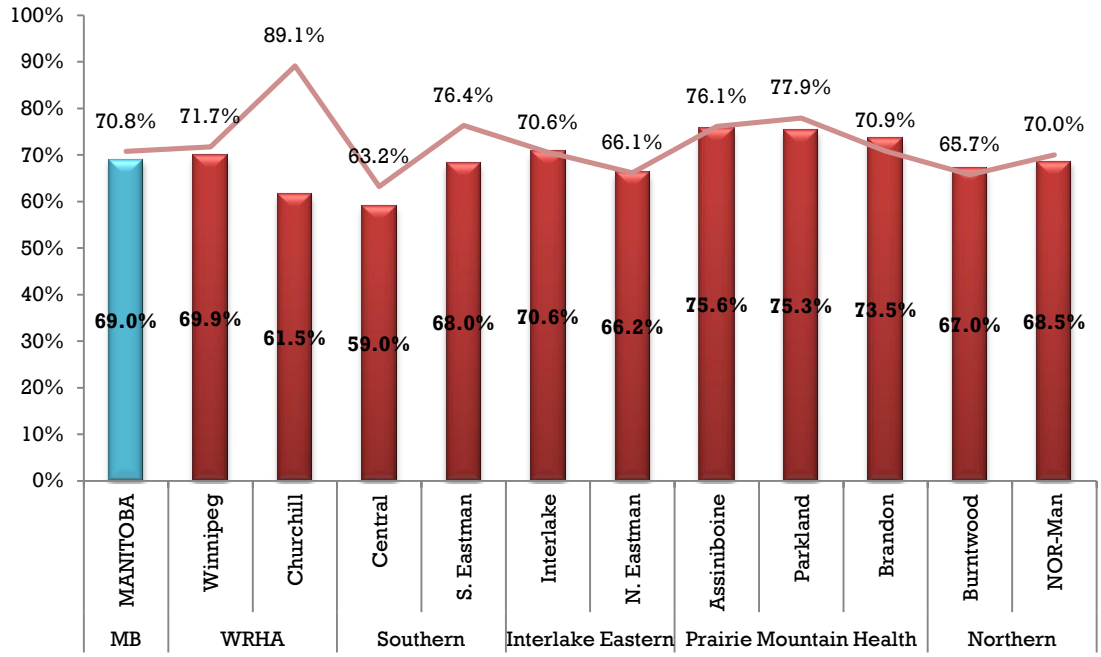


Figure 13: Tetanus Immunization Rates by RHA, Age 2
Percentage of children who are complete for age for Tetanus, 2011

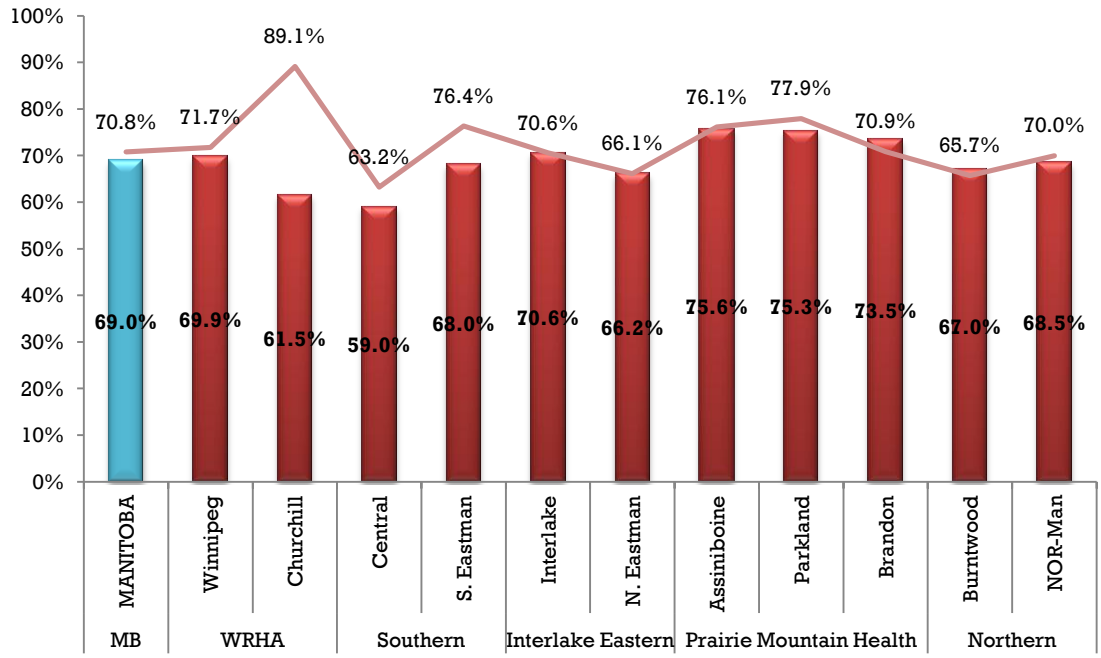


Figure 14: Pertussis (P) Immunization Rates by RHA, Age 2
Percentage of children who are complete for age for Pertussis, 2011

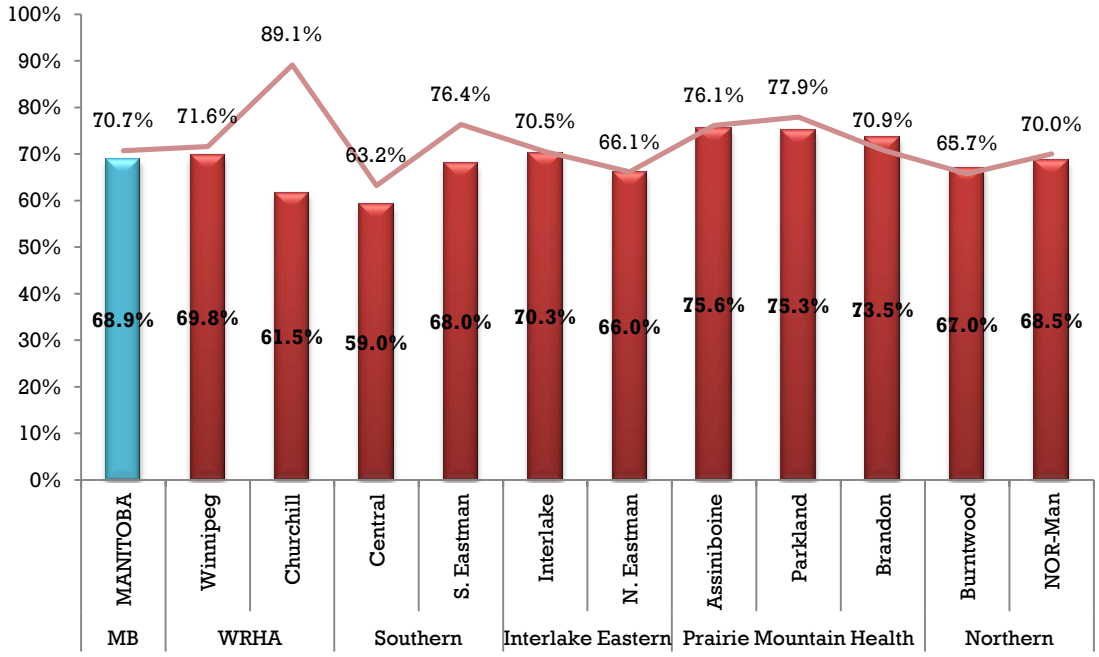
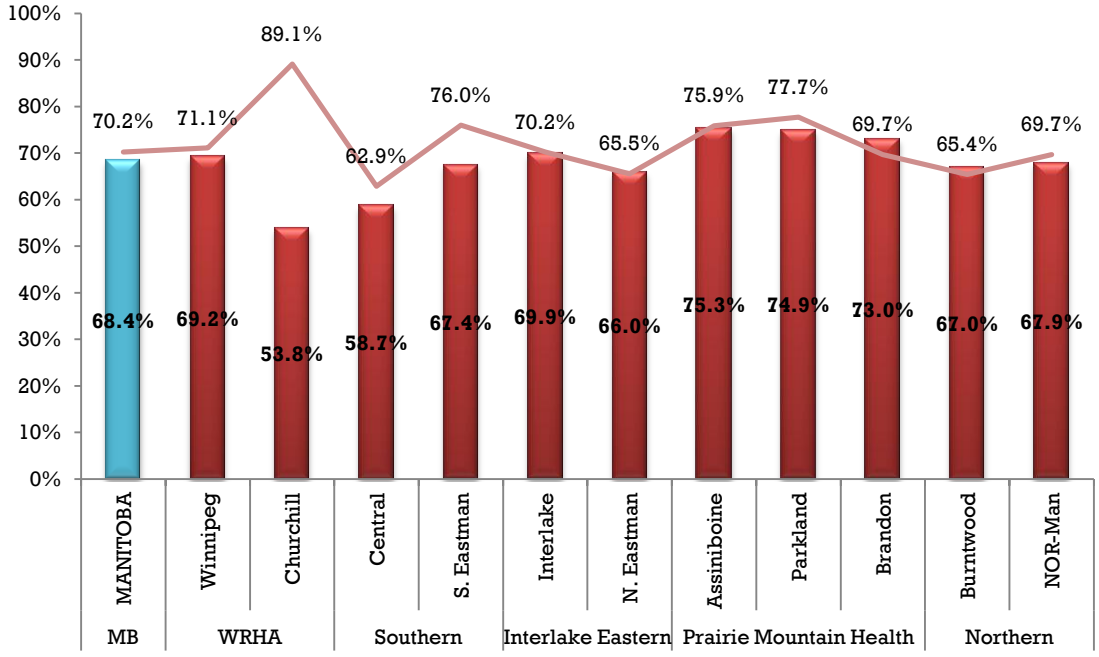


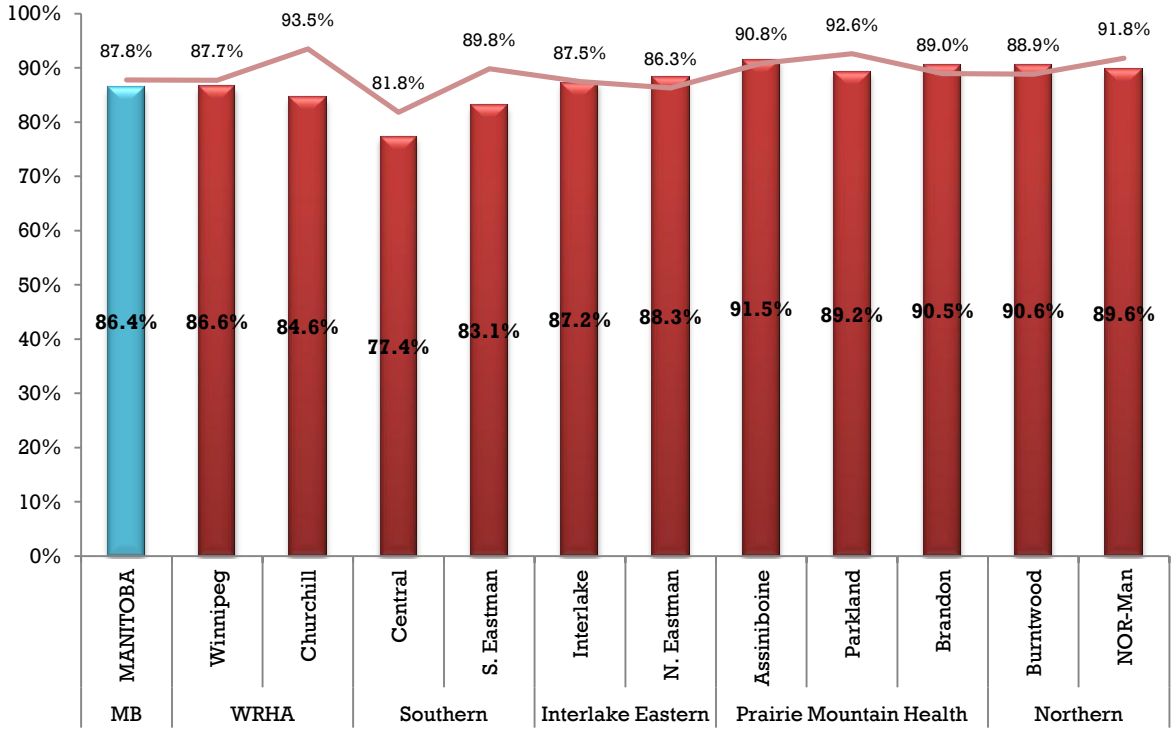
Figure 15: *Haemophilus influenza* type b (Hib) Immunization Rates by RHA, Age 2
Percentage of children who are complete for age for Hib, 2011



By the end of their second year, children who are complete for age have received four doses of diphtheria, tetanus, acellular pertussis, and *Haemophilus influenza* type b, typically given in a combined vaccine at 2, 4, 6 and 18 months. The average rate for two year olds is fairly consistent over time and hovers around the 70% mark. As vaccines are typically given in a combined vaccine, the immunogen rates are very similar by RHA. Across the province, Central RHA had the lowest immunization rates and Parkland had the highest. Churchill's 2011 rate seems significantly lower than its three year average which is simply a reflection of the small sample of two year olds in that region (N=13).

Polio (IPV)

Figure 16: RHA Polio (IPV) Immunization Rates, Age 2
Percentage of children who are complete for age for IPV, 2011



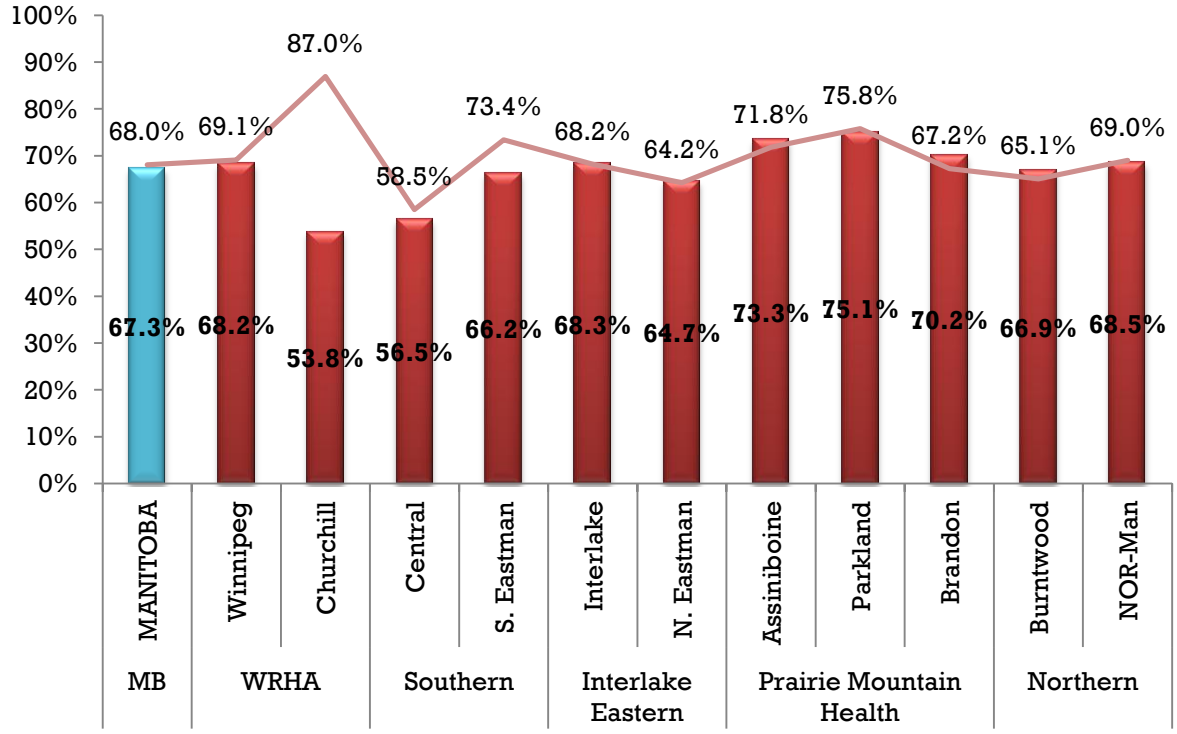
The polio vaccination series is complete at 18 months when a total of three doses are given at 2, 4 and 18 months. The polio immunogen is typically administered as part of a combined vaccine that includes diphtheria, pertussis, and haemophilus influenza type b (DTaP-IPV-Hib), and the combined vaccine is given in four doses, at 2, 4, 6 and 18 months. Therefore, the uptake rate for polio vaccine is typically higher than the other immunogens contained in the combined vaccine as some children may not have received all four booster doses.

Across the province, roughly nine out of ten two-year olds (86.4%) received the required vaccines to be considered complete for age for the polio vaccine. Although 2011's provincial rate is slightly lower than the three-year average, the rates are consistent over time.

The rates vary when comparing the RHAs. For example, in 2011, three RHAs had completion rates over 90% (Assiniboine, Parkland and Nor-Man). Although these rates are slightly lower when comparing the immunization rates of the 1 year olds, they are still considered strong.

Pneumococcal Conjugate Vaccine (Pneu-C-13)

Figure 17: RHA Pneumococcal Conjugate Vaccine (Pneu-C-13) Immunization Rates, Age 2
Percentage of children who are complete for age for Pneu-C-13, 2011



The pneumococcal conjugate (Pneu-C-13) vaccine is administered to children at their 2, 4, 6 and 12 month visits. At age one, about eight in ten infants (77.4%) received the necessary two doses to be complete for age. By age two, there is a ten percent decrease in the average number of children complete for age. For two year olds across the province, almost seven in ten children (67.3%) have completed the schedule. There continues to be variation between regional health authorities; in 2011, three RHAs (Brandon, Assiniboine and Parkland) achieved rates over 70%. Church RHA was the lowest at 53.8%.

At age <u>one</u>, approximately eight in ten infants (77.4%) received the necessary two doses of Pneu-C-13 to be considered complete for age. By age <u>two</u>, there is a ten percent *decrease* in the average number of children complete for age; only about seven in ten children (67.3%) are considered complete for age for the Pneu-C-13 vaccine.

Measles, Mumps, Rubella and Varicella

Figure 18: RHA Measles Immunization Rates, Age 2
Percentage of children who are complete for age for Measles, 2011

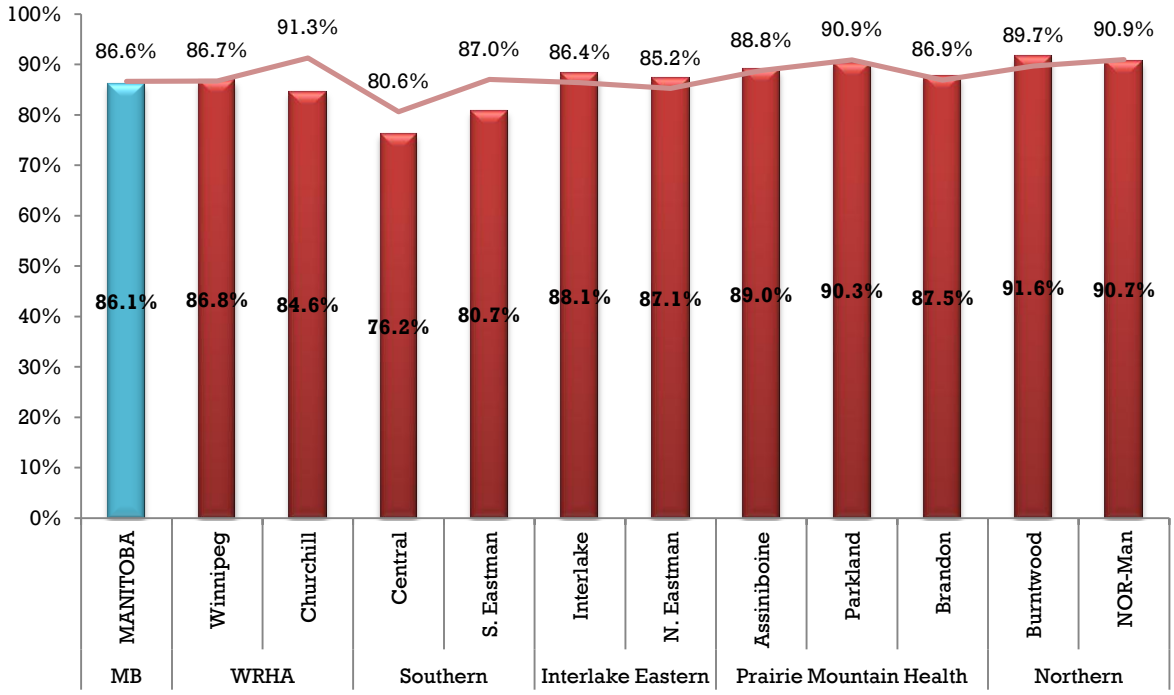


Figure 19: RHA Mumps Immunization Rates, Age 2
Percentage of children who are complete for age for Mumps, 2011

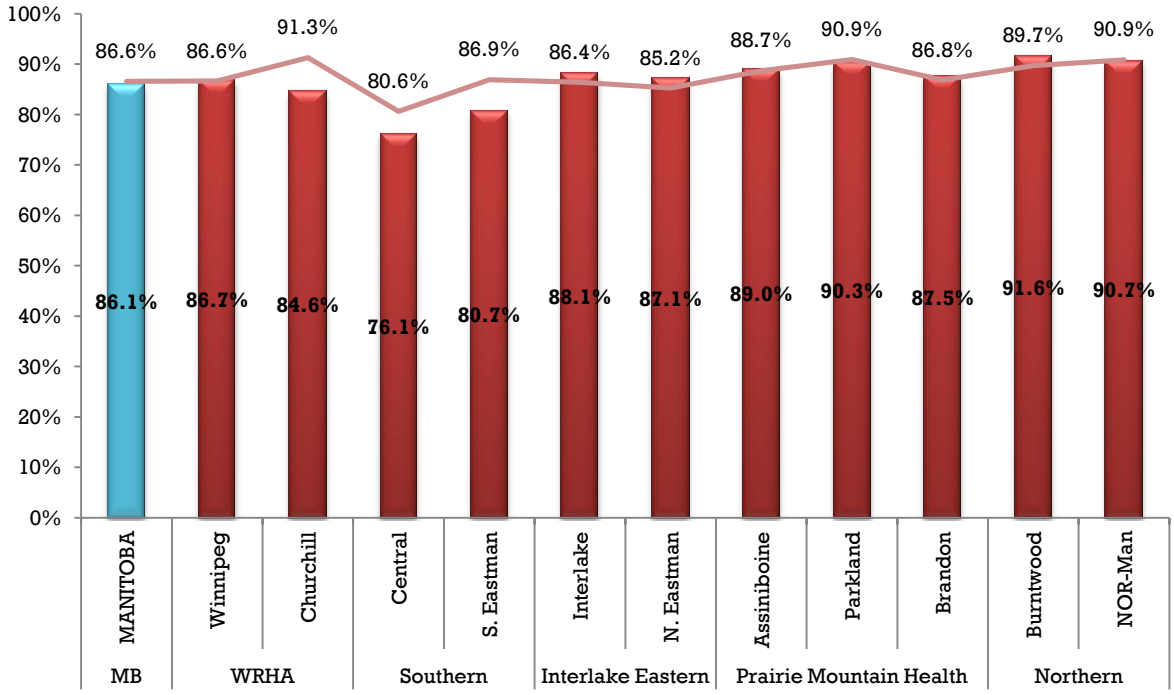


Figure 20: RHA Rubella Immunization Rates, Age 2

Percentage of children who are complete for age for Rubella, 2011

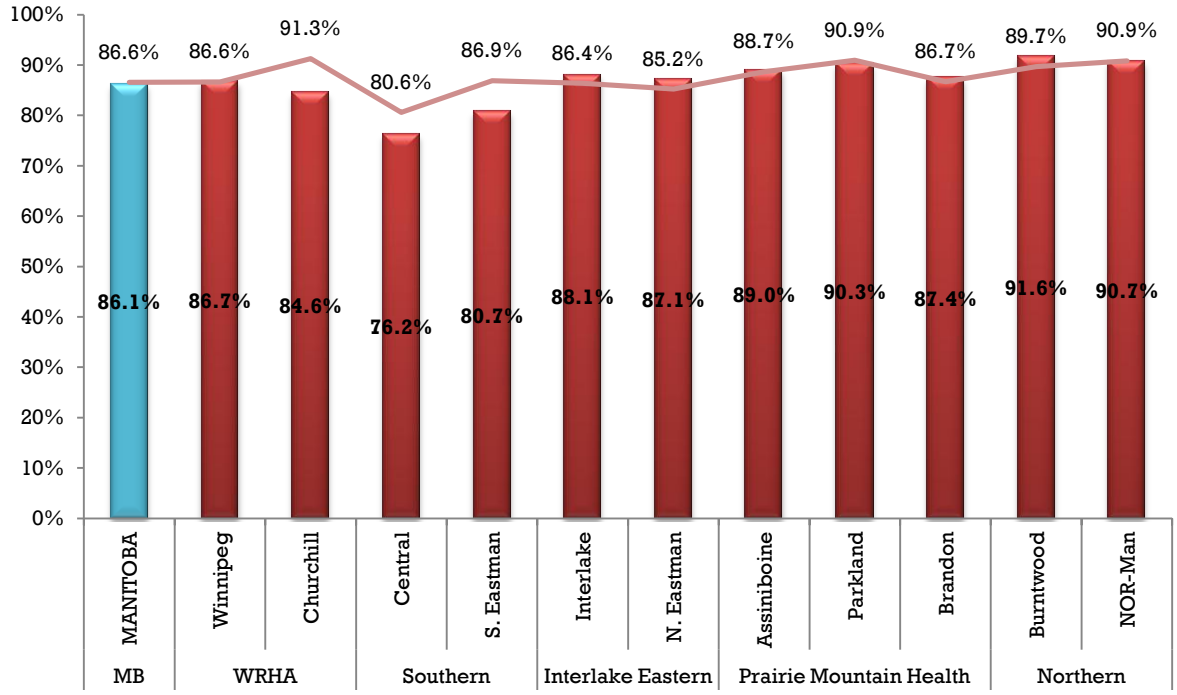
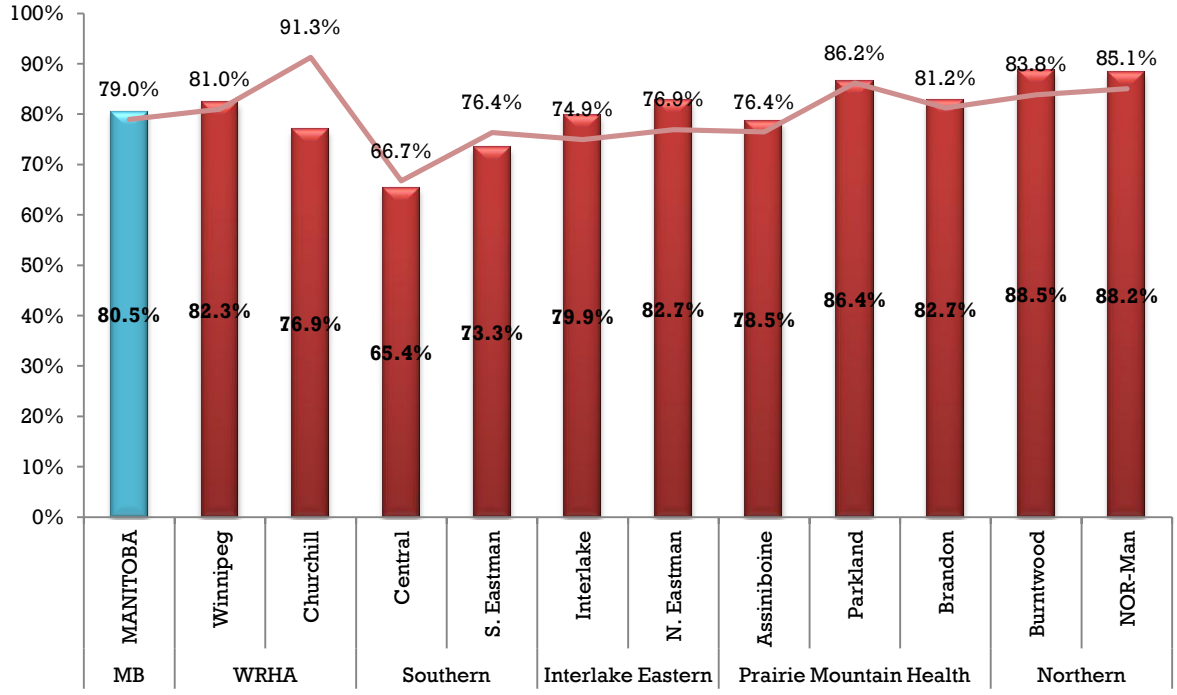


Figure 21: RHA Varicella Immunization Rates, Age 2

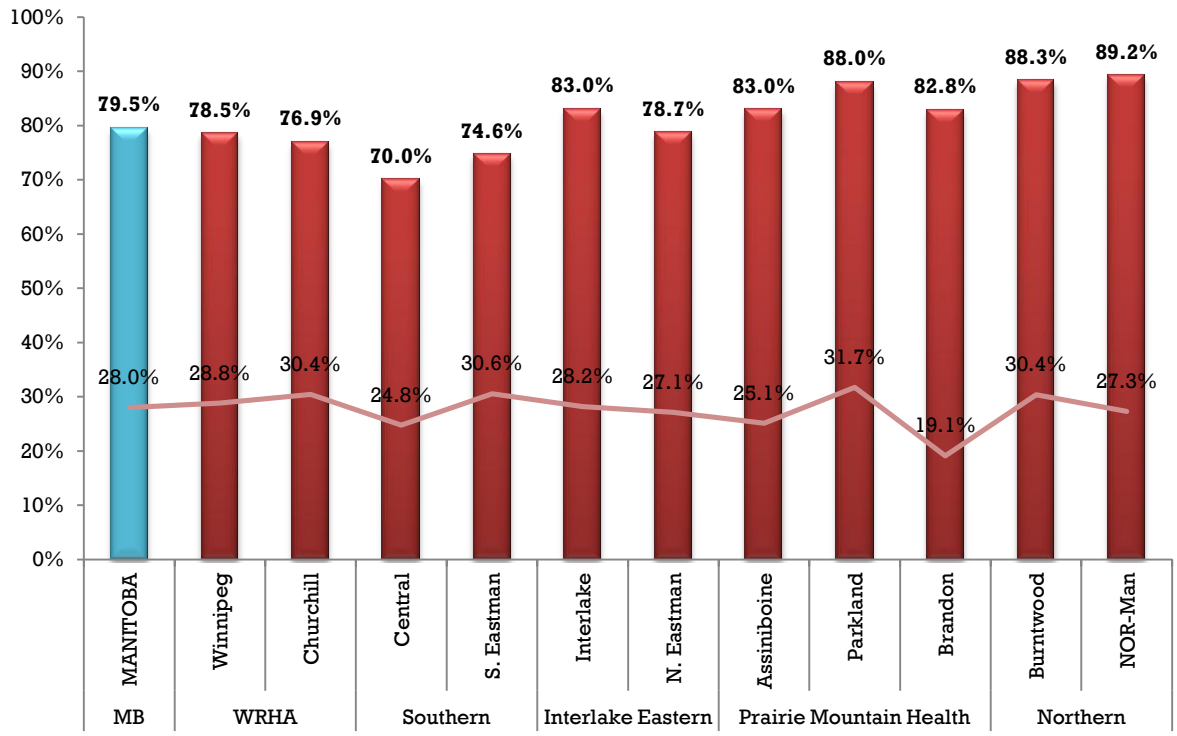
Percentage of children who are complete for age for Varicella, 2011



In Manitoba, immunization protection for mumps, rubella and measles is typically provided through the combination vaccine (MMR). The three tables reviewing rates is evidence of this, as they show very similar or exact rates by region. The varicella rates are somewhat lower overall ranging from the lowest rate of 65.4% completion in Central to 88.5% completion in Burntwood.

Meningococcal Congugate (Men C-C)

Figure 22: RHA Meningococcal Congugate (Men C-C) Immunization Rates, Age 2
Percentage of children who are complete for age for Men C-C, 2011

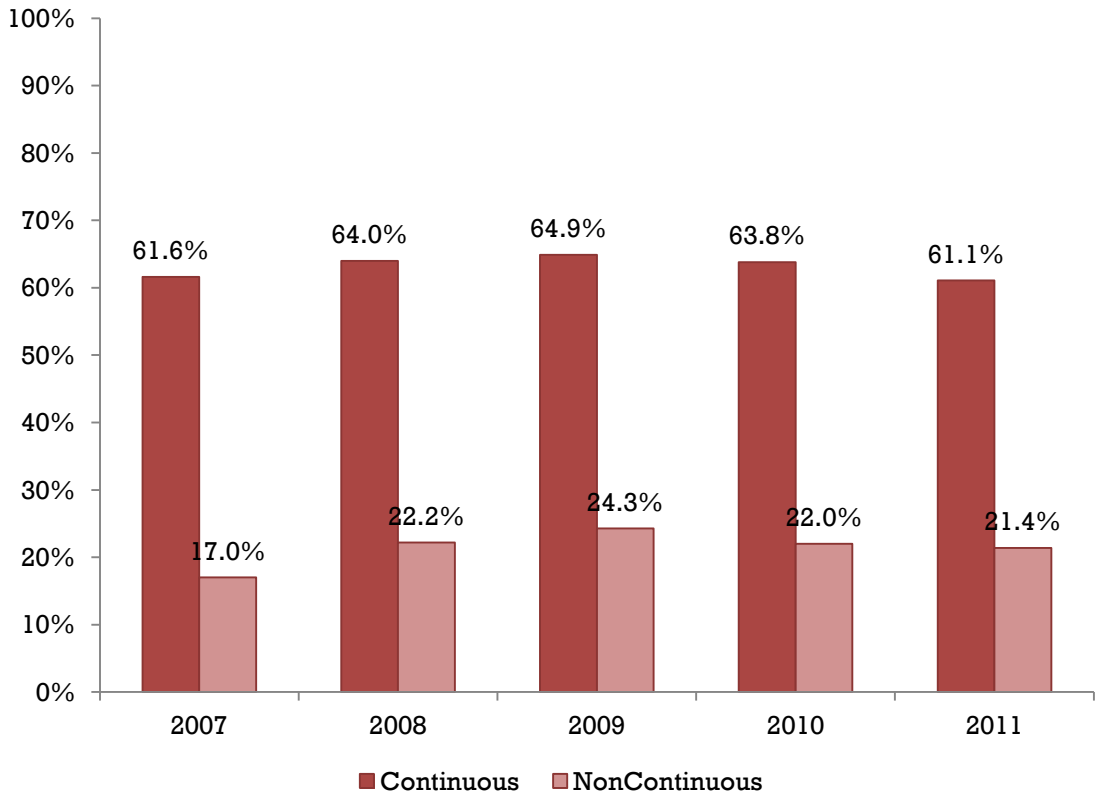


In 2009, the Meningococcal C Conjugate (Men-C-C) vaccine was introduced for all infants at the 12 month mark to be given at the same time as the varicella and measles, mumps, rubella (MMR) vaccines. Previous to that time, Men C-C was only provided to young children with high-risk medical conditions and/or grade four students. The change in protocol can be seen in the figure. The data reflects that a higher proportion of two year olds received Men C-C in 2011 than in previous years. In 2011, at least seven in ten two year old children had received the Men C-C vaccine. In some RHAs (Parkland, Burntwood and Nor-Man), the rates were almost nine out of ten.

In 2011, about 80% of two year olds had received Men C-C. In some RHAs, the rates were even higher: almost nine out of ten two year olds were vaccinated with Men C-C in Nor-Man, Burntwood and Parkland.

Section C: Residency and Immunization Rates

Figure 23: Percentage of Children Complete for Age at 2 Years by Continuous and Non-Continuous Resident Status (2007-2011), Age 2



The percentages of two year olds considered complete for age is substantially higher for continuous residents in comparison to non-continuous residents.

From 2007-2011, approximately two-thirds of continuous residents were complete for age at two years compared to approximately one-quarter of non-continuous residents. Additional explanations on the reasons for these differences in rates can be found on page 8.

Section D: Overview of All Immunization Rates by RHA- 2 Year Olds

Table 4: Percentages and Three Year Averages (2008-2010) for Immunogens

AGE 2	MB	WRHA		Southern		Interlake Eastern		Prairie Mountain			Northern	
	MANITOBA	Winnipeg	Churchill	Central	S. Eastman	Interlake	N. Eastman	Assiniboine	Parkland	Brandon	Burntwood	NOR-Man
Population	**16384**	**8138**	**13**	**1687**	**1136**	**889**	**521**	**833**	**590**	**793**	**1292**	**492**
Diptheria	**11297**	**5687**	**8**	**996**	**773**	**628**	**345**	**630**	**444**	**583**	**866**	**337**
2011	69.0%	69.9%	61.5%	59.0%	68.0%	70.6%	66.2%	75.6%	75.3%	73.5%	67.0%	68.5%
2008-2010	*70.8%*	*71.7%*	*89.1%*	*63.2%*	*76.4%*	*70.6%*	*66.1%*	*76.1%*	*77.9%*	*70.9%*	*65.7%*	*70.0%*
Tetanus	**11297**	**5687**	**8**	**996**	**773**	**628**	**345**	**630**	**444**	**583**	**866**	**337**
2011	69.0%	69.9%	61.5%	59.0%	68.0%	70.6%	66.2%	75.6%	75.3%	73.5%	67.0%	68.5%
2008-2010	*70.8%*	*71.7%*	*89.1%*	*63.2%*	*76.4%*	*70.6%*	*66.1%*	*76.1%*	*77.9%*	*70.9%*	*65.7%*	*70.0%*
Pertussis	**11287**	**5681**	**8**	**996**	**773**	**625**	**344**	**630**	**444**	**583**	**866**	**337**
2011	68.9%	69.8%	61.5%	59.0%	68.0%	70.3%	66.0%	75.6%	75.3%	73.5%	67.0%	68.5%
2008-2010	*70.7%*	*71.6%*	*89.1%*	*63.2%*	*76.4%*	*70.5%*	*66.1%*	*76.1%*	*77.9%*	*70.9%*	*65.7%*	*70.0%*
Hib	**11204**	**5629**	**7**	**990**	**766**	**621**	**344**	**627**	**442**	**579**	**865**	**334**
2011	68.4%	69.2%	53.8%	58.7%	67.4%	69.9%	66.0%	75.3%	74.9%	73.0%	67.0%	67.9%
2008-2010	*70.2%*	*71.1%*	*89.1%*	*62.9%*	*76.0%*	*70.2%*	*65.5%*	*75.9%*	*77.7%*	*69.7%*	*65.4%*	*69.7%*
Polio	**14161**	**7048**	**11**	**1305**	**944**	**775**	**460**	**762**	**526**	**718**	**1171**	**441**
2011	86.4%	86.6%	84.6%	77.4%	83.1%	87.2%	88.3%	91.5%	89.2%	90.5%	90.6%	89.6%
2008-2010	*87.8%*	*87.7%*	*93.5%*	*81.8%*	*89.8%*	*87.5%*	*86.3%*	*90.8%*	*92.6%*	*89.0%*	*88.9%*	*91.8%*
PCV	**11021**	**5553**	**7**	**953**	**752**	**607**	**337**	**611**	**443**	**557**	**864**	**337**
2011	67.3%	68.2%	53.8%	56.5%	66.2%	68.3%	64.7%	73.3%	75.1%	70.2%	66.9%	68.5%
2008-2010	*68.0%*	*69.1%*	*87.0%*	*58.5%*	*73.4%*	*68.2%*	*64.2%*	*71.8%*	*75.8%*	*67.2%*	*65.1%*	*69.0%*
Measles	**14112**	**7064**	**11**	**1286**	**917**	**783**	**454**	**741**	**533**	**694**	**1183**	**446**
2011	86.1%	86.8%	84.6%	76.2%	80.7%	88.1%	87.1%	89.0%	90.3%	87.5%	91.6%	90.7%
2008-2010	*86.6%*	*86.7%*	*91.3%*	*80.6%*	*87.0%*	*86.4%*	*85.2%*	*88.8%*	*90.9%*	*86.9%*	*89.7%*	*90.9%*
Mumps	**14104**	**7058**	**11**	**1284**	**917**	**783**	**454**	**741**	**533**	**694**	**1183**	**446**
2011	86.1%	86.7%	84.6%	76.1%	80.7%	88.1%	87.1%	89.0%	90.3%	87.5%	91.6%	90.7%
2008-2010	*86.6%*	*86.6%*	*91.3%*	*80.6%*	*86.9%*	*86.4%*	*85.2%*	*88.7%*	*90.9%*	*86.8%*	*89.7%*	*90.9%*
Rubella	**14105**	**7059**	**11**	**1285**	**917**	**783**	**454**	**741**	**533**	**693**	**1183**	**446**
2011	86.1%	86.7%	84.6%	76.2%	80.7%	88.1%	87.1%	89.0%	90.3%	87.4%	91.6%	90.7%
2008-2010	*86.6%*	*86.6%*	*91.3%*	*80.6%*	*86.9%*	*86.4%*	*85.2%*	*88.7%*	*90.9%*	*86.7%*	*89.7%*	*90.9%*
Varicella	**13182**	**6697**	**10**	**1103**	**833**	**710**	**431**	**654**	**510**	**656**	**1144**	**434**
2011	80.5%	82.3%	76.9%	65.4%	73.3%	79.9%	82.7%	78.5%	86.4%	82.7%	88.5%	88.2%
2008-2010	*79.0%*	*81.0%*	*91.3%*	*66.7%*	*76.4%*	*74.9%*	*76.9%*	*76.4%*	*86.2%*	*81.2%*	*83.8%*	*85.1%*
Men C-C	**13024**	**6390**	**10**	**1181**	**848**	**738**	**410**	**691**	**519**	**657**	**1141**	**439**
2011	79.5%	78.5%	76.9%	70.0%	74.6%	83.0%	78.7%	83.0%	88.0%	82.8%	88.3%	89.2%
2008-2010	*28.0%*	*28.8%*	*30.4%*	*24.8%*	*30.6%*	*28.2%*	*27.1%*	*25.1%*	*31.7%*	*19.1%*	*30.4%*	*27.3%*

Immunizations at 7 Years

Section A: Immunizations in Manitoba

Table 5: Recommended Immunization Schedule- 7 Years

Vaccine	Age
	4-6 years
MMR Measles, Mumps, Rubella	♦
DTaP-IPV Diphtheria, Tetanus, Pertussis,Polio	♦

♦ A single dose given with one needle.

Manitoba's universal childhood immunization program provides added protection (sometimes described as boosting) to pre-school children against the following bacterial pathogens: diphtheria, tetanus, and pertussis. The pre-school program also provides protection against the viral infections of measles, mumps, rubella, and polio.

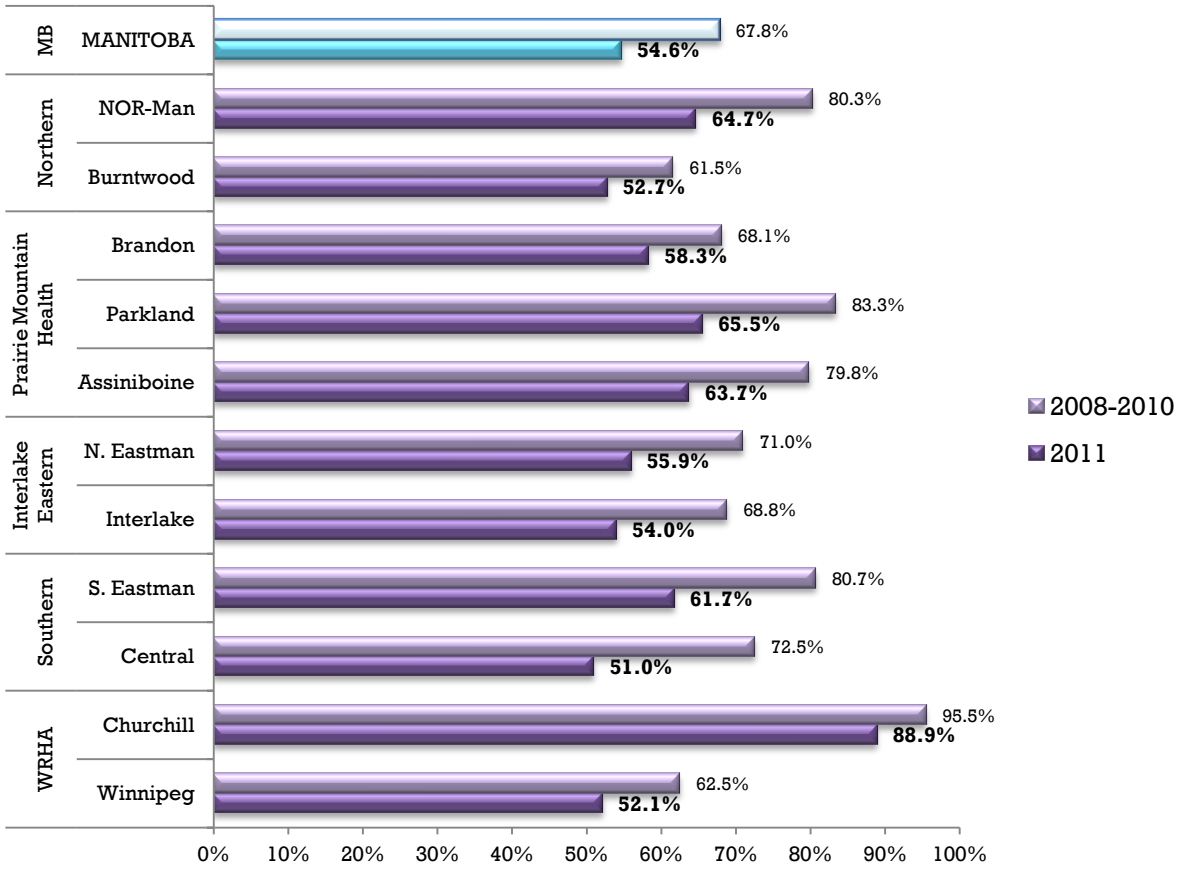
The doses are due between age four and age six, but are not counted as "missing" until the child's seventh birthday. Manitoba Health sends a reminder letter to parents of children who are missing vaccine doses at age 5.5 years, but proof of immunization is not required for school entry, as it is in some provinces (e.g. Ontario).

The immunization status of children at age seven represents those who were born in 2004 and who turned seven years old in 2011. The data reported is for children who have received all of their scheduled doses of vaccines within the recommended time periods.

About half of Manitoba`s seven year olds have received all the vaccines required to be complete for age in 2011.

Manitoba Immunization Rates, Age 7

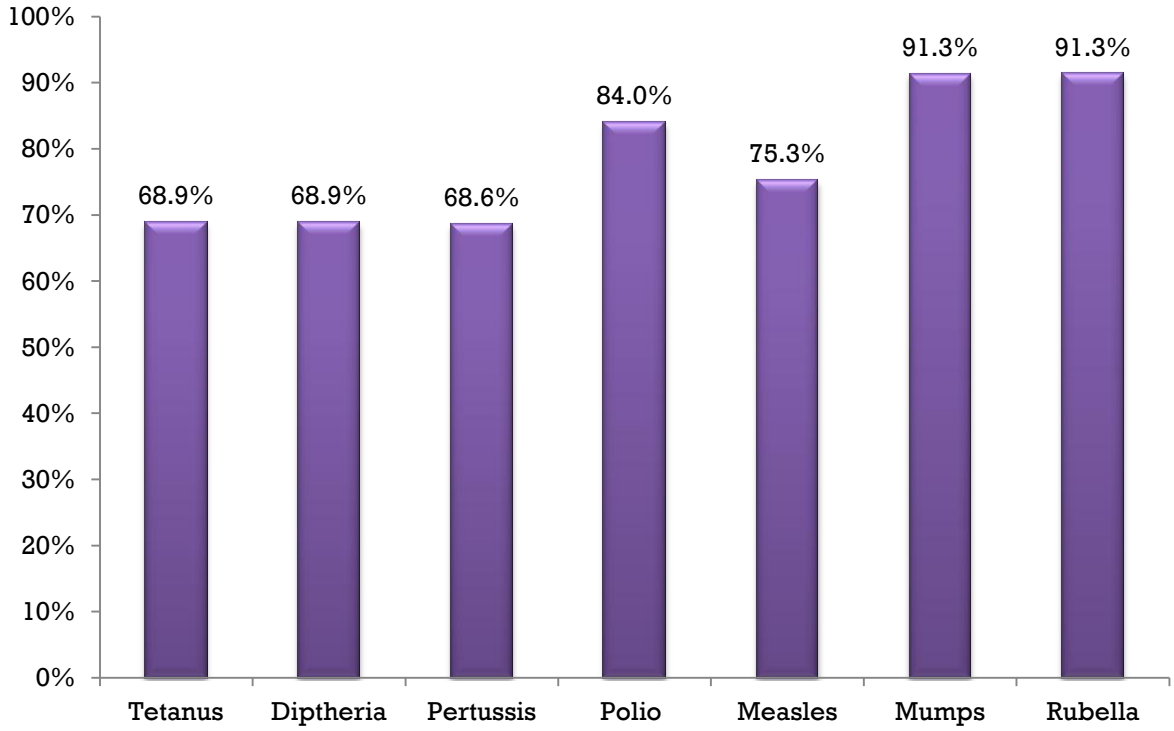
Figure 24: Percent of children who are complete from birth by RHA, 2011 & 3-year average of children who are complete from birth by RHA (2008-2010)



In Manitoba, 54.6 out of 100 seven year old children had received the immunizations required to be complete for age. This percentage is calculated with a denominator of all seven year olds in Manitoba (n=15,170) and a numerator containing all the children who had received their required vaccinations (n=8,288). The overall average did vary by RHA; Churchill RHA had the highest percentage of children vaccinated (88.9%) whereas Central RHA had the lowest (51.0%).

Figure 25: Manitoba Tetanus, Diphtheria, Pertussis, Polio, Measles, Mumps and Rubella Immunization Rates, Age 7

Percent of children who are complete from birth for the Tetanus, Diphtheria, Pertussis, Polio, Measles, Mumps and Rubella immunogens, 2011



On average, 54.6 out of 100 seven year olds in Manitoba received the series of vaccinations required to be considered complete for age in 2011. This was much lowever than the average of the previous three years (67.8%).

In order to be considered "complete for age" at seven years, children need to have 5 doses each of tetanus, diptheria, and pertussis; 4 doses of polio and Hib; 1 dose of varicella, measles, mumps and rubella; and 2 doses of measles.

For the age seven population, the diptheria, tetanus and pertussis "booster" was given to about 7 in 10 Manitobans. The new vaccines in the series- measles, mumps and rubella had slightly higher rates. The lower rates of measles immunizations is a reflection of the requirements to be "complete for age"—2 doses for measles compared to 1 for measles, mumps, rubella and polio.

Overall, the tetanus, diptheria and pertussis rates are consistent within RHAs with rates ranging from about 60-90%. The rates also appear to feel fairly consistent over time with no extreme fluctuations.

Section B: Immunization Rates by RHA

Figure 26: RHA Tetanus Immunization Rates, Age 7
Percentage of children who are complete for age for Tetanus, 2011

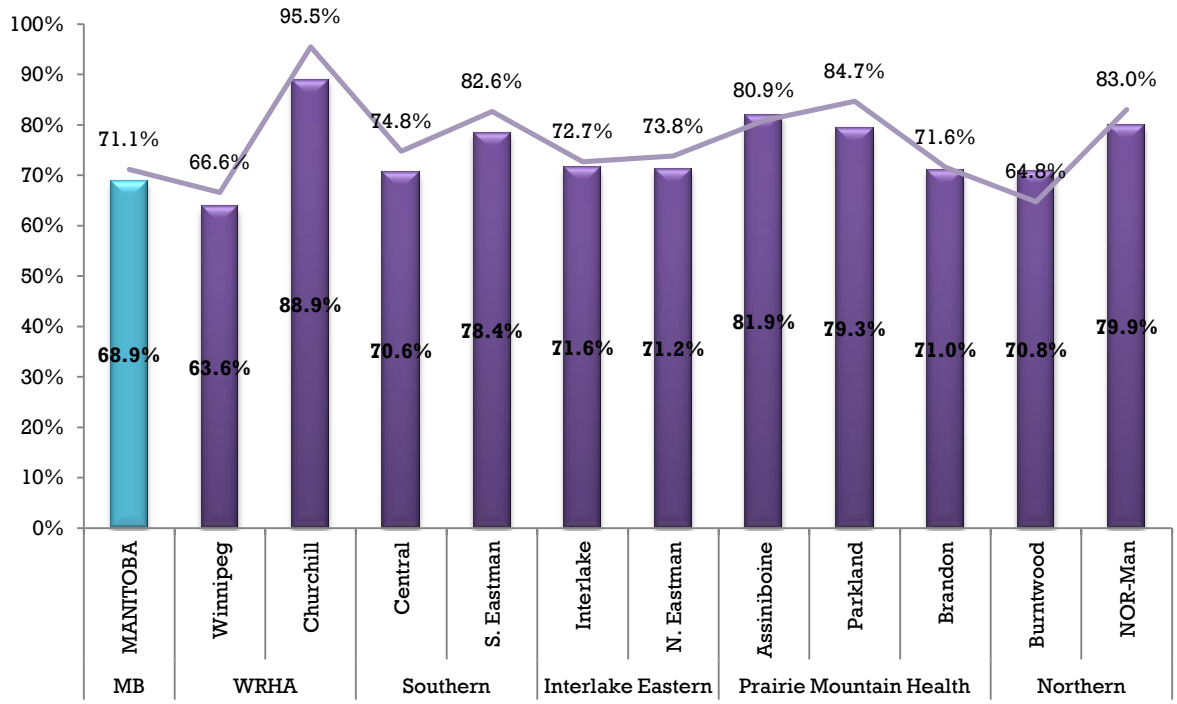


Figure 27: RHA Diptheria Immunization Rates, Age 7
Percentage of children who are complete for age for Diptheria, 2011

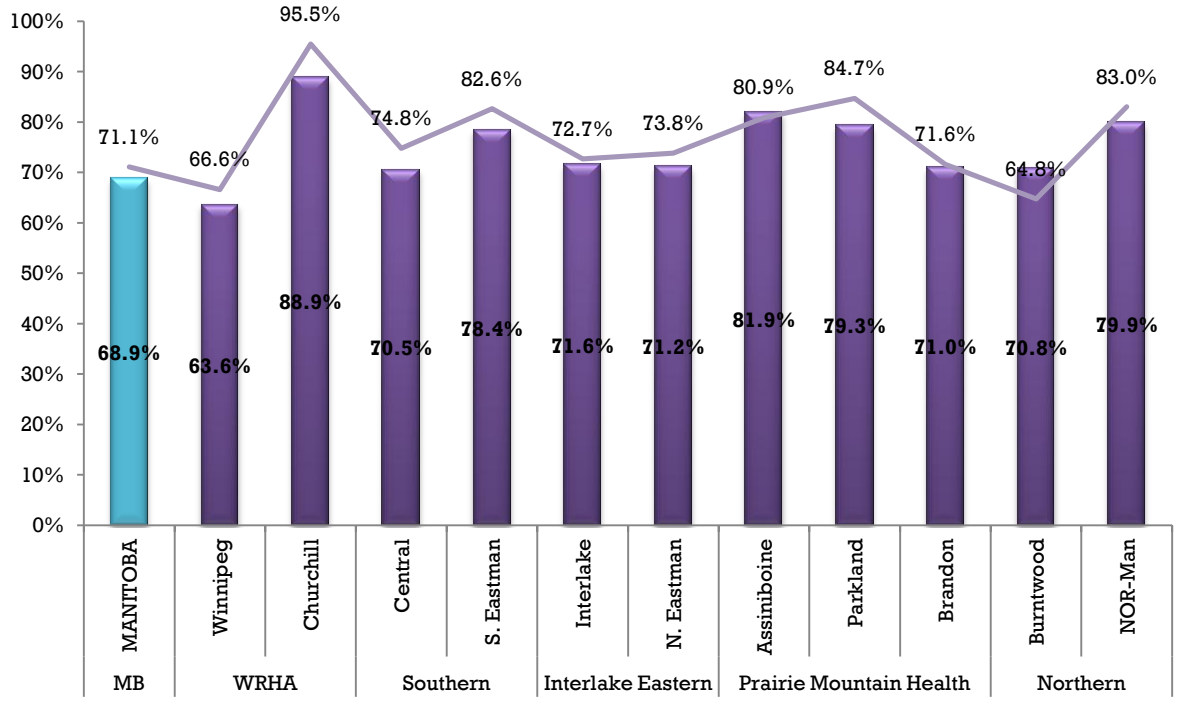


Figure 28: RHA Pertussis Immunization Rates, Age 7

Percentage of children who are complete for age for Pertussis, 2011

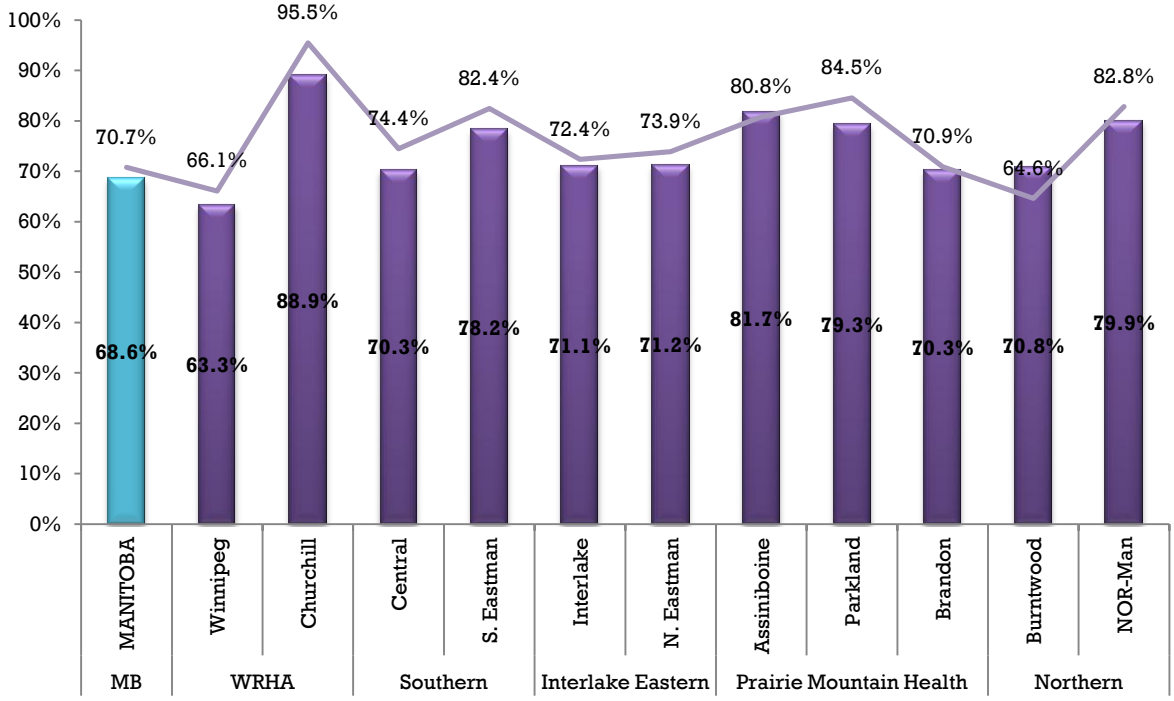
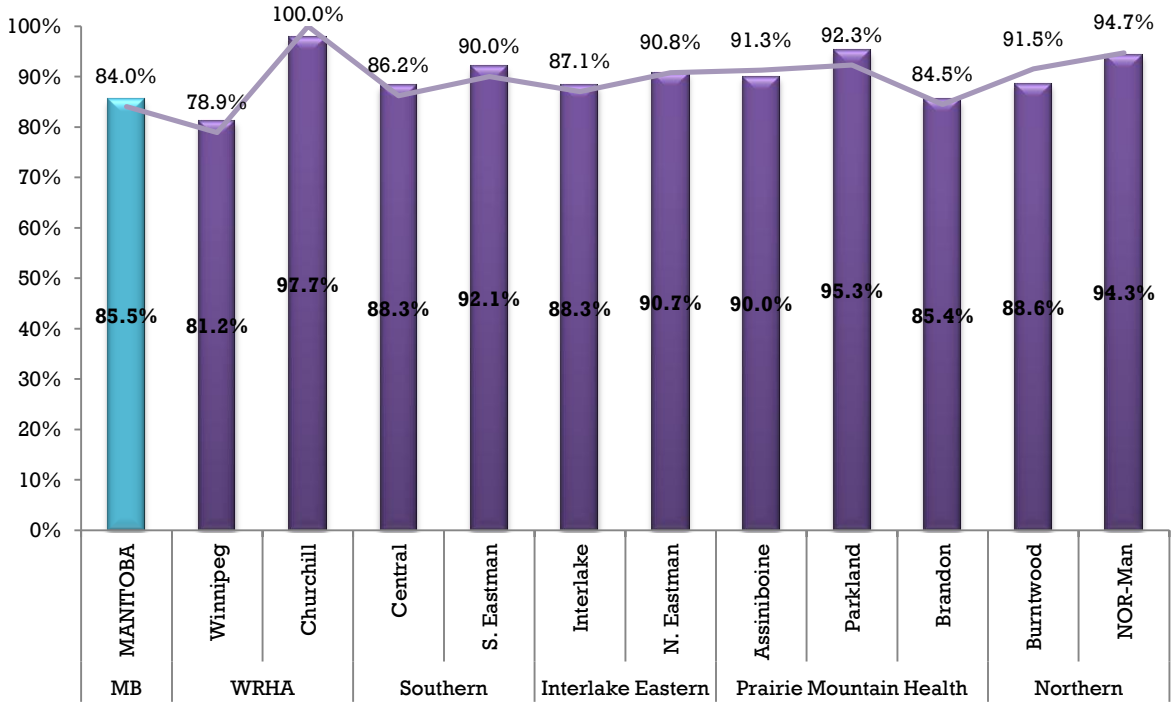


Figure 29: RHA Polio Immunization Rates, Age 7

Percentage of children who are complete for age for Polio, 2011



Measles, Mumps and Rubella

Figure 30: RHA Measles Immunization Rates, Age 7

Percentage of children who are complete for age for Measles, 2011

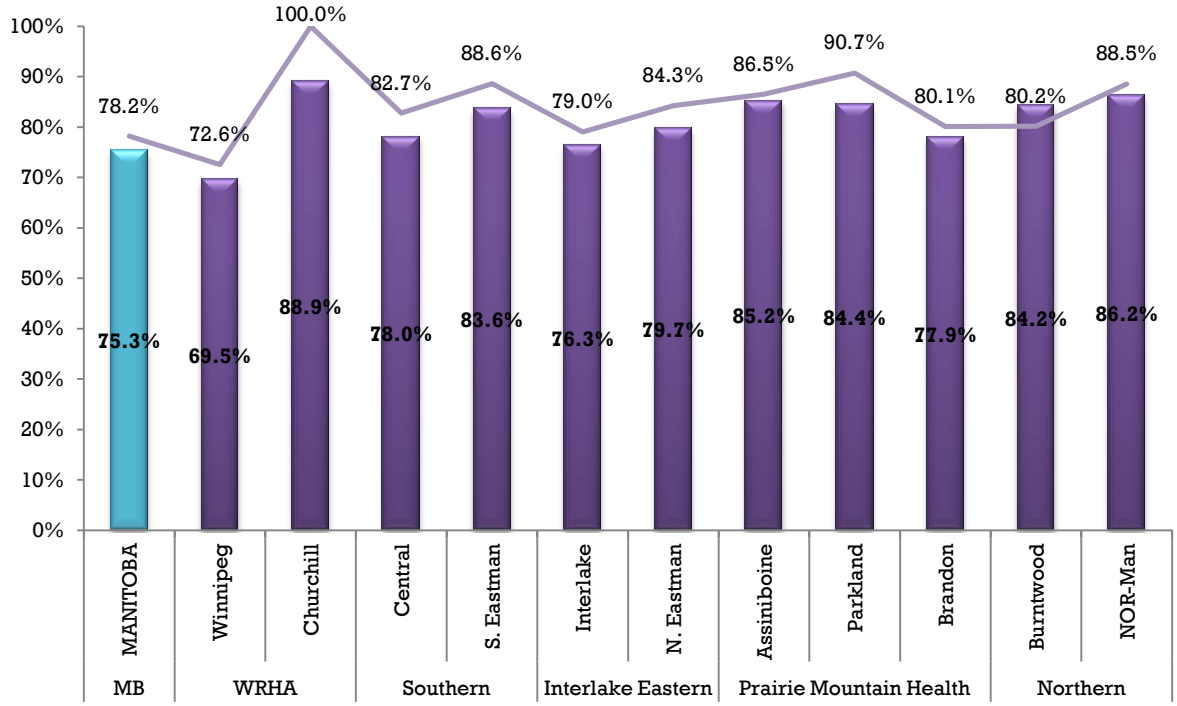


Figure 31: RHA Mumps Immunization Rates, Age 7

Percentage of children who are complete for age for Mumps, 2011

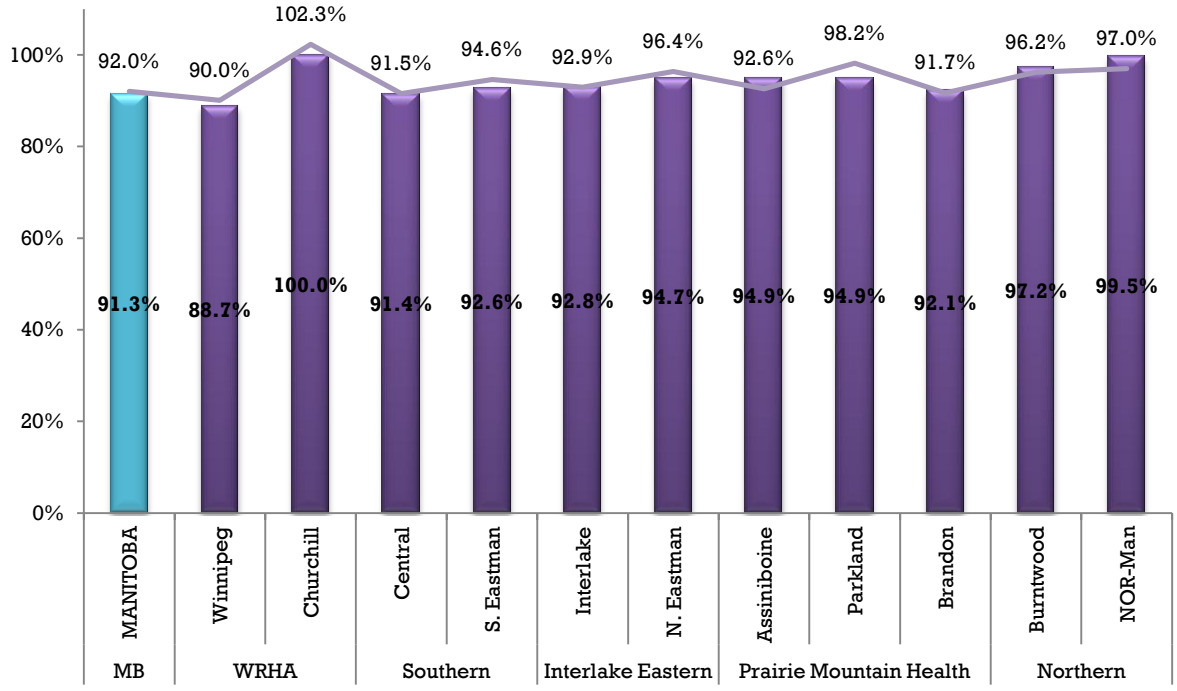
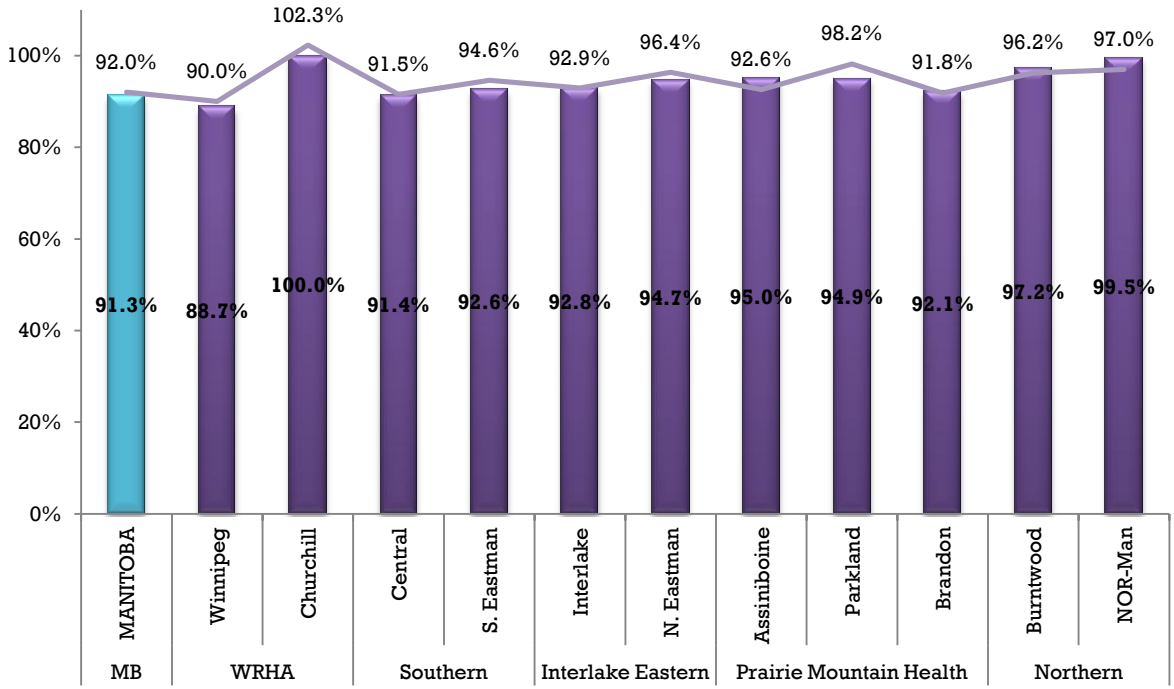


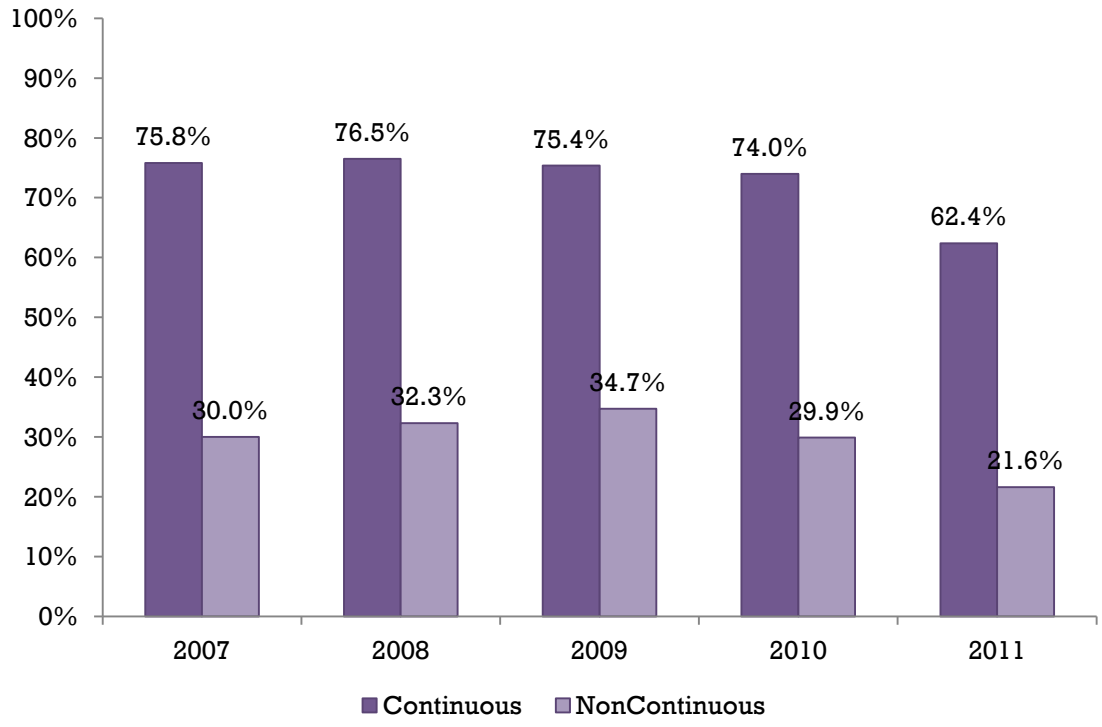
Figure 32: RHA Rubella Immunization Rates, Age 7
Percentage of children who are complete for age for Rubella, 2011



Figures 24-26 show the immunization rates for measles, mumps and rubella. Recall that only 1 dose is required for mumps and rubella which is why those rates are much higher than those shown for measles where 2 doses is required.

Section C: Residency and Immunization Rates

Figure 33: Percentage of Children Complete for Age at 7 Years by Continuous and Non-Continuous Resident Status (2007-2011), Age 7



The percentages of seven year olds considered complete for age is substantially higher for continuous residents in comparison to non-continuous residents.

From 2007-2011, approximately three quarters of continuous residents were complete for age seven year olds compared to approximately one-third of non-continuous residents. Additional explanations on the reasons for these differences in rates can be found on page 8.

Section D: Overview of All Immunization Rates by RHA- 7 Year Olds

Table 6: Percentages and Three Year Averages (2008-2010) for Immunogens

AGE 7	MB	WRHA		Southern		Interlake Eastern		Prairie Mountain			Northern	
	MANITOBA	Winnipeg	Churchill	Central	S. Eastman	Interlake	N. Eastman	Assiniboine	Parkland	Brandon	Burntwood	NOR-Man
Population	**15170**	**7691**	**9**	**1597**	**1042**	**865**	**531**	**805**	**507**	**696**	**1028**	**399**
Diptheria	**10446**	**4895**	**8**	**1127**	**817**	**619**	**378**	**659**	**402**	**494**	**728**	**319**
2011	68.9%	63.6%	88.9%	70.6%	78.4%	71.6%	71.2%	81.9%	79.3%	71.0%	70.8%	79.9%
2008-2010	*71.1%*	*66.6%*	*95.5%*	*74.8%*	*82.6%*	*72.7%*	*73.8%*	*80.9%*	*84.7%*	*71.6%*	*64.8%*	*83.0%*
Tetanus	**10445**	**4895**	**8**	**1126**	**817**	**619**	**378**	**659**	**402**	**494**	**728**	**319**
2011	68.9%	63.6%	88.9%	70.5%	78.4%	71.6%	71.2%	81.9%	79.3%	71.0%	70.8%	79.9%
2008-2010	*71.1%*	*66.6%*	*95.5%*	*74.8%*	*82.6%*	*72.7%*	*73.8%*	*80.9%*	*84.7%*	*71.6%*	*64.8%*	*83.0%*
Pertussis	**10401**	**4866**	**8**	**1123**	**815**	**615**	**378**	**658**	**402**	**489**	**728**	**319**
2011	68.6%	63.3%	88.9%	70.3%	78.2%	71.1%	71.2%	81.7%	79.3%	70.3%	70.8%	79.9%
2008-2010	*70.7%*	*66.1%*	*95.5%*	*74.4%*	*82.4%*	*72.4%*	*73.9%*	*80.8%*	*84.5%*	*70.9%*	*64.6%*	*82.8%*
Hib	**11654**	**5574**	**9**	**1249**	**894**	**686**	**440**	**706**	**440**	**514**	**790**	**346**
2011	76.8%	72.5%	100.0%	78.2%	85.8%	79.3%	82.9%	87.7%	86.8%	73.9%	76.8%	86.7%
2008-2010	*77.5%*	*74.1%*	*95.5%*	*80.1%*	*85.9%*	*80.2%*	*80.3%*	*85.0%*	*89.4%*	*76.5%*	*71.4%*	*87.1%*
Polio	**12746**	**6070**	**9**	**1377**	**938**	**753**	**482**	**735**	**468**	**588**	**941**	**378**
2011	84.0%	78.9%	100.0%	86.2%	90.0%	87.1%	90.8%	91.3%	92.3%	84.5%	91.5%	94.7%
2008-2010	*85.5%*	*81.2%*	*97.7%*	*88.3%*	*92.1%*	*88.3%*	*90.7%*	*90.0%*	*95.3%*	*85.4%*	*88.6%*	*94.3%*
PCV	**6860**	**3422**	**8**	**670**	**491**	**399**	**266**	**370**	**271**	**310**	**443**	**205**
2011	45.2%	44.5%	88.9%	42.0%	47.1%	46.1%	50.1%	46.0%	53.5%	44.5%	43.1%	51.4%
2008-2010	*3.3%*	*4.2%*	*2.3%*	*2.1%*	*3.9%*	*2.7%*	*2.3%*	*2.4%*	*1.6%*	*4.4%*	*0.3%*	*0.8%*
Measles	**11416**	**5342**	**8**	**1245**	**871**	**660**	**423**	**686**	**428**	**542**	**866**	**344**
2011	75.3%	69.5%	88.9%	78.0%	83.6%	76.3%	79.7%	85.2%	84.4%	77.9%	84.2%	86.2%
2008-2010	*78.2%*	*72.6%*	*100.0%*	*82.7%*	*88.6%*	*79.0%*	*84.3%*	*86.5%*	*90.7%*	*80.1%*	*80.2%*	*88.5%*
Mumps	**13855**	**6824**	**9**	**1459**	**965**	**803**	**503**	**764**	**481**	**641**	**999**	**397**
2011	91.3%	88.7%	100.0%	91.4%	92.6%	92.8%	94.7%	94.9%	94.9%	92.1%	97.2%	99.5%
2008-2010	*92.0%*	*90.0%*	*102.3%*	*91.5%*	*94.6%*	*92.9%*	*96.4%*	*92.6%*	*98.2%*	*91.7%*	*96.2%*	*97.0%*
Rubella	**13857**	**6825**	**9**	**1459**	**965**	**803**	**503**	**765**	**481**	**641**	**999**	**397**
2011	91.3%	88.7%	100.0%	91.4%	92.6%	92.8%	94.7%	95.0%	94.9%	92.1%	97.2%	99.5%
2008-2010	*92.0%*	*90.0%*	*102.3%*	*91.5%*	*94.6%*	*92.9%*	*96.4%*	*92.6%*	*98.2%*	*91.8%*	*96.2%*	*97.0%*
Varicella	**10924**	**5580**	**9**	**1029**	**745**	**601**	**384**	**589**	**392**	**533**	**738**	**318**
2011	72.0%	72.6%	100.0%	64.4%	71.5%	69.5%	72.3%	73.2%	77.3%	76.6%	71.8%	79.7%
2008-2010	*40.7%*	*43.8%*	*90.9%*	*33.4%*	*37.2%*	*38.6%*	*37.2%*	*40.1%*	*45.6%*	*46.3%*	*30.0%*	*41.0%*
Men C-C	**1396**	**806**	**1**	**123**	**128**	**78**	**54**	**55**	**36**	**54**	**37**	**23**
2011	9.2%	10.5%	11.1%	7.7%	12.3%	9.0%	10.2%	6.8%	7.1%	7.8%	3.6%	5.8%
2008-2010	*6.7%*	*8.0%*	*4.5%*	*5.5%*	*8.8%*	*6.7%*	*4.3%*	*6.1%*	*5.3%*	*6.0%*	*1.1%*	*3.0%*

Immunizations at 11 Years

Section A: Immunizations in Manitoba

Table 7: Recommended Immunization Schedule- 11 Years

Vaccine	Age
	Grade 4
Men-C-C Meningococcal C Conjugate Vaccine *	♦
Hepatitis B Vaccine	♦♦♦

♦ A single dose given with one needle.
* Children in Grade 4 are offered a single dose until 2017, at which point this Grade 4 Program will be discontinued.

At age 11, Manitoba's universal childhood immunization program provides protection against the bacterial pathogens Meningococcal C- Conjugate (Men C-C) and the viral infection of Hepatitis B. The immunization status of children at age 11 represents those who were born in 2000 and who turned 11 years old in 2011. The data reported is for children who are complete for age, or those who have received all of their scheduled doses of vaccines within the recommended time periods as shown in Table 7.

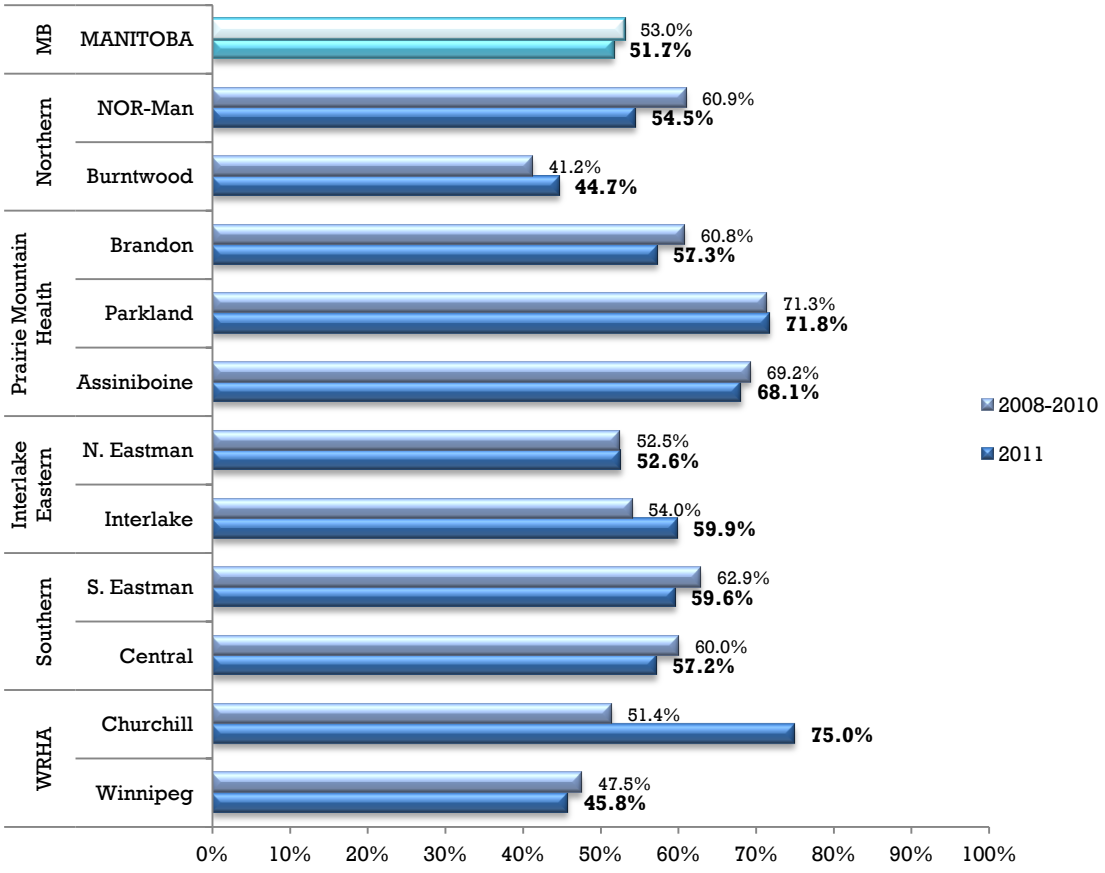
In 2004, Manitoba Health began publicly-funding the Men-C-C vaccine for all children in Grade 4; then in 2009, the Men-C-C vaccine began being offered to infants at 12 months. However in Manitoba, only one dose of Men-C-C is recommended to be considered complete for age. Therefore, the original Grade 4 Program will be phased out in 2017 when all children who were immunized at 12 months of age will have been offered the vaccine (and will have received the full number of recommended Men-C-C doses to be considered complete for age from birth).

Manitoba's hepatitis B immunization program was introduced in 1998 for children born on or after January 1, 1989. A total of three doses of hepatitis B are required to obtain adequate immunity and to be considered complete for age from birth.

The immunization status of children at age 11 represents those who were born in 2000 and who turned 11 years old in 2011. The data reported is for children who are complete for age, or those who have received all of their scheduled doses of vaccines within the recommended time periods as shown in Table 7.

Manitoba Immunization Rates, Age 11

Figure 34: Percent of children who are complete from birth by RHA, 2011 & 3-year average of children who are complete from birth by RHA (2008-2010)



In Manitoba, 51.7% of all 11 year olds received the vaccines available to them.

This percentage is calculated with a denominator of all 11 year olds in Manitoba (15,664) and a numerator containing all the children who had received their required vaccinations (8,093). The overall average did vary by RHA; Churchill RHA had the highest percentage of children vaccinated (75.0%) whereas Burntwood RHA had the lowest (44.7%).

Section B: Immunization Rates by RHA

Figure 35: Manitoba Meningococcal Conjugate (Men C-C) and Hepatitis B (Hep B) Immunization Rates, Age 11

Percent of children who are complete from birth for the Men C-C and Hep B vaccinations, 2011

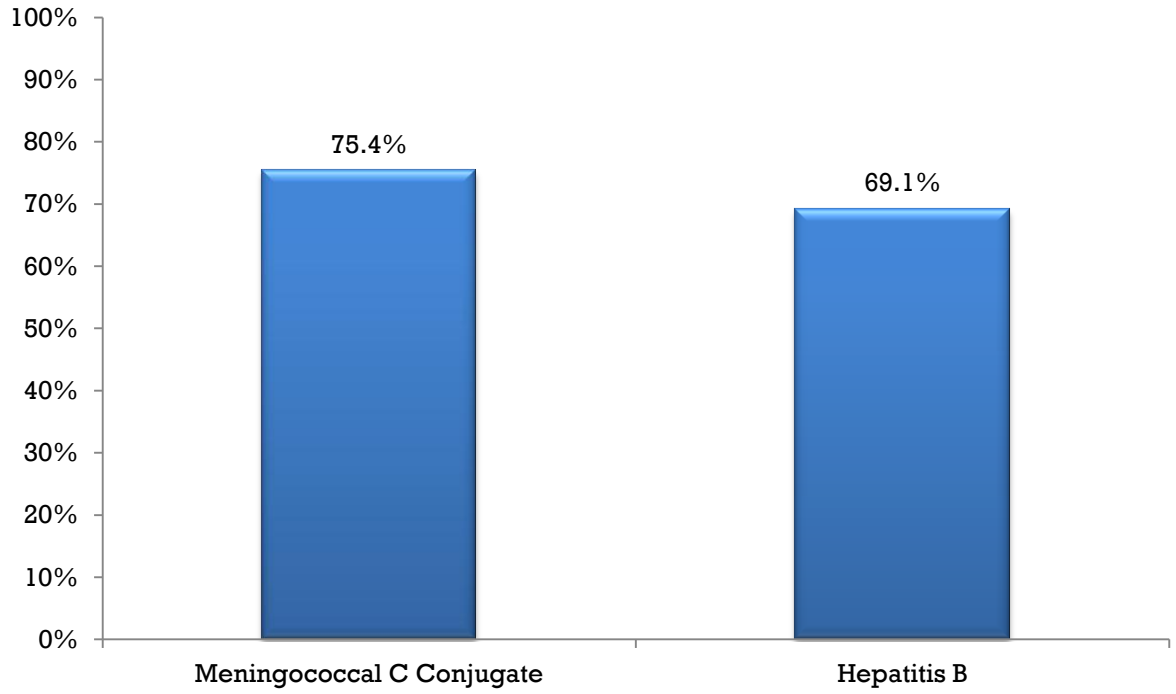
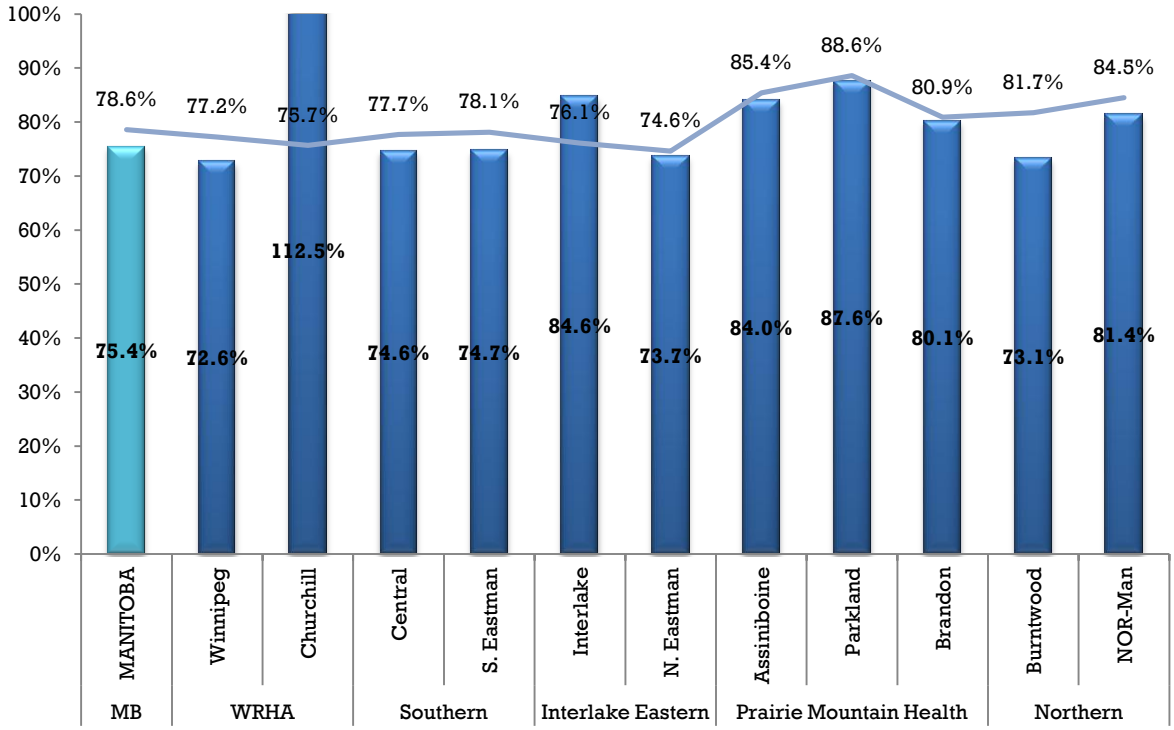
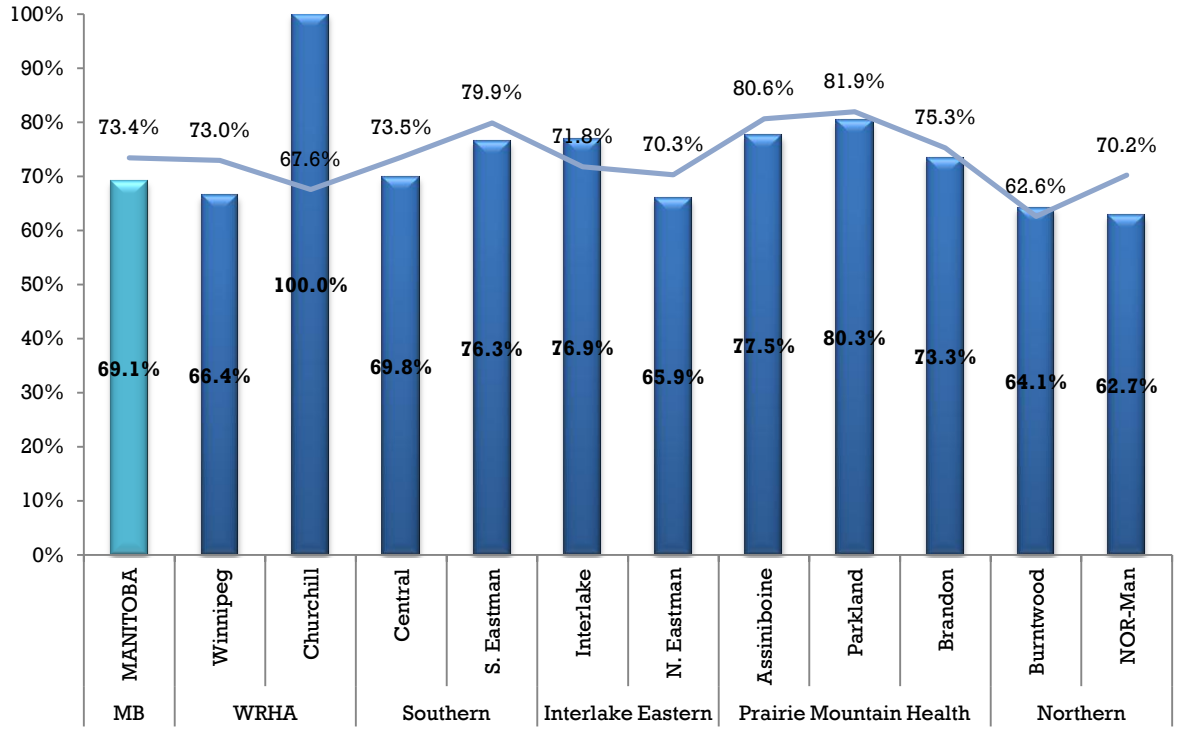


Figure 36: RHA Meningococcal Conjugate (Men C-C) Immunization Rates, Age 11
Percentage of children who are complete for age for Men C-C, 2011



In Manitoba, an average of 75.4% of 11 year olds received at least one doses of the Men C-C vaccine since birth. The rates ranged from 72.6% (Winnipeg) to 87.6% (Parkland). The impossibly high rate seen in Churchill would be a reflection of data entry error at some point along the chain of information gathering. At any point and in any RHA, errors such as this will happen. Churchill's small size makes it more obvious. Data validation is ongoing at Manitoba Health with the aim of reporting data that is as correct as possible.

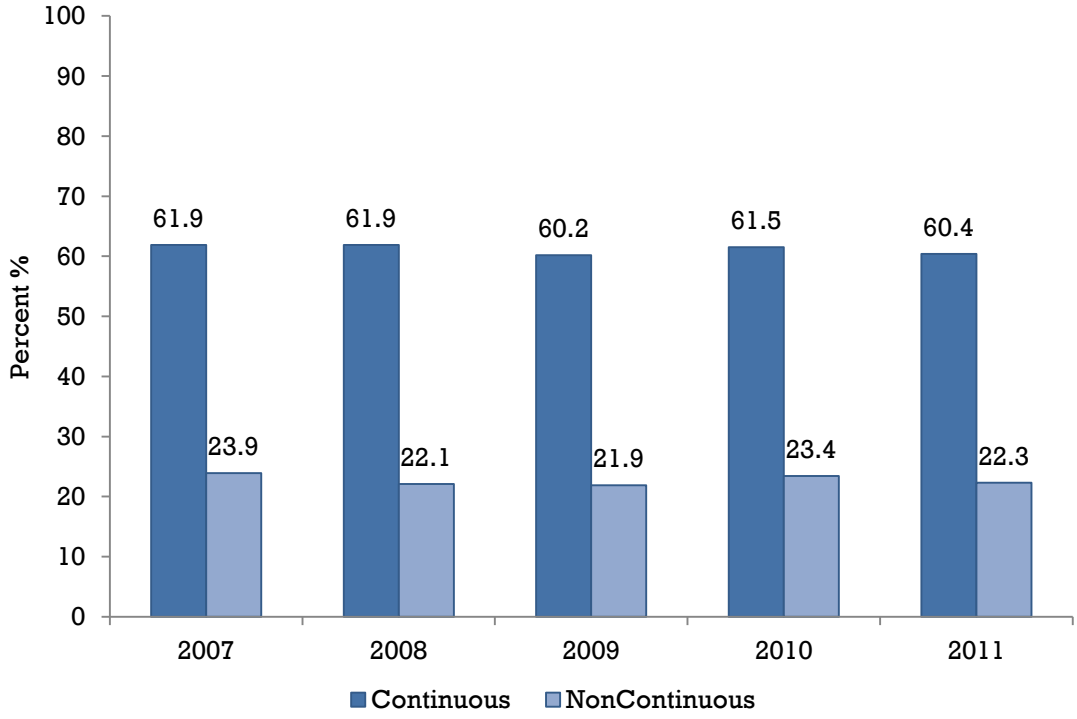
Figure 37: RHA Hepatitis B (Hep B) Immunization Rates, Age 11
Percentage of children who are complete for age for Hep B, 2011



In Manitoba, an average of 69.1% of 11 year olds has received the Hepatitis B vaccine series (3 doses) since birth. The rates ranged from 62.7% (Nor-Man) to 100% (Churchill). These rates are somewhat lower than in the previous three years, where on average, 73.4% of the 11 year olds in Manitoba were vaccinated with Hep B, and where the RHA rates ranged from 62.6% to 81.9%.

Section C: Residency and Immunization Rates

Figure 38: Percentage of Children Complete for Age at 11 Years by Continuous and Non-Continuous Resident Status (2007-2011), Age 11



The percentages of 11 year olds considered complete for age is substantially higher for continuous residents in comparison to non-continuous residents.

From 2007-2011, approximately two-thirds of continuous residents were complete for age from birth at age 11 compared to approximately one-third of non-continuous residents. Additional explanations on the reasons for these differences in rates can be found on page 8.

Section D: Overview of All Immunization Rates by RHA- 11 Year Olds

Table 8: Percentages and Three Year Averages (2008-2010) for Immunogens

AGE 11	MB	WRHA		Southern		Interlake Eastern		Prairie Mountain			Northern	
	MANITOBA	Winnipeg	Churchill	Central	S. Eastman	Interlake	N. Eastman	Assiniboine	Parkland	Brandon	Burntwood	NOR-Man
Population	**15664**	**8142**	**8**	**1668**	**1109**	**917**	**574**	**796**	**517**	**604**	**916**	**413**
Diptheria	**11286**	**5325**	**7**	**1325**	**895**	**717**	**454**	**669**	**449**	**441**	**659**	**341**
2011	72.1%	65.4%	87.5%	79.4%	80.7%	78.2%	79.1%	84.0%	86.8%	73.0%	71.9%	82.6%
2008-2010	*71.2%*	*65.4%*	*64.9%*	*79.7%*	*81.5%*	*74.2%*	*73.7%*	*81.7%*	*85.5%*	*73.5%*	*64.2%*	*84.1%*
Tetanus	**11287**	**5326**	**7**	**1325**	**895**	**717**	**454**	**669**	**449**	**441**	**659**	**341**
2011	72.1%	65.4%	87.5%	79.4%	80.7%	78.2%	79.1%	84.0%	86.8%	73.0%	71.9%	82.6%
2008-2010	*71.2%*	*65.4%*	*64.9%*	*79.7%*	*81.5%*	*74.2%*	*73.7%*	*81.7%*	*85.5%*	*73.5%*	*64.2%*	*84.1%*
Pertussis	**11147**	**5244**	**7**	**1307**	**881**	**711**	**451**	**664**	**447**	**436**	**656**	**339**
2011	71.2%	64.4%	87.5%	78.4%	79.4%	77.5%	78.6%	83.4%	86.5%	72.2%	71.6%	82.1%
2008-2010	*68.8%*	*62.4%*	*64.9%*	*77.1%*	*77.4%*	*72.3%*	*72.0%*	*80.5%*	*85.1%*	*73.0%*	*63.4%*	*83.6%*
Hib	**11684**	**5660**	**7**	**1318**	**895**	**758**	**460**	**673**	**454**	**445**	**655**	**354**
2011	74.6%	69.5%	87.5%	79.0%	80.7%	82.7%	80.1%	84.5%	87.8%	73.7%	71.5%	85.7%
2008-2010	*75.3%*	*71.3%*	*64.9%*	*79.1%*	*81.2%*	*79.6%*	*78.7%*	*84.4%*	*88.2%*	*75.7%*	*67.6%*	*87.7%*
Polio	**12948**	**6195**	**9**	**1478**	**1000**	**829**	**521**	**729**	**484**	**495**	**817**	**384**
2011	82.7%	76.1%	112.5%	88.6%	90.2%	90.4%	90.8%	91.6%	93.6%	82.0%	89.2%	93.0%
2008-2010	*82.5%*	*77.5%*	*67.6%*	*88.0%*	*89.3%*	*85.5%*	*87.5%*	*89.9%*	*94.7%*	*82.6%*	*83.6%*	*93.5%*
PCV	**21**	**12**	**0**	**1**	**4**	**2**	**0**	**0**	**0**	**0**	**2**	**0**
2011	0.1%	0.1%	0.0%	0.1%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%
2008-2010	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Measles	**12483**	**5829**	**9**	**1477**	**992**	**791**	**518**	**722**	**483**	**488**	**794**	**376**
2011	79.7%	71.6%	112.5%	88.5%	89.4%	86.3%	90.2%	90.7%	93.4%	80.8%	86.7%	91.0%
2008-2010	*78.4%*	*71.2%*	*67.6%*	*88.7%*	*90.2%*	*79.7%*	*83.8%*	*88.9%*	*93.0%*	*80.4%*	*78.9%*	*90.7%*
Mumps	**14002**	**6900**	**9**	**1559**	**1034**	**873**	**548**	**751**	**503**	**533**	**888**	**397**
2011	89.4%	84.7%	112.5%	93.5%	93.2%	95.2%	95.5%	94.3%	97.3%	88.2%	96.9%	96.1%
2008-2010	*90.1%*	*86.3%*	*73.0%*	*94.8%*	*94.1%*	*90.9%*	*95.3%*	*94.8%*	*97.3%*	*88.3%*	*95.8%*	*97.9%*
Rubella	**14003**	**6900**	**9**	**1559**	**1033**	**873**	**548**	**752**	**503**	**534**	**888**	**397**
2011	89.4%	84.7%	112.5%	93.5%	93.1%	95.2%	95.5%	94.5%	97.3%	88.4%	96.9%	96.1%
2008-2010	*90.2%*	*86.3%*	*73.0%*	*94.8%*	*94.2%*	*90.9%*	*95.3%*	*94.9%*	*97.3%*	*88.3%*	*95.8%*	*97.9%*
Varicella	**5337**	**2777**	**5**	**533**	**254**	**354**	**178**	**308**	**229**	**259**	**302**	**134**
2011	34.1%	34.1%	62.5%	32.0%	22.9%	38.6%	31.0%	38.7%	44.3%	42.9%	33.0%	32.4%
2008-2010	*19.8%*	*20.9%*	*27.0%*	*17.6%*	*13.8%*	*17.7%*	*18.1%*	*19.6%*	*27.0%*	*23.0%*	*19.1%*	*18.1%*
Men C-C	**11804**	**5911**	**9**	**1244**	**828**	**776**	**423**	**669**	**453**	**484**	**670**	**336**
2011	75.4%	72.6%	112.5%	74.6%	74.7%	84.6%	73.7%	84.0%	87.6%	80.1%	73.1%	81.4%
2008-2010	*78.6%*	*77.2%*	*75.7%*	*77.7%*	*78.1%*	*76.1%*	*74.6%*	*85.4%*	*88.6%*	*80.9%*	*81.7%*	*84.5%*

Human Papillomavirus (HPV) Immunization Program

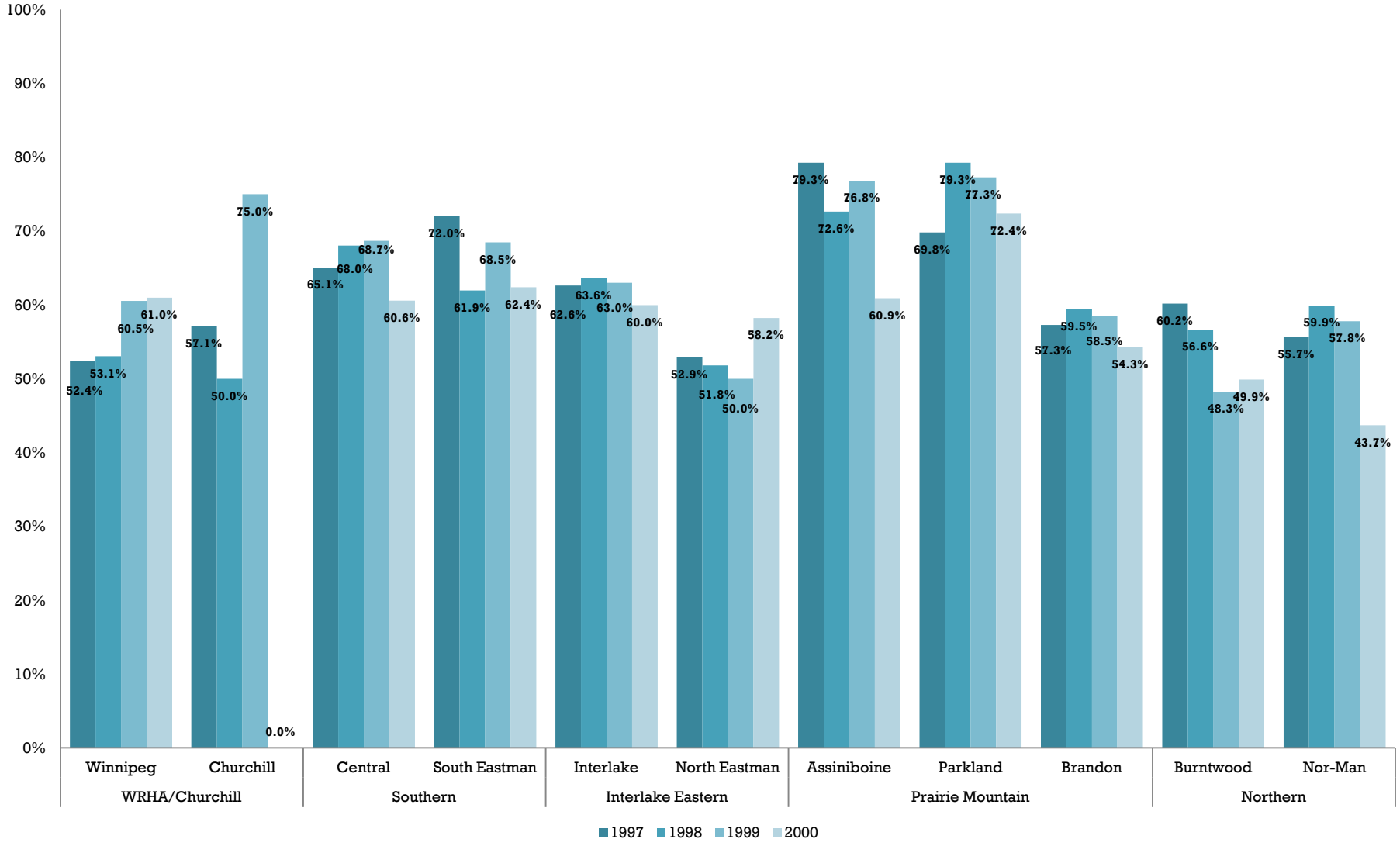
Table 9: Recommended Immunization Schedule- Grade 6 Females

Vaccine	Grade 6
Human Papillomavirus (HPV)	♦ ♦ ♦ Girls only

Human papillomavirus (HPV) is a virus that can infect many parts of the body in both men and women. While the majority of HPV infections go away over time with no treatment, some do not and can go on to cause cancer. There are over 100 different types of HPV with different levels of risk including 15 known types of "high risk" HPV that can cause growths and can lead to cancers of the cervix, vagina, vulva, penis, anus, throat and mouth.

In 2008 Manitoba introduced the HPV Immunization Program for Grade 6 girls. Data is reported by birth year and girls born in 1997 represent the first cohort to receive the HPV vaccine as part of a publicly funded program.

Figure 39: HPV Vaccine Uptake Rates- Birth Years 1997-2000, Females



The HPV program was launched in 2008, and females born in 1997 were the first eligible cohort. Likewise, females born in 1998 were eligible in 2009; those born in 1999 were eligible in 2010, and those born in 2000 were eligible in 2011. The HPV vaccine requires that three doses are given over a 6 month period, and under the publicly-funded program, school-based clinics are held through the school year to administer the required three doses in sequence. Students entering Grade 6 are, on average, 11 years old, or will be turning 11 during the school year.

In 2008, the first year of the program, more than half of the eligible females (those born in 1997) received the HPV series. The rates fluctuated by RHA that year: the lowest percentage of grade six girls that received the vaccine series were based in the WRHA (52.4%) and the highest percentage were in Assiniboine RHA (79.3%). Since launching in 2008, the uptake rates would be expected to increase over time as the school-based program becomes more established. However, this gradient has not been clearly established in any of the RHAs, with the exception of the WRHA. Rates in Winnipeg have climbed from approximately half of the eligible population to about 60 percent.

By 2011, HPV vaccine uptake in the eligible population (females born in 2000) ranged from 0% to 72.4%. Parkland had the highest rates in 2011, where about three-quarters of that RHA's grade six girls had been vaccinated. Meanwhile, Churchill had the lowest rates in 2011 as no-one was vaccinated.

The HPV vaccination program is still fairly new in Manitoba. Further study is needed to better understand both the reasons contributing to the current rates, and to establish if more can be done to increase them.

Public Health Nurses primarily administer the HPV vaccine in all of the RHAs, with the exception of Burntwood RHA. In Burntwood, the tribal council provides almost 60% of the vaccines whereas the Public Health Nurses provide about 40%. It is typical that the tribal council is the second leading provider of the vaccine as is shown in six of the RHAs (e.g. Central, Interlake, North Eastman, Assiniboine, Parkland and Nor-Man). Physicians also provide the vaccination in smaller proportions.

Immunizations at 17 Years

Section A: Immunizations in Manitoba

Table 10: Recommended Immunization Schedule- 17 Years

Vaccine	14-16 years
Tetanus, Diphtheria, Pertussis (Tdap)	♦

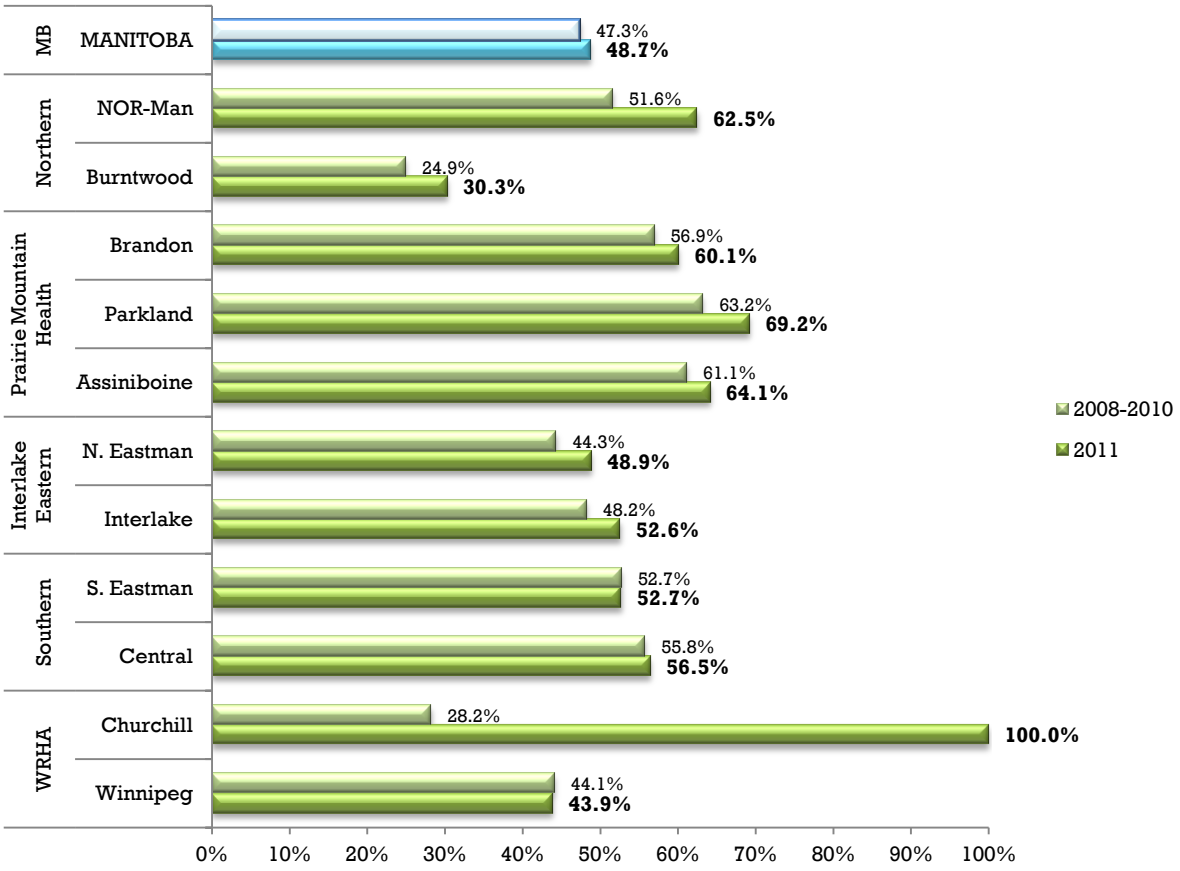
♦ A single dose given with one needle.

At age 17, Manitoba's universal childhood immunization program provides protection against the following bacterial pathogens: tetanus, diphtheria and pertussis. The immunization status of children at age 17 years represents those who were born in 1994 and who turned 17 years of age in 2011. The data reported is for children who are complete for age from birth, or those who have received all of their scheduled doses of vaccines within the recommended time periods as shown.

In 2003, the tetanus-diphtheria vaccine was replaced with the combined tetanus-diphtheria-pertussis (Tdap) vaccine. The Tdap immunization program is offered by public health nurses in the schools, in either Grades 8 or 9 (varies by region). The Tdap vaccine is due between ages 14 to 16 years of age, and may be given through the 16th year of life. This reflects the recommendation for a booster dose of tetanus-diphtheria every 10 years and the lifetime recommended booster dose of pertussis to enhance waning immunity, and the dose is not counted until it is overdue, at age 17.

Manitoba Immunization Rates, Age 17

Figure 40: Percent of children who are complete from birth by RHA, 2011 & 3-year average of children who are complete from birth by RHA (2008-2010)



In Manitoba, 48.7% of the 17 year olds were considered complete for age from birth. To be considered complete for age, this cohort would need to have six doses of the immunogens tetanus, diphtheria and pertussis, four doses of polio and Hib, two doses of measles, one dose of mumps and rubella and three doses of HPV (if female). This percentage is calculated with a denominator of all 17 year olds in Manitoba (17,695) and a numerator containing all the children who had received their required vaccinations (8,621). The overall average did vary by RHA; Churchill RHA reported vaccinating all of the 17 year olds in their region compared to Burntwood RHA which had vaccinated approximately 30%. Again, Churchill's rates will be a reflection of the small 17 year old population (N=6).

Section B: Immunization Rates by RHA

Figure 41: Manitoba Diphtheria (D), Tetanus (T), Pertussis (aP), Immunization Rates, Age 17
Percent of children who are complete from birth for the Tdap vaccinations, 2011

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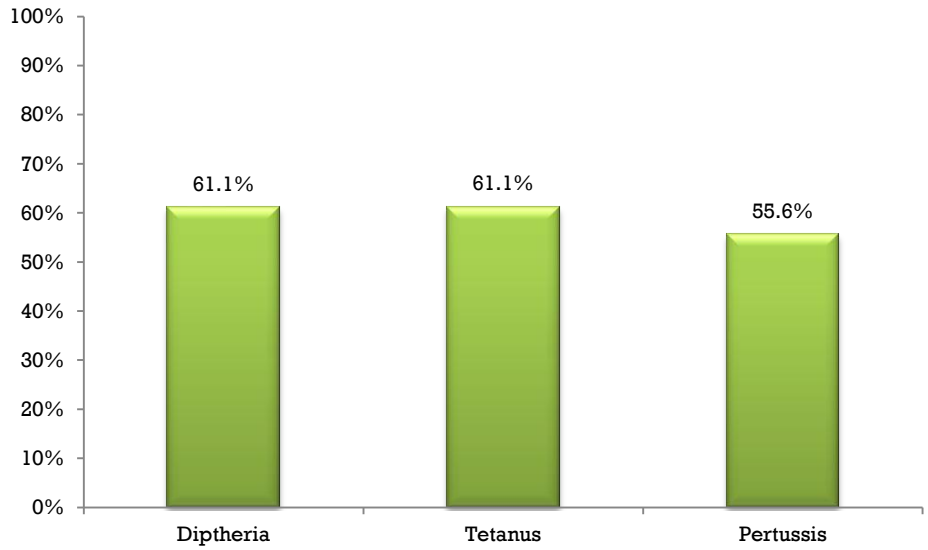


Just less than half of Manitoba`s 17 year olds were complete for age. There is variation when examining the individual immunogens required for this age group: fewer 17 year olds (55.6%) received the pertussis immunogen compared to the 61.1% who received diphtheria and tetanus.

A possible explanation for the lower pertussis rate is that some 17 year olds may have been given the tetanus-diphtheria (Td) product as a booster dose, as opposed to the recommended Tdap vaccine. The reason for this is because Td is often given in situations where Tdap is not available on hand, and there is an immediate need for immunization (e.g. wound management in a hospital emergency department). Further information, including detailed discussions with immunization providers, is recommended to explore the reason(s) for the lower than expected Tdap immunization rates in this cohort.

Tetanus, Diphtheria and Pertussis

Figure 42: RHA Tetanus Immunization Rates, Age 17
Percentage of children who are complete for age for Tetanus, 2011

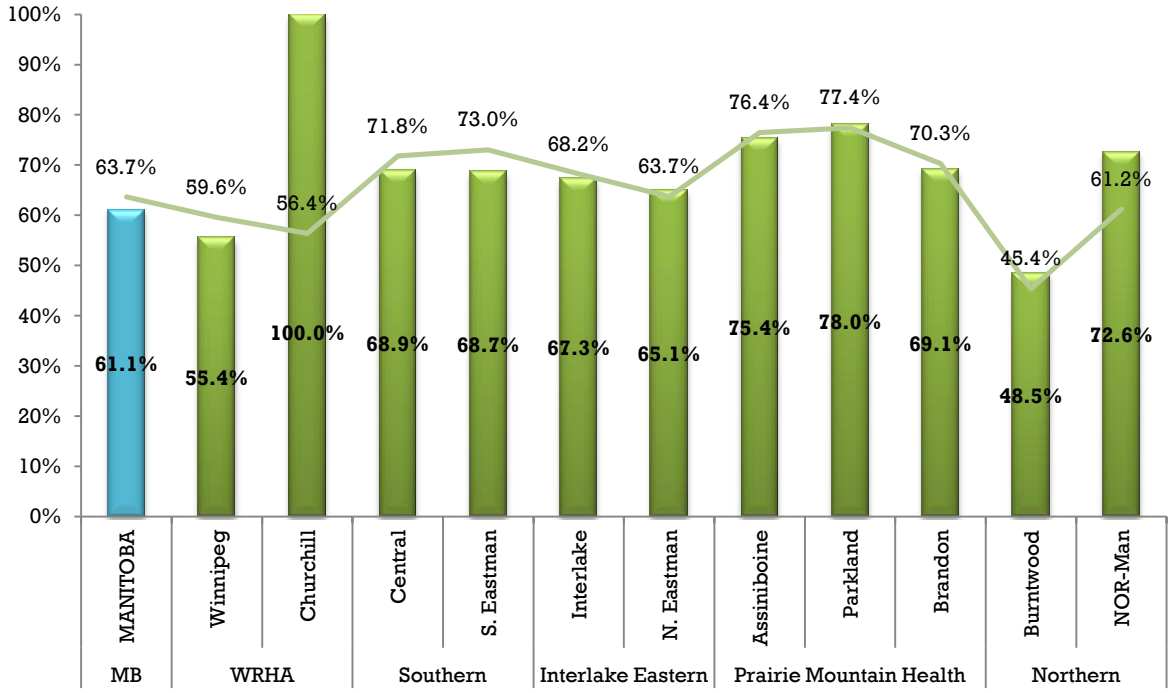


Figure 43: RHA Diphtheria Immunization Rates, Age 17
Percentage of children who are complete for age for Diptheria, 2011

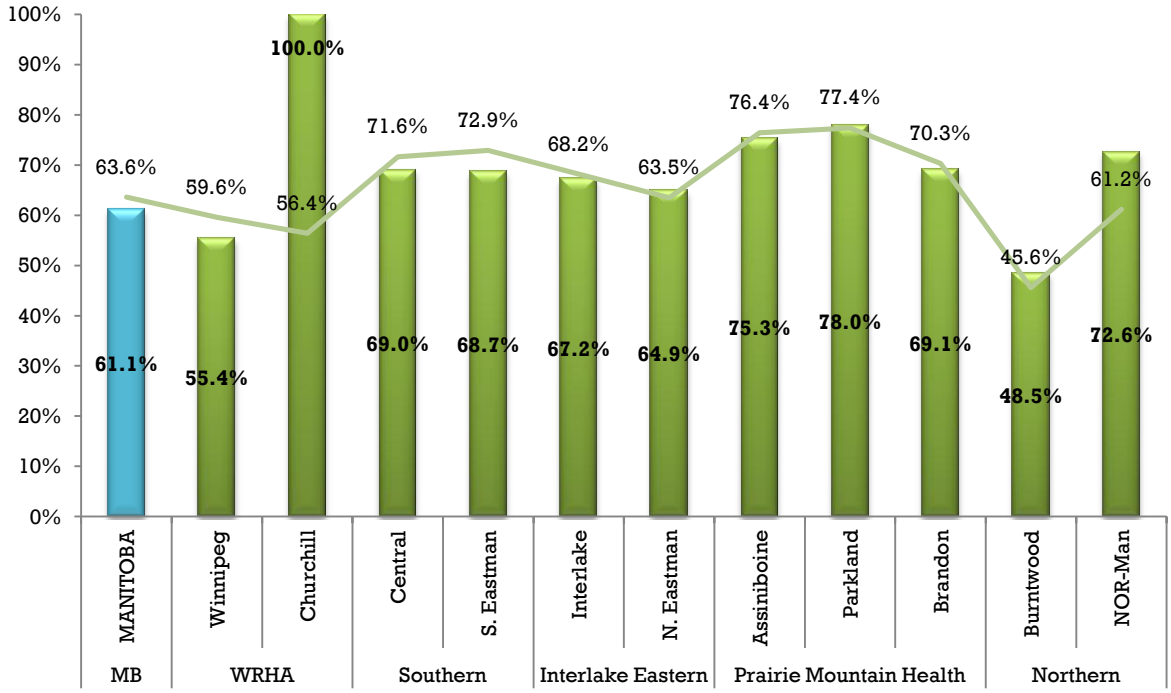
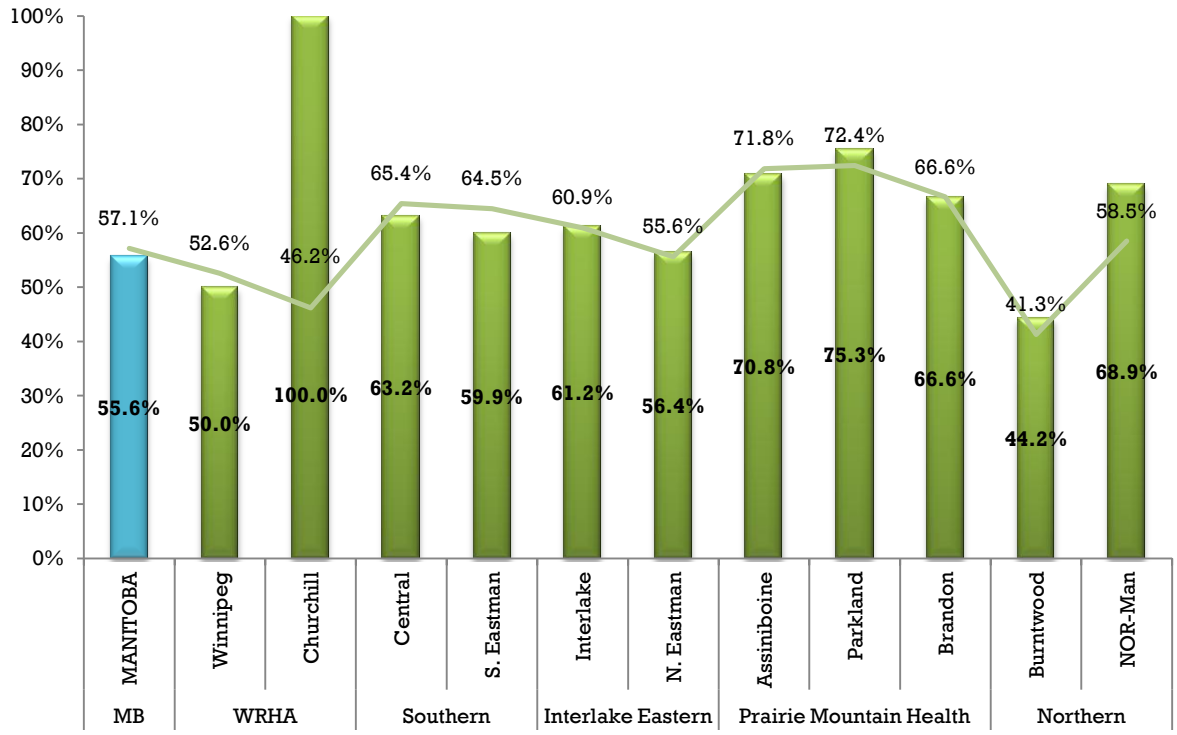


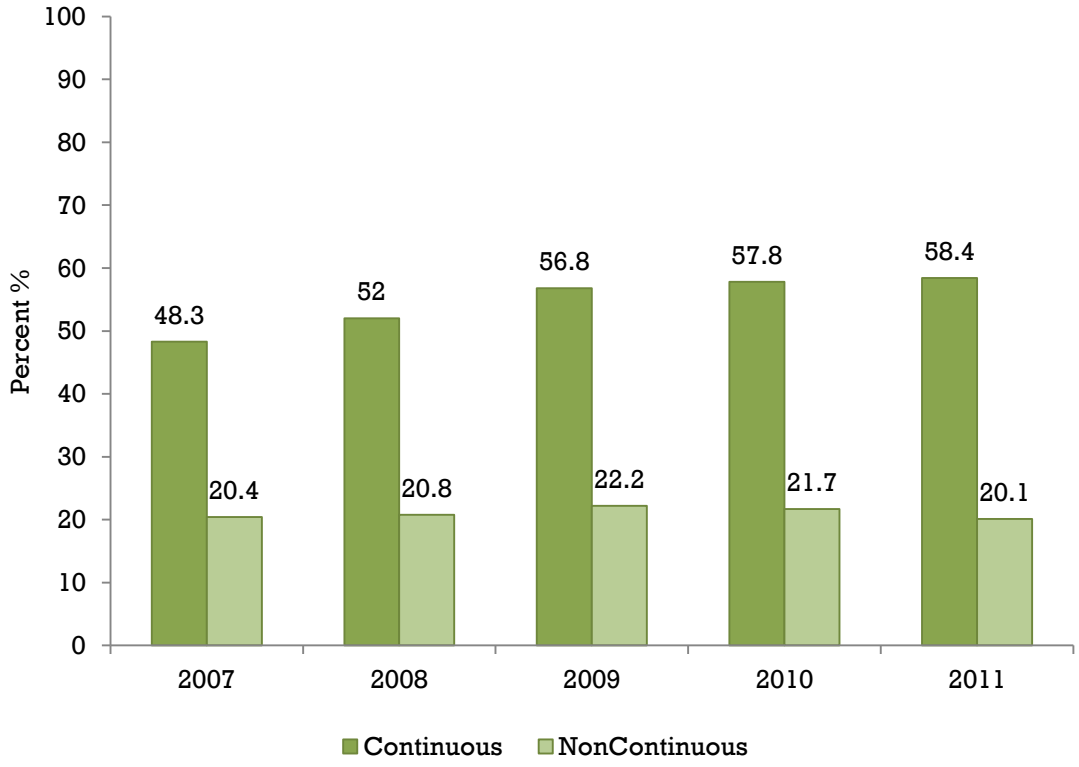
Figure 44: RHA Pertussis Immunization Rates, Age 17
Percentage of children who are complete for age for Pertussis, 2011



Figures 42-44 show rates for tetanus, diphtheria and pertussis immunizations. Rates are lower overall for pertussis across the province. The differences between the rates for tetanus and diphtheria compared to pertussis are not large yet more detail is required to have a better understanding of them.

Section C: Residency and Immunization Rates

Figure 45: Percentage of Children Complete for Age at 17 Years by Continuous and Non-Continuous Resident Status (2007-2011), Age 17



The percentages of 17 year olds considered complete for age is substantially higher for continuous residents in comparison to non-continuous residents.

From 2007-2011, approximately half of continuous residents were complete for age at one year compared to approximately one-fifth of non-continuous residents. Additional explanations on the reasons for these differences in rates can be found on page 7.

Section D: Overview of All Immunization Rates by RHA- 17 Year Olds

Table 11: Percentages and Three Year Averages (2008-2010) for Immunogens

AGE 17	MB	WRHA		Southern		Interlake Eastern		Prairie Mountain			Northern	
	MANITOBA	Winnipeg	Churchill	Central	S. Eastman	Interlake	N. Eastman	Assiniboine	Parkland	Brandon	Burntwood	NOR-Man
Population	**17695**	**9454**	**6**	**1771**	**1144**	**1145**	**653**	**945**	**604**	**634**	**934**	**405**
Diptheria	**10816**	**5238**	**6**	**1222**	**786**	**770**	**424**	**712**	**471**	**438**	**453**	**294**
2011	61.1%	55.4%	100.0%	69.0%	68.7%	67.2%	64.9%	75.3%	78.0%	69.1%	48.5%	72.6%
2008-2010	*63.6%*	*59.6%*	*56.4%*	*71.6%*	*72.9%*	*68.2%*	*63.5%*	*76.4%*	*77.4%*	*70.3%*	*45.6%*	*61.2%*
Tetanus	**10820**	**5240**	**6**	**1221**	**786**	**771**	**425**	**713**	**471**	**438**	**453**	**294**
2011	61.1%	55.4%	100.0%	68.9%	68.7%	67.3%	65.1%	75.4%	78.0%	69.1%	48.5%	72.6%
2008-2010	*63.7%*	*59.6%*	*56.4%*	*71.8%*	*73.0%*	*68.2%*	*63.7%*	*76.4%*	*77.4%*	*70.3%*	*45.4%*	*61.2%*
Pertussis	**9844**	**4725**	**6**	**1119**	**685**	**701**	**368**	**669**	**455**	**422**	**413**	**279**
2011	55.6%	50.0%	100.0%	63.2%	59.9%	61.2%	56.4%	70.8%	75.3%	66.6%	44.2%	68.9%
2008-2010	*57.1%*	*52.6%*	*46.2%*	*65.4%*	*64.5%*	*60.9%*	*55.6%*	*71.8%*	*72.4%*	*66.6%*	*41.3%*	*58.5%*
Hib	**12881**	**6539**	**5**	**1371**	**844**	**909**	**504**	**786**	**525**	**455**	**598**	**341**
2011	72.8%	69.2%	83.3%	77.4%	73.8%	79.4%	77.2%	83.2%	86.9%	71.8%	64.0%	84.2%
2008-2010	*47.6%*	*46.5%*	*46.2%*	*49.4%*	*49.0%*	*49.1%*	*48.4%*	*53.8%*	*52.3%*	*50.9%*	*36.6%*	*51.2%*
Polio	**13868**	**7097**	**6**	**1469**	**968**	**934**	**548**	**806**	**533**	**490**	**663**	**349**
2011	78.4%	75.1%	100.0%	82.9%	84.6%	81.6%	83.9%	85.3%	88.2%	77.3%	71.0%	86.2%
2008-2010	*80.9%*	*79.6%*	*69.2%*	*84.8%*	*88.2%*	*82.5%*	*84.7%*	*85.3%*	*88.3%*	*78.7%*	*64.8%*	*82.6%*
PCV	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
2011	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
2008-2010	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Measles	**14311**	**7103**	**6**	**1608**	**1049**	**927**	**580**	**838**	**571**	**510**	**754**	**361**
2011	80.9%	75.1%	100.0%	90.8%	91.7%	81.0%	88.8%	88.7%	94.5%	80.4%	80.7%	89.1%
2008-2010	*81.8%*	*78.5%*	*59.0%*	*89.3%*	*91.3%*	*79.8%*	*85.7%*	*86.7%*	*92.8%*	*84.8%*	*71.4%*	*88.7%*
Mumps	**15722**	**7902**	**6**	**1712**	**1093**	**1048**	**633**	**889**	**593**	**549**	**899**	**393**
2011	88.8%	83.6%	100.0%	96.7%	95.5%	91.5%	96.9%	94.1%	98.2%	86.6%	96.3%	97.0%
2008-2010	*90.6%*	*86.8%*	*79.5%*	*95.9%*	*96.2%*	*92.6%*	*95.9%*	*93.5%*	*97.4%*	*91.8%*	*93.8%*	*96.4%*
Rubella	**15717**	**7898**	**6**	**1711**	**1093**	**1048**	**633**	**889**	**593**	**549**	**899**	**393**
2011	88.8%	83.5%	100.0%	96.6%	95.5%	91.5%	96.9%	94.1%	98.2%	86.6%	96.3%	97.0%
2008-2010	*90.7%*	*86.8%*	*79.5%*	*95.9%*	*96.4%*	*92.6%*	*95.9%*	*93.5%*	*97.3%*	*91.9%*	*94.1%*	*96.6%*
Varicella	**598**	**298**	**0**	**58**	**31**	**31**	**27**	**35**	**47**	**13**	**36**	**22**
2011	3.4%	3.2%	0.0%	3.3%	2.7%	2.7%	4.1%	3.7%	7.8%	2.1%	3.9%	5.4%
2008-2010	*0.9%*	*1.0%*	*0.0%*	*0.5%*	*0.8%*	*0.8%*	*0.7%*	*0.6%*	*0.4%*	*0.7%*	*0.7%*	*0.8%*
Men C-C	**2095**	**886**	**1**	**230**	**137**	**128**	**94**	**143**	**113**	**71**	**202**	**89**
2011	11.8%	9.4%	16.7%	13.0%	12.0%	11.2%	14.4%	15.1%	18.7%	11.2%	21.6%	22.0%
2008-2010	*2.6%*	*3.0%*	*0.0%*	*2.2%*	*2.1%*	*1.6%*	*2.6%*	*2.2%*	*1.6%*	*1.2%*	*2.3%*	*2.7%*

Pneumococcal Polysaccharide Vaccine (Pneu-P- 23)

Pneumococcal Polysaccharide Vaccine (Pneu-P--23) provides protection against illness caused by 23 of the most common serotypes of *Streptococcus pneumoniae* (pneumococcus). Pneumococcus can cause bacterial infections such as bacterial pneumonia and meningitis. These invasive diseases are most common in the very young, the elderly and in certain specific groups with high risk medical conditions[1].

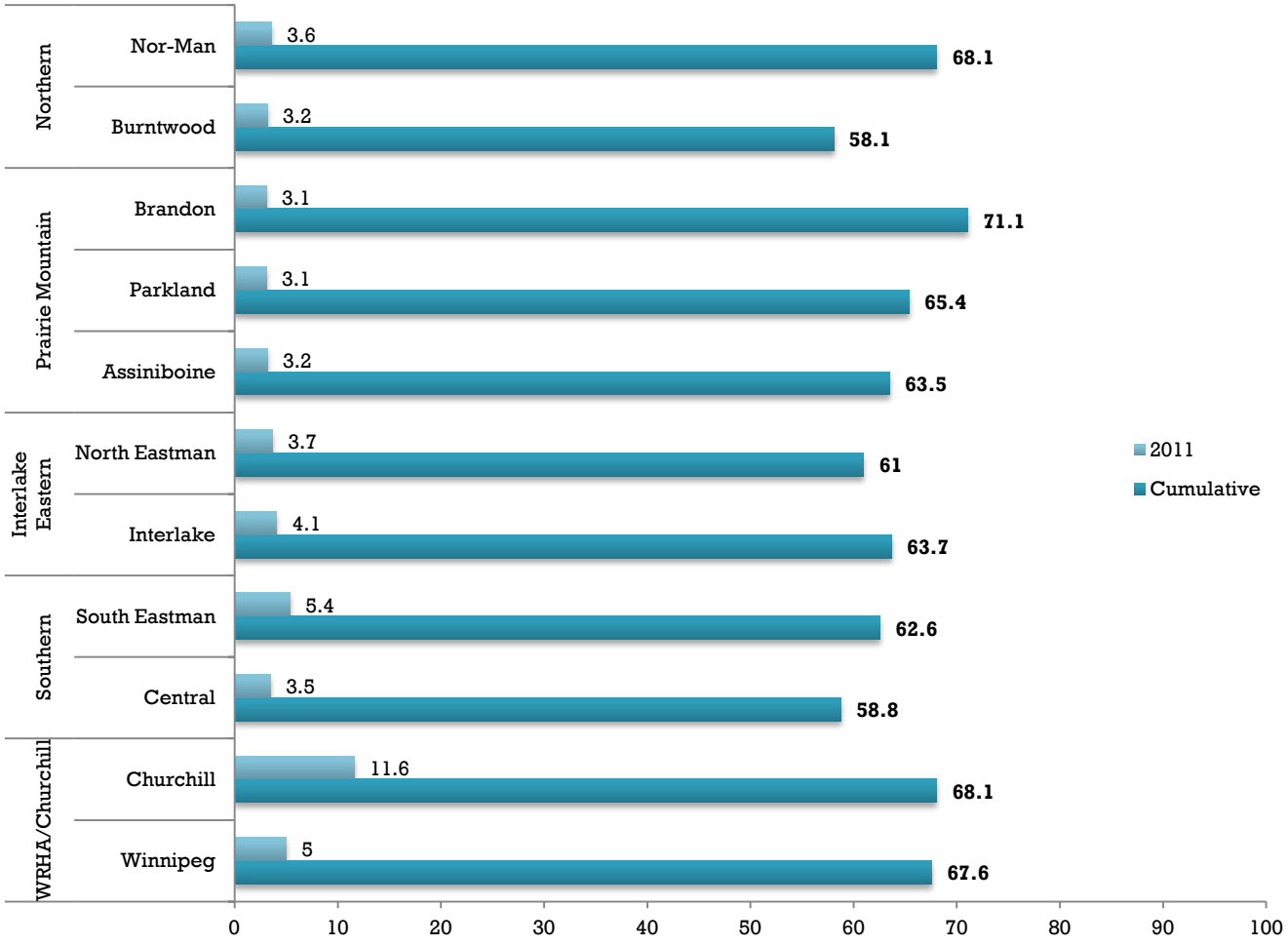
Various provider types administer the Pneu-P-23 vaccination. Physicians are the primary providers in four of the RHAs (Winnipeg, Central, South Eastman, and Brandon). In Burntwood RHA, over half of the vaccines are provided through the Tribal Council and about 40% are given by Public Health Nurses. In Churchill RHA, all of the vaccines are provided by Public Health Nurses. This is similar in Nor-Man RHA where slightly more than 90% of the vaccines are also given by Public Health Nurses. The Public Health Nurses in North Eastman and Assiniboine RHAs administer the vaccine more frequently than any other provider type in those RHAs. The Interlake region has a range of Pneu-P-23 immunization providers, and physicians and public health nurses gave similar proportions of the vaccine in 2011.

A single dose of pneumococcal polysaccharide vaccine is recommended for all individuals over 65 years of age. Manitoba Health reports the percentage of individuals who have received Pneu-P-23 in 2011. Additionally, since one dose of Pneu-P-23 is sufficient for lifetime coverage against pneumococcal infection, Manitoba Health also reports the percentage of all people who have received the vaccine over time (cumulative percentage) because the people who were vaccinated in previous years are still adequately covered in 2011. The cumulative percentage is important when considering overall population coverage.

MIMS requires one of three reason codes when manually entering the tariff code for Pneu-P-23[2]. The options are "High Risk", which includes all individuals who fall under the high risk criteria for the publicly funded program; "No Risk" and "Outbreak". Not surprisingly, the majority of Pneu-P-23 vaccines are coded as "High Risk". In Manitoba in 2011, no doses were given for an Outbreak. Immunizations given by physicians are uploaded from the physician billing system, and do not include information about the individual's risk status. It is important to consider the regional program differences in order to fully understand the variation in immunization providers seen between RHAs.

[1] More information on Pneu-P-23 available at http://www.wrha.mb.ca/professionals/influenza/files/Vaccine_Pneumo23.pdf
[2] MIMS User Manual, pages 123-124. Available at http://www.gov.mb.ca/health/publichealth/surveillance/mims/docs/usermanual.pdf#page=122

Figure 46: Percentage of Adults Over 65 Years that have received Pneu-P-23



Appendix A: Recommended Immunization Schedules

Infants and Pre-School Children

Vaccine	2 months	4 months	6 months	12 months	18 months	4-6 years
Diphtheria, Tetanus, Pertussis, Polio, Haemophilus influenzae type b (DTaP-IPV-Hib)	♦	♦	♦		♦	
Pneumococcal Conjugate 13 valent (Pneu-C-13)	♦	♦	♦		♦	
Varicella (V)				♦		
Measles, Mumps, Rubella (MMR)				♦		♦
Meningococcal C Conjugate (Men-C-C) Vaccine				♦		
Diphtheria, Tetanus, Pertussis, Polio (DTaP-IPV)						♦
Influenza (Flu)	The seasonal influenza program may vary each year.					

School Immunization Schedule

Vaccine	Grade 4	Grade 6	14-16 years
Meningococcal C Conjugate (Men-C-C) Vaccine *	♦		
Hepatitis B Vaccine	♦♦♦		
Human Papillomavirus (HPV)		♦♦♦ **Girls only**	
Tetanus, Diphtheria, Pertussis (Tdap)			♦
Influenza (Flu)	**The seasonal influenza program may vary each year.**		

Immunization Schedule for Adults

Vaccine	18-26 years	All adults	65 years
Tetanus, Diphtheria (Td)		♦ **Every 10 years**	
75Pneumococcal Polysaccharide (Pneu-P-23)			♦
Influenza (Flu)	**The seasonal influenza program may vary each year.**		

♦ A single dose given with one needle.

* Children in Grade 4 are offered a single dose until 2017, at which point this Grade 4 Program will be discontinued