



# Childhood Immunization in PEI

Prince Edward Island Childhood Immunization Program



2017



Report prepared by the Prince Edward Island Provincial Immunization Committee  
Chief Public Health Office  
July 2017

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## Introduction

Immunization is a cornerstone of public health practice and one of the most effective measures for protecting children and adults against vaccine preventable diseases (VPD). Over the past 50 years, the use of vaccines has prevented life threatening disease, disability, certain cancers and hospitalizations. In comparison to the pre-vaccine era, Canada has seen a 95% reduction in many communicable diseases such as German measles, red

### *What is a vaccine?*

*A vaccine contains antigens that induce an immune response in the body that will help the immune system recognize the antigen or disease agent in the future and have antibodies ready to attack the disease.*

measles, diphtheria, tetanus, and haemophilus influenzae type b. Other diseases such as polio and smallpox have been eliminated. Effective vaccines are now available to prevent meningococcal and pneumococcal disease, varicella, and cancers related to human papilloma virus infection.

The goal of the Prince Edward Island's (PEI) Immunization Program is to provide safe and effective vaccines to protect the population against VPDs. Most immunizations are publicly funded and are provided according to a schedule for infants, children, adolescents and adults. Included in these schedules are immunizations for individuals with particular medical conditions

and risk factors.

Immunization protects both individuals and families as well as the entire population by creating “herd immunity”, making it difficult for disease to spread from person to person. When immunization rates fall below a critical level, outbreaks of VPDs including measles, pertussis or meningococcal disease may occur. Therefore, immunization rates are important indicators for population health and health system performance.

This report describes PEI's Childhood Immunization Program (children under 18 years of age) and presents children's immunization rates at three critical points in time: by two years; prior to Grade 1 entry; and school-based immunization.

## Childhood Immunization in PEI

Immunization was introduced in PEI starting with the diphtheria and smallpox vaccine in the 1930s. Today, children in PEI are immunized against 15 different VPDs including polio, pertussis (whooping cough) measles, hepatitis B, meningococcal disease, and varicella (chicken pox).

The Chief Public Health Office (CPHO) is responsible for determining [PEI's immunization schedule](#) based on recommendations made by the National Advisory Committee on Immunization (NACI). The CPHO, in partnership with Health PEI's Public Health Nursing, nurse practitioners, physicians, pediatricians, and obstetricians provides the best available information to help parents make informed immunization decisions for their children. Public health nurses introduce the childhood immunization program during pregnancy to parents who attend pre-natal classes and/or during early post-partum home visits. Public health nurses and others including the CPHO, pediatricians and family physicians, counsel parents who may be hesitant about childhood immunization.

# Childhood Immunizations

A history of immunizations and vaccinations on PEI...

## Small Pox Vaccine

The Small Pox vaccine becomes available for children in 1928. Diphtheria toxoid is introduced the same year, but doesn't grow to cover all infants and children until the late 1930s.

## Polio Vaccine

In 1955 the polio vaccine is offered to most Islanders between 3 months and 20 years of age, and pregnant women. It is now administered in a combination vaccine for 2, 4, and 6 month old infants, and 4 year old children.

## MMR Vaccine

The Measles, Mumps, and Rubella (MMR) vaccine becomes available in 1972.

## Hepatitis B Vaccine

The hepatitis B vaccine is introduced in the fall of 1995 to Grade 3 students. It is now administered in a combination vaccine at 2, 4, and 6 months.

## Meningococcal Vaccine

The meningococcal vaccine is made available in 2003 for 12 month old children and Grade 9 students. In 2006 the meningococcal quad vaccine is introduced to Grade 9 students.

## HPV Vaccine

The Human Papillomavirus vaccine is introduced for Grade 6 girls in 2007. It is made available for Grade 6 boys in 2013.

1930

1940

1950

1960

1970

1990

2000

2003

2005

2007

2010

## Tetanus Vaccine

The tetanus vaccine is introduced in PEI in the 1940s. It is now available as a combination vaccine with the pertussis vaccine.

## Measles Vaccine

The measles vaccine becomes available on PEI in 1966/67

## HiB Vaccine

The *haemophilus influenzae* type b vaccine is introduced for children aged 15 - 18 months in 1990. It is currently available as a combination vaccine given to children at 2, 4, 6, and 18 months.

## Varicella Vaccine

The first dose of the varicella vaccine is introduced in 2000. A second dose is made available in 2010.

## Pneumococcal Vaccine

The pneumococcal vaccine is administered to children up to 59 months of age and any child considered to be 'high risk'. In 2005 it is made available to children at 2, 4, 6, and 18 months of age.

## Rotavirus Vaccine

The rotavirus vaccine becomes available in 2010 for 2 and 4 month old infants.

Immunizations are administered by public health nurses during well-baby clinics, toddler and pre-school assessments and in schools. All childhood immunizations are recorded in an electronic provincial immunization registry and reported to the CPHO as required by the PEI [Public Health Act](#) and [Immunization Regulations](#).

The current schedule for children and students is shown in the following table:

Immunization Schedule for Children and Students								
	2 Months	4 Months	6 Months	12 Months	18 Months	4 - 5 Years	Grade 6	Grade 9
DTap	✓	✓	✓		✓			
HB	✓	✓	✓					
HiB	✓	✓	✓		✓			
IPV	✓	✓	✓		✓	✓		
Pneumococcal Conjugate	✓	✓	✓*	✓				
Rotavirus vaccine (oral)	✓	✓						
MMRV				✓	✓			
Meningococcal C Conjugate				✓				
Tdap						✓		✓
Varicella						✓**		
HPV							✓	
Meningococcal A, C Conjugate, Y, and W-135 Conjugate								✓

**DTap** = Diphtheria, Tetanus, Acellular Pertussis

**HB** = Hepatitis B

**HiB** = *Haemophilus influenzae* type-B

**IPV** = Inactive Polio

**MMRV** = Measles Mumps, Rubella (German Measles) and Varicella (Chickenpox)

**Tdap** = Tetanus, Diphtheria, Acellular Pertussis

**HPV** = Human Papillomavirus

\* High risk only receive 6-month Pneumococcal Conjugate

\*\* Varicella if the child has not had two doses

## Infant and Preschool Immunization Program

Generally children receive their first vaccines at age two months in order to be protected against VPDs although there would be rare instances when a newborn would be immunized at birth. Babies receive some temporary immunity from their mothers after birth and through breastfeeding, but as they are susceptible to diseases at a young age and the consequences of VPDs can be very serious, it is important to start the immunization process early. By 18 months of age the infant will have been immunized with the following antigens: diphtheria, tetanus, pertussis, hepatitis B, polio, *Haemophilus influenzae* type B, rotavirus, pneumococcal disease, measles, mumps, rubella and varicella, and meningococcal disease.

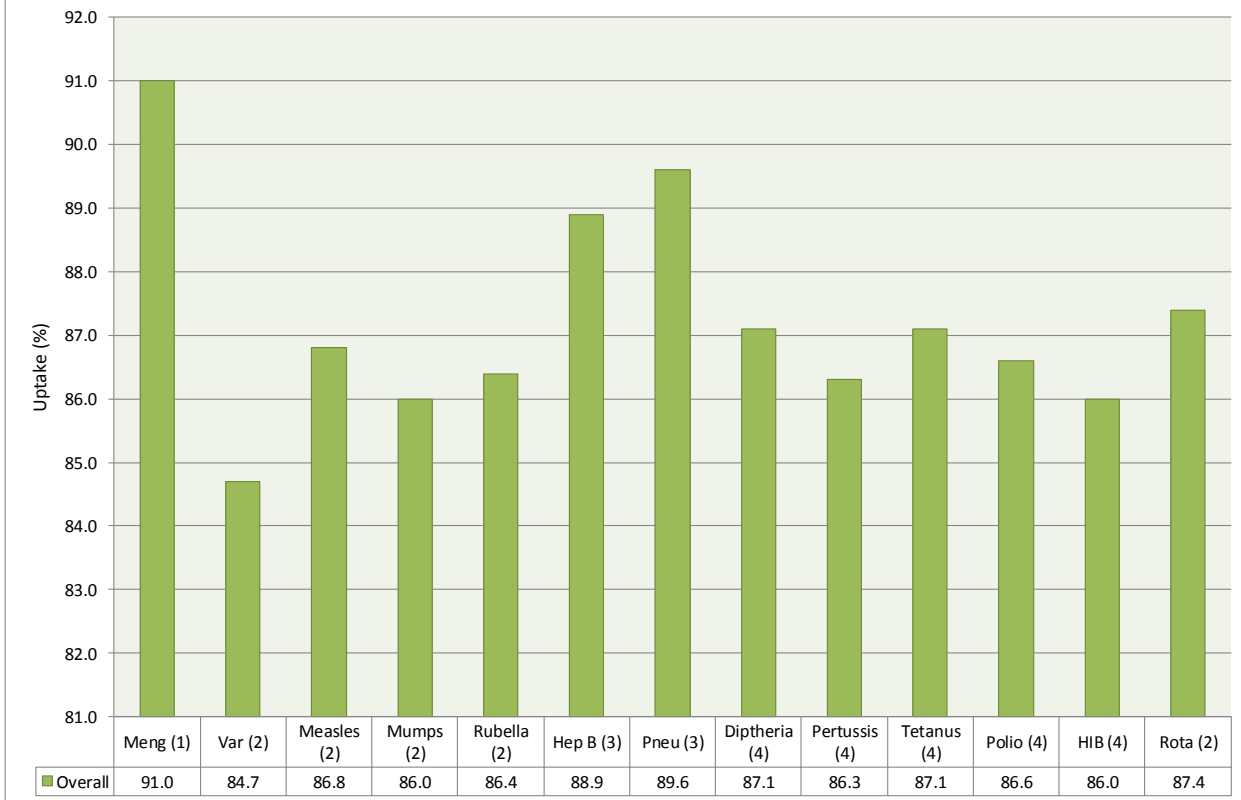
### Methodology

Data from Integrated Services Management (ISM), which houses the electronic immunization records, and Medicare were used to establish the correct birth cohort for analysis. Children who had moved away from PEI or who were deceased based on their Medicare file were removed from the analysis. Children who moved to PEI and children who were born off of PEI but received a PEI Health Card within 60 days of birth were included in the analysis. Records that were only found in Medicare or ISM but not in both datasets were manually reviewed.

The PEI immunization schedule for this cohort was determined using the current immunization schedule and the vaccine history file. By age two, each child should have had a total of 12 vaccines containing 13 different antigens: diphtheria (four doses), tetanus (four doses), polio (four doses), pertussis (four doses), *Haemophilus influenzae* (four doses), pneumococcal conjugate (three doses), measles (two doses), mumps (two doses), rubella (two doses), varicella (two doses), hepatitis B (three doses), meningococcal C (one dose), and rotavirus (two doses).

All vaccines administered between the child's date of birth and the day prior to their second birthday were considered eligible and were included in the analysis. All vaccine records that contained "missing information" were investigated manually to determine the reason for the missing value.

### Immunization Uptake by Antigen by Age Two, 2013 Cohort



Based on the 2005 National Consensus Conference for Vaccine-Preventable Diseases in Canada, PEI met the the national immunization coverage targets for varicella (85%) and Invasive Pneumococcal Disease (IPD) (90%) but fell short of reaching the target for rubella (97%), Invasive Meningococcal Disease (IMD) (97%) and pertussis (95)<sup>1</sup>. These national targets are scheduled to be reviewed in the near future to reflect current immunization programs and disease epidemiology.

Timely assessment of immunization status and scheduling of appointments for catch-up of children who move to PEI is important in order to maintain a strong herd immunity for the population of PEI as a whole.

<sup>1</sup> Public Health Agency of Canada. Final Report of Outcomes from the National Consensus Conference for Vaccine-Preventable Diseases in Canada. CDR 2007;33S3:1-56.



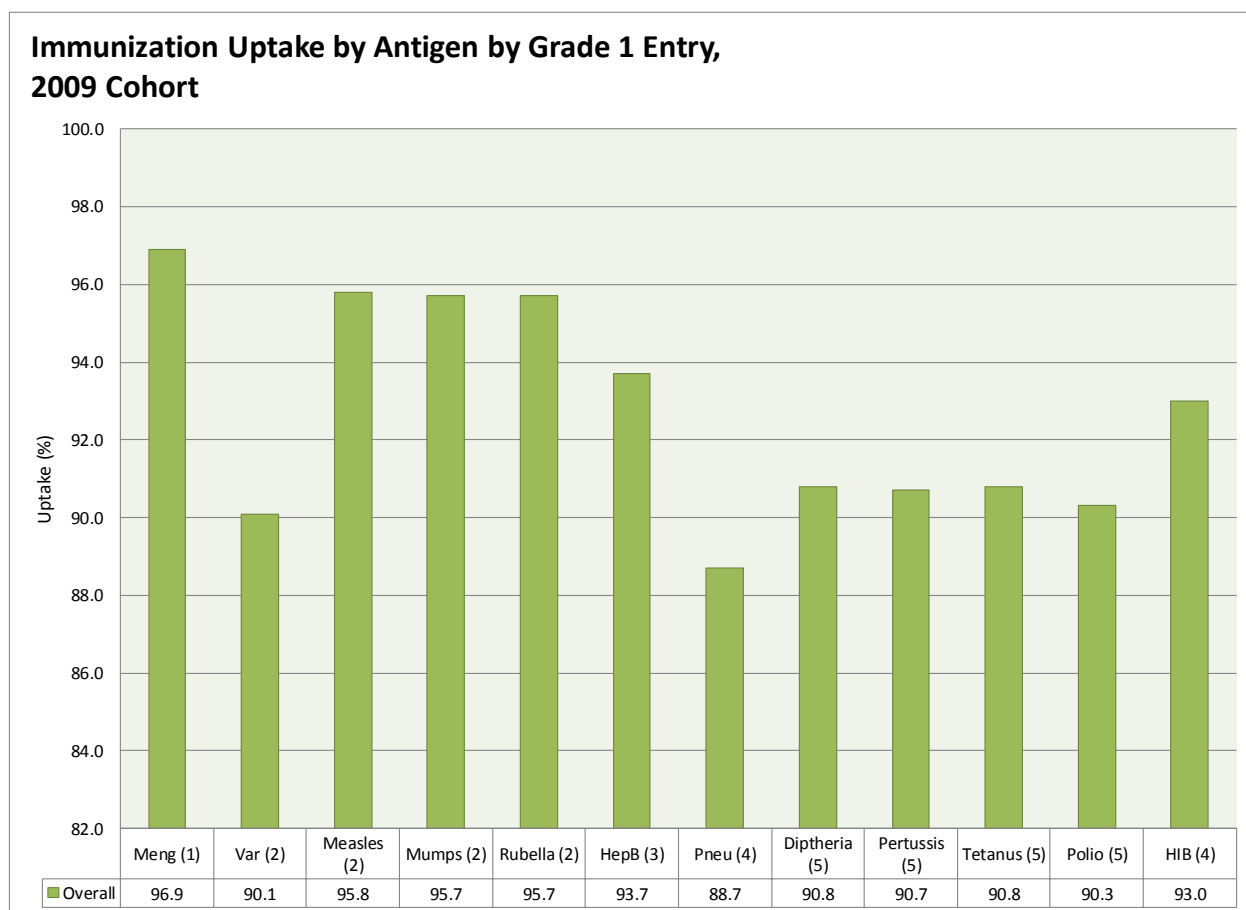
## Immunization Uptake by Grade One Entry

Booster doses of vaccines are administered between the ages of four and five years prior to school entry for diphtheria/tetanus, pertussis, polio, and varicella (if the child has not previously received two doses).

### Methodology

Data from Medicare, ISM, school boards and private schools were used to establish a master school data set containing PEI students in Grade one in the 2015/16 school year. Children who are home schooled were removed from the analysis. Records that were only found in one dataset were manually reviewed.

The PEI immunization schedule for this cohort was determined using the current immunization schedule and the vaccine history file. Each child should have a total of 13 vaccines (containing 12 different antigens: diphtheria (five doses), tetanus (five doses), polio (five doses), pertussis (five doses), *Haemophilus influenzae* (four doses), pneumococcal conjugate (four doses), measles (two doses), mumps (two doses), rubella (two doses), varicella (two doses), hepatitis B (three doses) and meningococcal C (one dose) prior to Grade one entry (September 7, 2015).



Based on the 2005 National Consensus Conference for Vaccine-Preventable Diseases in Canada, PEI exceeded the national immunization coverage target for varicella (85%) but fell short of reaching those for pertussis

(95% by age seven) and rubella (97%)<sup>2</sup>. These national targets are scheduled to be reviewed in the near future to reflect current immunization programs and disease epidemiology.

It is important to note that across the country this indicator is measured at varying age points. PEI determined that children should have their childhood boosters before they enter Grade one. Some children enter Grade one at five years of age and may not complete this immunization series until six years of age as was routine in previous years. As the earlier vaccine schedule becomes more practiced, the overall indicator should improve.

Timely assessment of immunization status and scheduling of appointments for catch-up of children who move to PEI is important in order to maintain a strong herd immunity for the population of PEI as a whole.

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<sup>2</sup> Public Health Agency of Canada. Final Report of Outcomes from the National Consensus Conference for Vaccine-Preventable Diseases in Canada. *CCDR* 2007;33S3:1-56.

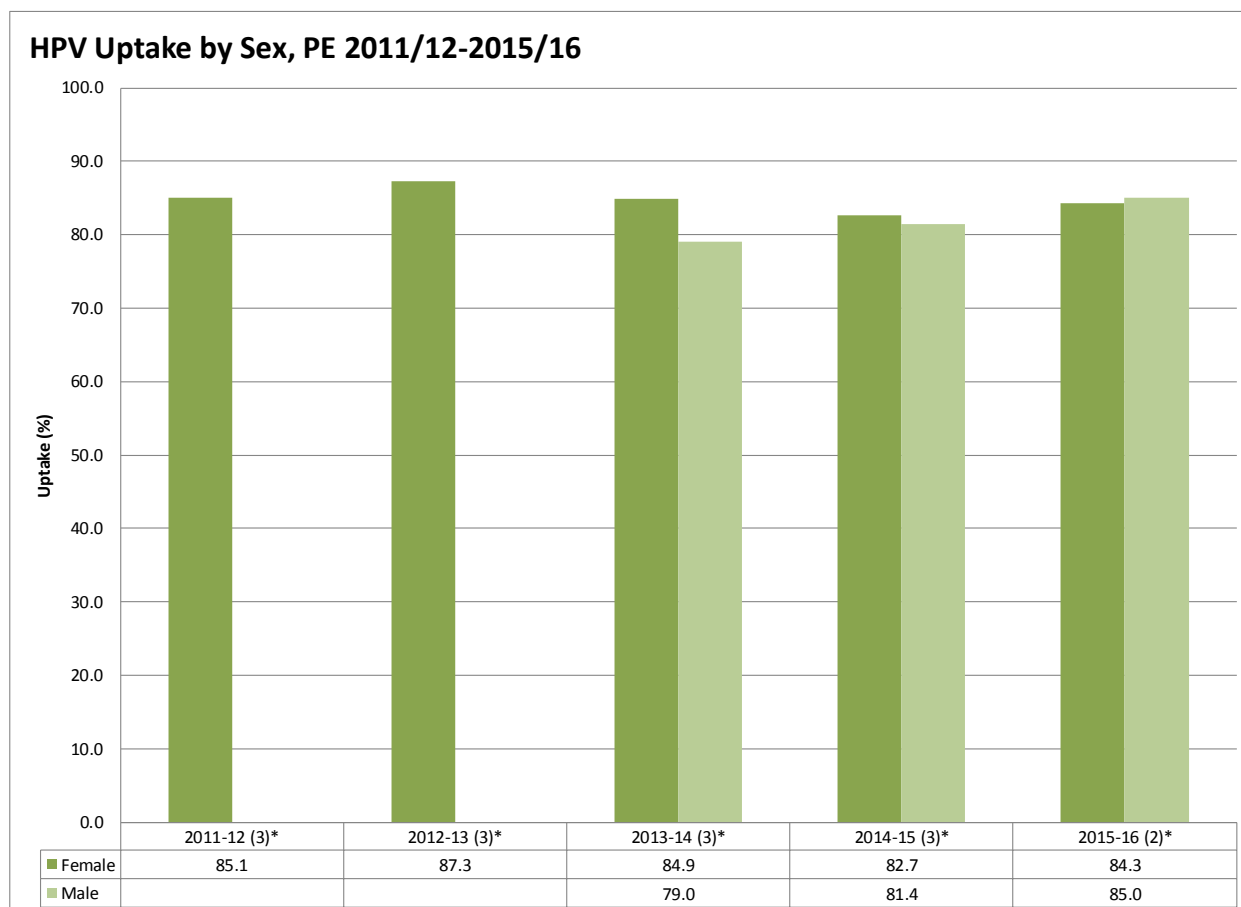
## School Immunization Program

Immunization is provided by Public Health Nursing in the schools to adolescents in grades six and nine. The grade six students receive two doses of HPV vaccine. The final boosters for diphtheria, tetanus, and pertussis (Tdap) and meningococcal ACYW-135 are administered in grade nine.

### Methodology

Data from ISM, school boards and private schools were used to establish a master school data set containing PEI students in Grades six and nine in the 2015/16 school year. Children who are home schooled were not included. Records that were only found in one dataset were manually reviewed. All vaccines that had “missing” data were investigated manually if they had a value in the vaccine status field.

### HPV

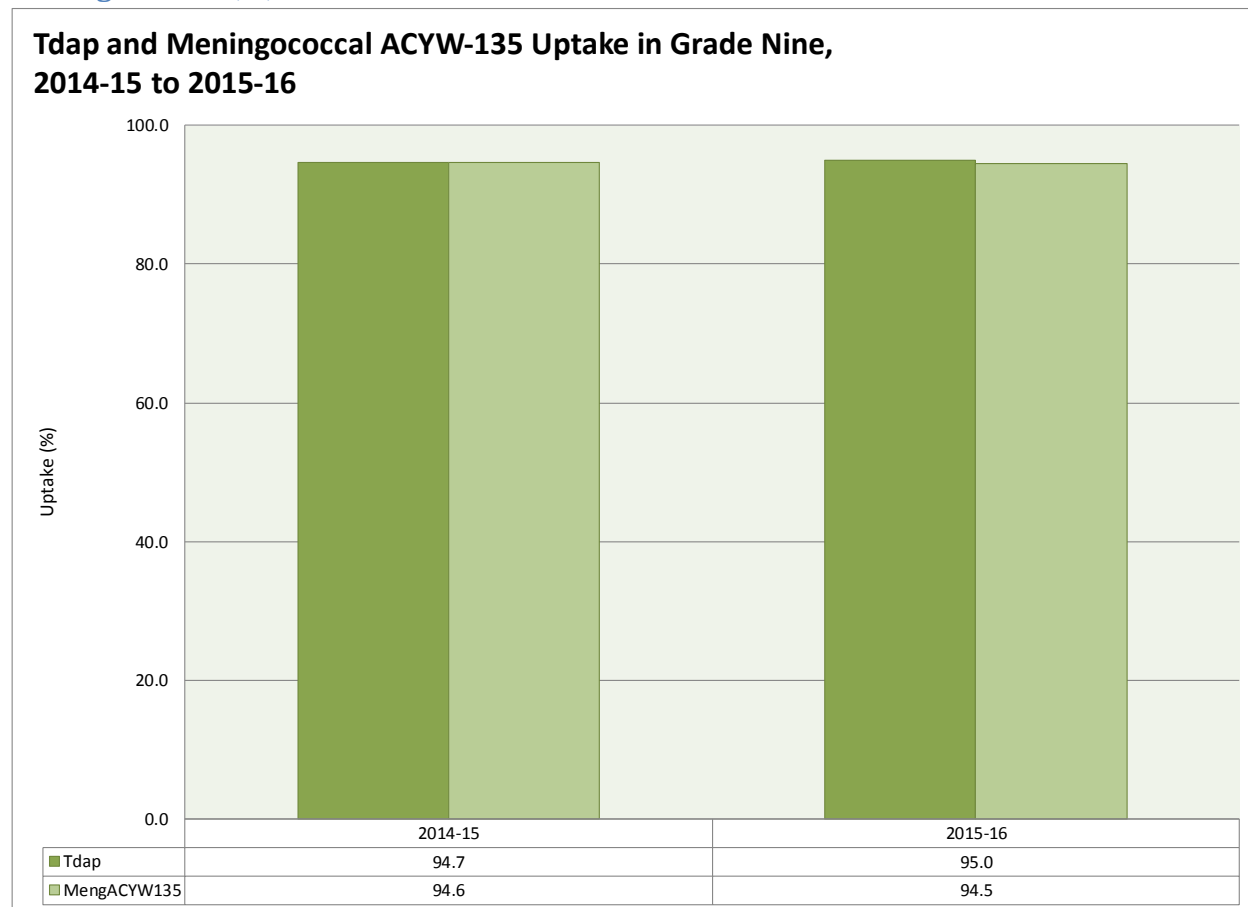


\*(#)Number of doses required

During the 2015-16 school year 84.7% of Grade six students received two doses of HPV vaccine as per the current recommended vaccine schedule. This was the first year that PEI reduced its requirement from three to two doses in Grade six as per NACI recommendations. Since the introduction of HPV immunization for males in Grade six in September 2013, the uptake for males has improved and in the 2015-16 school year there were no differences between males and females.

## Diphtheria, Tetanus, acellular Pertussis

### Meningococcal A, C, Y& W-135



During the 2015-16 school year 95.0% of Grade nine students received their Tdap vaccine booster and 94.5% received their MengACYW-135. This high uptake was also seen in 2014-15.

## Conclusion

Publicly funded immunization programs have been effective at preventing diseases that would otherwise cause illness and death in our communities. Many diseases that were once common and devastating in Canada have now been eliminated or drastically reduced.

PEI has been a leader in immunization, achieving vaccination rates that are higher than the Canadian average for most publicly-funded children's vaccines. A contributing factor to this success is PEI's longstanding childhood immunization service delivery model by Health PEI Public Health Nursing (PHN) in partnership with the Chief Public Health Officer (CPHO). This has resulted in a high quality and accessible childhood immunization program with skilled and knowledgeable staff and a good understanding by the public of the importance of immunization.

All immunizations administered in PEI are required by legislation to be reported to the CPHO and childhood immunizations are recorded electronically by PHN in a single database. This provides a high degree of confidence in the immunization rates presented in this report. Vaccine coverage is further evident by the consistently low rate of lab-confirmed and clinical vaccine preventable diseases (VPDs) in PEI which are reportable under the *Public Health Act* Notifiable Diseases and Conditions and Communicable Diseases Regulations. Immunization rates for some vaccines are lower than the National targets, however, which may place individuals and certain populations at risk for VPDs. These varying rates may be related to factors including:

- differences in vaccine schedules of other provinces and countries which results in children who move to PEI potentially being categorized as under-immunized;
- timeliness of immunization appointments;
- vaccine hesitancy, defined by the World Health Organization as a behaviour, influenced by factors including issues of confidence, complacency, and convenience.

Enhancing immunization programs to prevent the spread of VPDs is in alignment with the National Immunization Strategy to address vaccination coverage and vaccine hesitancy and has been identified as a key priority in [PEI's Chief Public Health Office Strategic Plan \(2016-2018\)](#). This report provides evidence to inform targeted public health interventions aimed at under-immunized populations in PEI.