

Immunization Coverage Report for School Pupils in Ontario

2017–18 School Year



Technical Report
May 2019

Public Health Ontario

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Immunization Coverage Report for School Pupils in Ontario: 2017–18 School Year

Published: May 2019

This document is current to February 2020. New material in this revision is summarized below.

Summary of Revision:

Revision number	Revision date	Description of change	Page
001	February 2020	Medical immunization exemptions (%) for Diphtheria in 17-year-olds from 2013-14 to 2015-16 has been corrected (Appendix 4, Table 2).	39

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Key Messages

Immunization coverage among school pupils varies by vaccine, age and health unit.

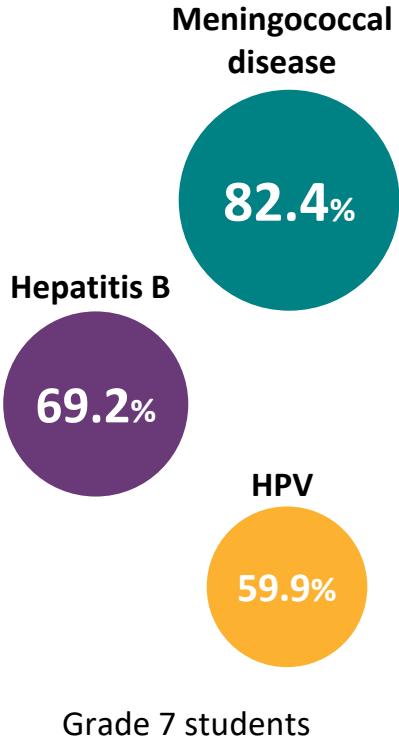
Coverage estimates are dependent on the information recorded in the provincial immunization repository. Not all immunizations given to children may be captured in this system, which may result in underestimates of coverage.

For most antigens, provincial-level coverage estimates do not meet Canada’s national coverage goals. However, some health units have local coverage estimates that surpass the national goals.

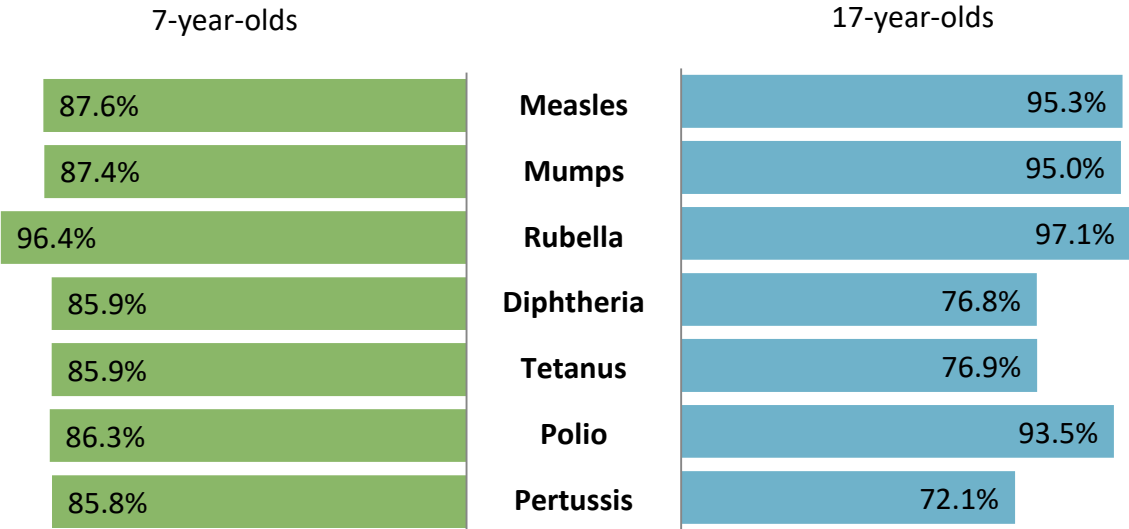
Many children who are not up-to-date have received some, but not all, recommended doses in a vaccine series.

The overall proportion of students registering exemptions to immunizations is relatively low; however, geographical clustering of exemptions is evident at the health unit level.

Provincial immunization coverage for school-based programs



Provincial immunization coverage for select diseases



Introduction

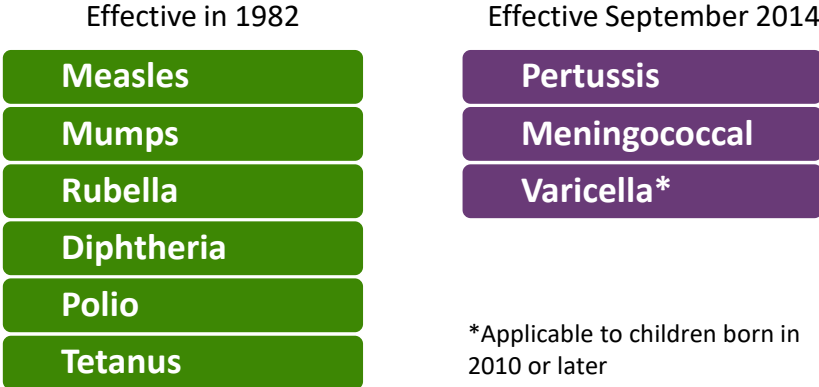
Immunization coverage refers to the proportion of a population that is appropriately immunized against a vaccine-preventable disease (VPD) at a point in time. This report presents the results of Public Health Ontario (PHO)'s 2017–18 school year assessment of immunization coverage for school pupils in Ontario.

Achieving and maintaining high immunization coverage is essential for the effective prevention and control of VPDs. Accurate and timely immunization coverage assessment is essential to evaluate immunization programs, predict population-level susceptibility to VPDs and identify sub-populations with inadequate coverage that may be at risk of VPD outbreaks. The [Canadian National Standards for Immunization Coverage Assessment](#) recommend that antigen-level coverage should be reported annually for 2-, 7- and 17-year-olds, as well as for school-age programs.¹

In Ontario, [publicly-funded immunization programs](#) are available for healthy infants, children, adolescents and adults, as well as high-risk individuals with particular medical conditions, behavioural risk factors or high-risk exposures.² Vaccines administered to infants and young children are predominantly delivered by community-based primary health care providers, while adolescent vaccines are largely delivered by public health units (PHUs) through school-based immunization programs.

Ontario's *Immunization of School Pupils Act (ISPA)*^{3,4} directs Medical Officers of Health (MOHs) of public health units (PHUs) to maintain a record of immunization for each pupil attending school in their jurisdiction. Students can be suspended if they do not receive immunizations against *ISPA*-designated diseases or if documentation of a medical exemption or religious/conscientious (also referred to as non-medical) exemption is not provided.^{3,4} Additionally, un-immunized and under-immunized students can be excluded from school if there is an outbreak or immediate risk of an outbreak of an *ISPA*-designated disease. Additionally Ontario's *Child Care and Early Years Act (CCYEA)*^{5,6} requires daycare operators to receive proof of immunization for children who are enrolled in child care programs.

Figure 1. Designated diseases under the ISPA for the 2017–18 school year



In Ontario, immunization records are maintained by PHUs in the Digital Health Immunization Repository (DHIR). Since the collection of immunization information in Ontario is driven by the *ISPA* and the *CCYEA*, the DHIR does not contain complete information for all immunizations administered to Ontario residents. As such, we are not currently able to provide timely assessments of coverage for children before school-entry, nor are we able to assess coverage among adults.

Scope and Objectives

For this report, we assessed coverage for all publicly-funded routine immunization programs started in infancy through adolescence, with the exception of influenza and rotavirus vaccines.

The objectives of this report are:

- To present provincial, PHU-level and Local Health Integrated Network (LHIN)-level immunization coverage estimates for the 2017–18 school year for Ontario’s publicly-funded childhood immunization programs which include:
 - Immunization programs started in infancy and early childhood: measles, mumps, rubella, diphtheria, tetanus, polio and pertussis for 7- and 17-year-olds; *Haemophilus influenzae* type b, pneumococcal conjugate, meningococcal-C-conjugate (MCC) and varicella for 7-year-olds.
 - School-based immunization programs: hepatitis B, quadrivalent meningococcal conjugate (MCV4) and human papillomavirus (HPV) for 12-year-olds.
- To compare provincial immunization coverage estimates with nationally defined coverage goals, where relevant.
- To describe trends in provincial immunization programs over five school years (since the implementation of Panorama and the DHIR).
- To examine the proportion of 7- and 17-year-old students with non-medical and medical immunization exemptions for diseases designated under the *ISPA*:
 - By each antigen provincially for the 2013–14 through 2017–18 school years.
 - For at least one antigen provincially and by PHU for the 2017–18 school year.

Methods

For a detailed description of the provincial immunization repository (the DHIR) and methods used for the assessment of student immunization and exemption status in this report, including detailed specifications on the number and timing of vaccine doses needed to be considered up-to-date for each antigen and age milestone, please see the [Technical Annex](#) on the PHO Immunization Coverage webpage.

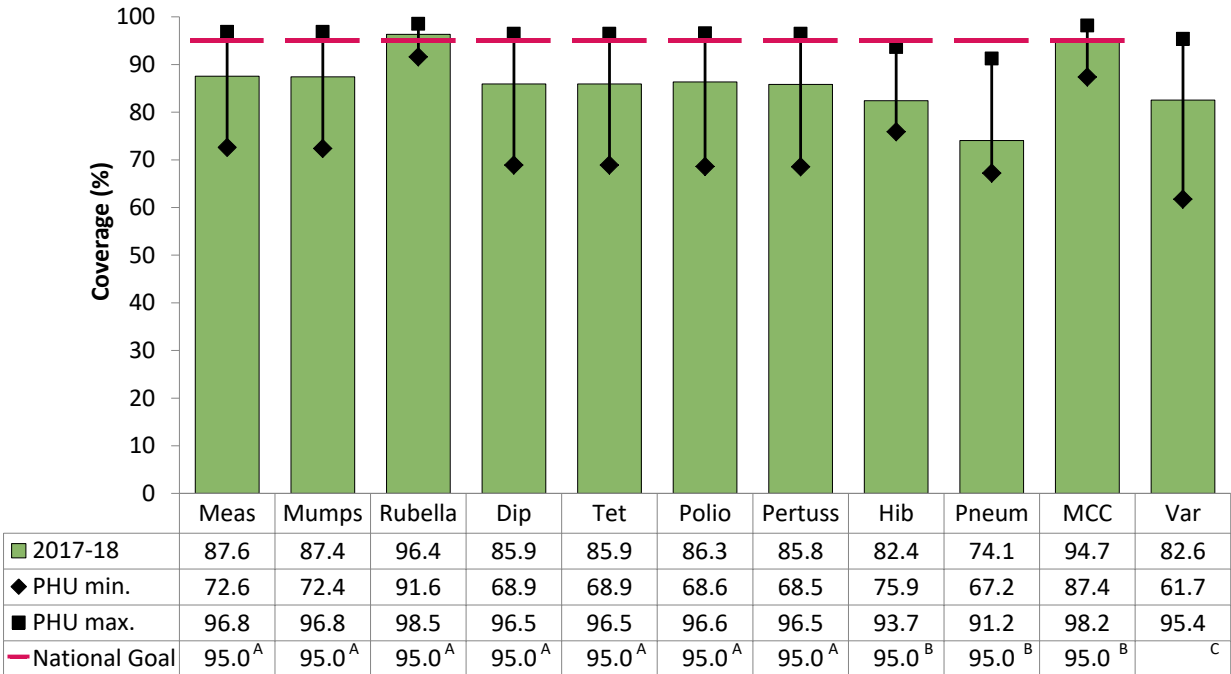
Results

Immunization Coverage for the 2017–18 School Year

7-Year-Olds

Provincial estimates of immunization coverage for publicly-funded childhood immunization programs at age 7 for the 2017–18 school year are presented in [Figure 2](#). Coverage estimates are available by PHU in [Appendix 1](#) and by LHIN in [Appendix 2](#).

Figure 2. Immunization coverage in Ontario among children 7 years old: 2017–18 school year



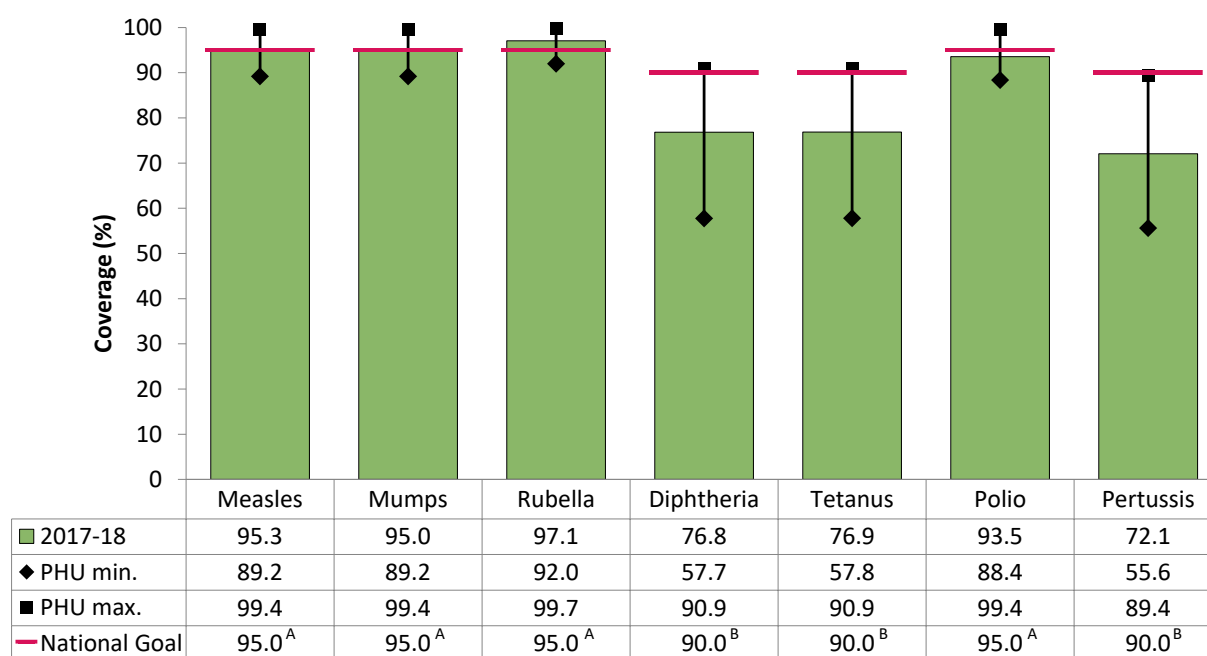
Notes:

- Meas=Measles, Dip=Diphtheria, Tet=Tetanus, Pertuss=Pertussis, Hib=*Haemophilus influenzae* type b, Pneum=Pneumococcal, MCC=Meningococcal C conjugate, Var=Varicella
- Immunization coverage estimates are calculated per the specifications in the [Technical Annex](#).
- National coverage goals are defined as:
 - Achieve 95% vaccination coverage by seven years of age for the following childhood vaccines: five doses of diphtheria, tetanus and pertussis vaccine; four doses of polio vaccine; two doses of measles, mumps and rubella vaccine.
 - Achieve 95% vaccine coverage by two years of age for the following childhood vaccines: four doses of *Haemophilus influenzae* type b (Hib) vaccine; three or four doses of pneumococcal vaccine; one dose of meningococcal C vaccine.
 - There is no coverage goal for two dose varicella coverage. A goal of 95% vaccination coverage by two years of age for one dose of varicella has been established.

17-Year-Olds

Provincial estimates of immunization coverage for publicly-funded childhood immunization programs at age 17 for the 2017–18 school year are presented in [Figure 3](#). Coverage estimates are available by PHU in [Appendix 1](#) and by LHIN in [Appendix 2](#).

Figure 3. Immunization coverage in Ontario among children 17 years old: 2017–18 school year



Notes:

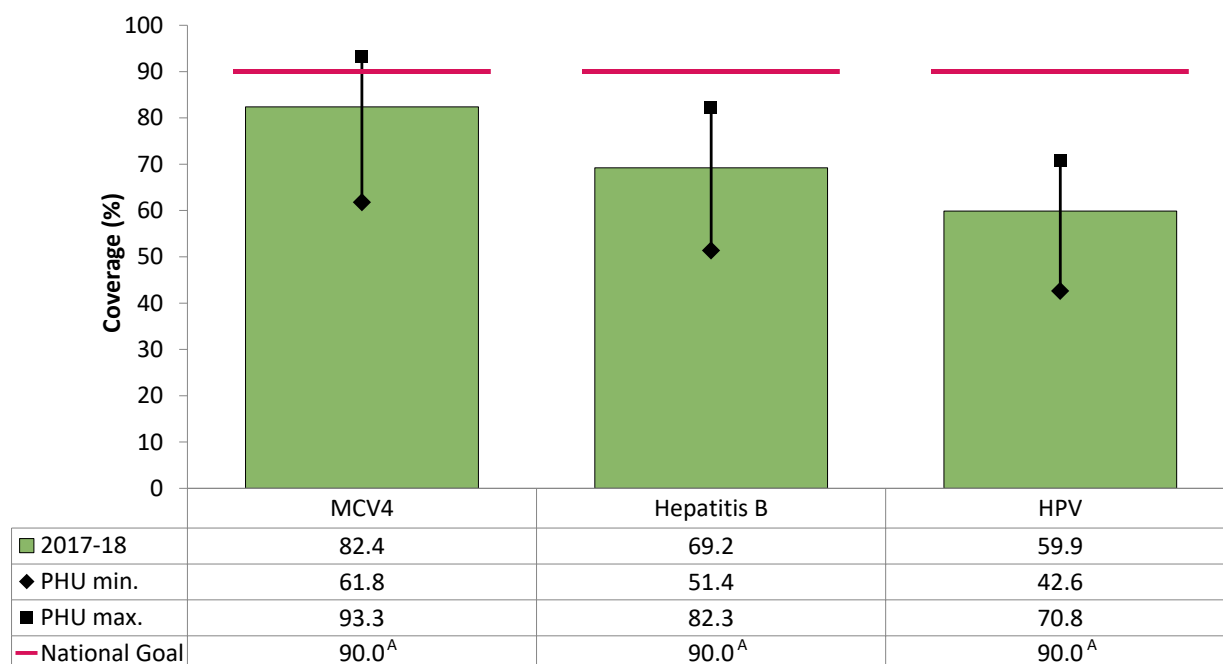
- Immunization coverage estimates are calculated per the specifications in the [Technical Annex](#) of this report.
- National coverage goals are defined as:
 - Achieve 95% vaccination coverage by seven years of age for the following childhood vaccines: four doses of polio vaccine; two doses of measles, mumps and rubella vaccine.
 - Achieve 90% vaccination coverage by 17 years of age for the following adolescent vaccines: one dose of tetanus-diphtheria-pertussis booster vaccine (Tdap) given between 14 and 16 years of age.

School-Based Immunization Programs

Figure 4 presents provincial coverage estimates for the three vaccine series administered to students in Grade 7 through Ontario’s school-based immunization programs in the 2017–18 school year.

Immunization coverage for HPV among 12-year-olds was higher among females at 62.4%, as compared to 57.5% for males (not shown in figure). Coverage estimates are available by PHU in [Appendix 1](#) and by LHIN in [Appendix 2](#).

Figure 4. Immunization coverage in Ontario for school-based immunization programs among children 12 years old: 2017–18 school year

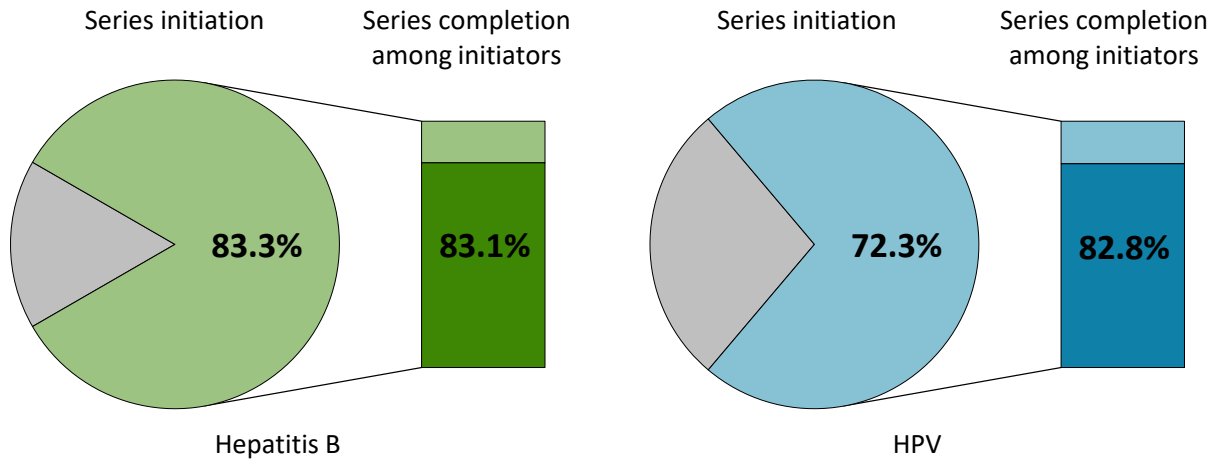


Notes:

- MCV4=Quadrivalent meningococcal conjugate, HPV=Human papillomavirus
- Immunization coverage estimates are calculated per the specifications in the [Technical Annex](#) of this report.
- National coverage goals are defined as:
 - A. Achieve 90% vaccination coverage by 17 years of age for the following adolescent vaccines: one dose of meningococcal vaccine; one or more doses of hepatitis B vaccine; two or more doses of human papillomavirus vaccine (HPV).

Series initiation (the proportion of each cohort who received at least one dose of the vaccine series) and series completion among initiators were assessed for hepatitis B and HPV (Figure 5), but not for MCV4 since it only requires one dose. As seen in Figure 5, although series initiation varied approximately 83% of students who initiated each series went on to complete it.

Figure 5. Series initiation* and series completion among initiators† in Ontario for Hepatitis B‡ and HPV immunization programs among children 12 years old: 2017–18 school years



Notes:

*Received at least one valid dose of the vaccine series.

†Completion of the vaccine series among series initiators.

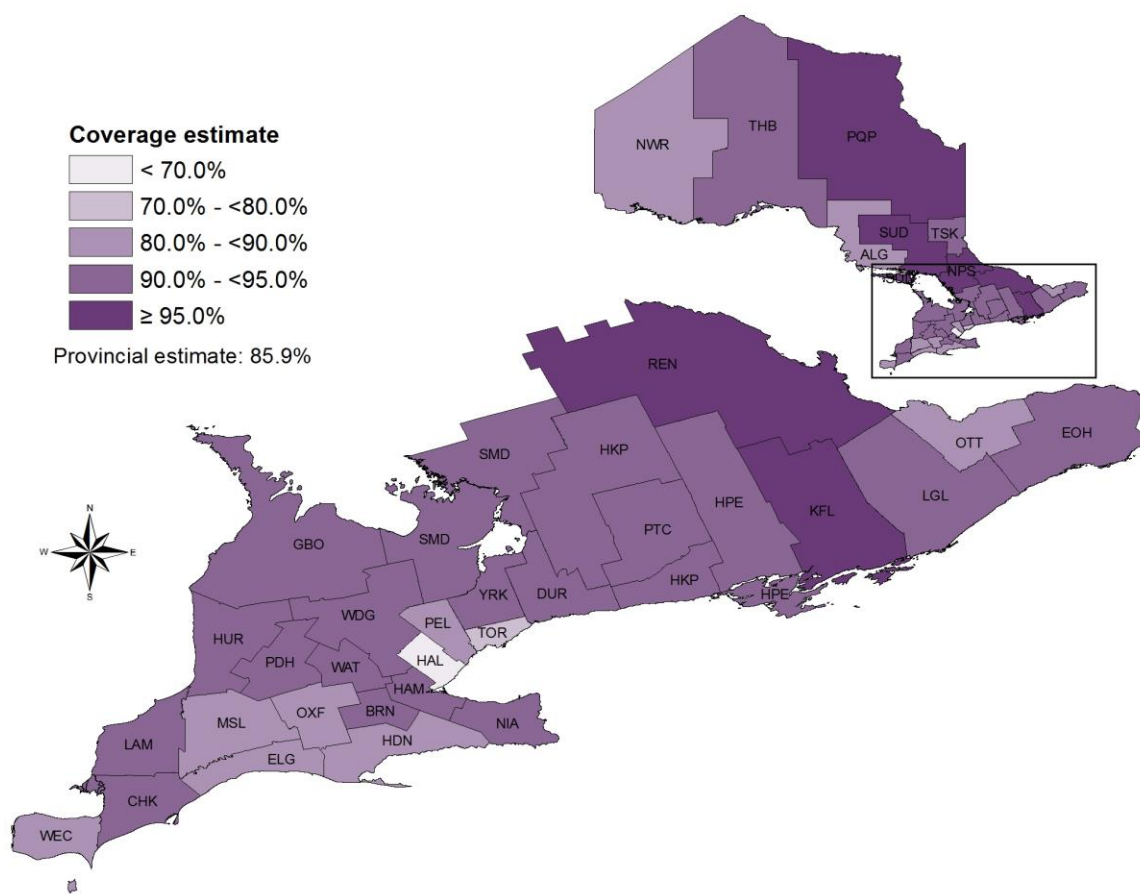
‡ Those with prior immunity to hepatitis B were excluded from calculations of both initiators and completers.

Geographic Distribution

The following maps displayed in [Figure 6](#), [Figure 7](#) and [Figure 8](#) include PHU-specific coverage estimates for select antigen and age cohort combinations for the 2017–18 school year. The categories of coverage estimates vary between maps, as designated in the map legends.

As shown in [Figure 6](#), the geographic distribution of diphtheria coverage estimates among 7-year-olds ranges from 68.9% to 96.5%. The majority of PHUs (91.7%; n=33) met or exceeded the 85.9% provincial coverage estimate for 7-year-olds. PHU-specific coverage estimates for all antigen-age combinations included in this report can be found in [Appendix 1](#).

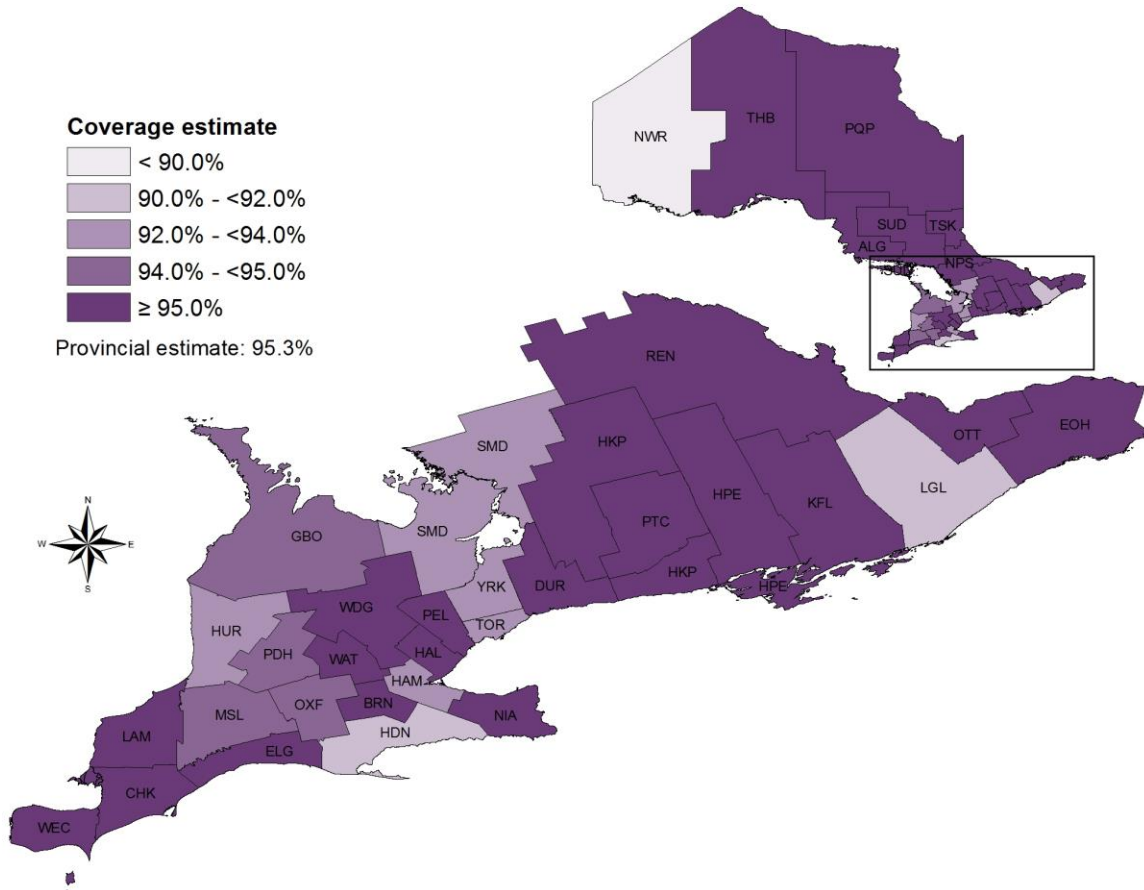
Figure 6. Immunization coverage in Ontario for diphtheria among children 7 years old by public health unit: 2017–18 school year*



*Health unit legend available in [Appendix 3](#).

[Figure 7](#) displays coverage estimates for measles among 17-year-olds by PHU, ranging from 89.2% to 99.4%. The majority of PHUs had estimates exceeding the provincial estimate of 95.3% (66.7%; n=24). PHU-specific coverage estimates for all antigen-age combinations included in this report can be found in [Appendix 1](#).

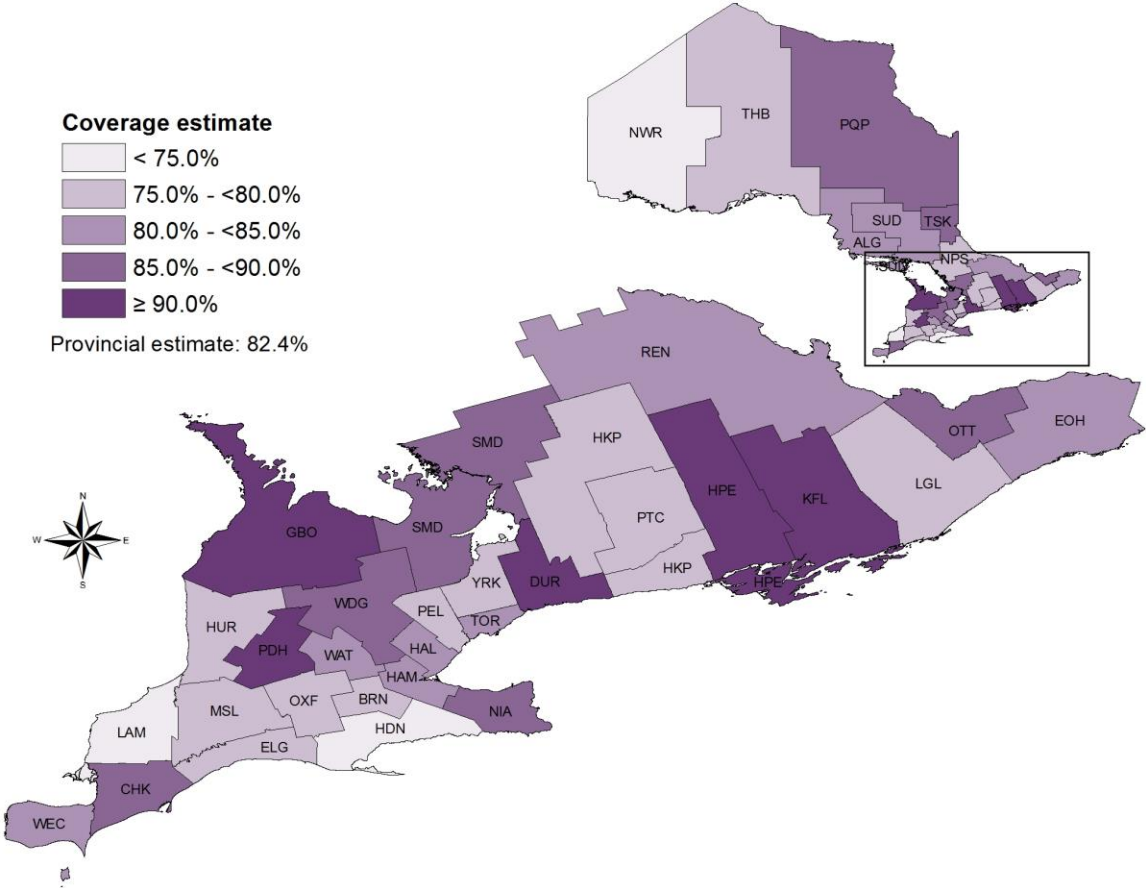
Figure 7. Immunization coverage in Ontario for measles among children 17 years old by public health unit: 2017–18 school year*



*Health unit legend available in [Appendix 3](#).

[Figure 8](#) shows coverage estimates for MCV4 among 12-year-olds. Coverage varied by PHU, with estimates ranging from 61.8% to 93.3%. Just under half of PHUs (47.2%; n=17) met or exceeded the overall provincial coverage estimate of 82.4%. PHU-specific coverage estimates for all antigen-age combinations included in this report can be found in [Appendix 1](#).

Figure 8. Immunization coverage in Ontario for quadrivalent meningococcal conjugate (MCV4) among children 12 years old by public health unit: 2017–18 school year*



*Health unit legend available in [Appendix 3](#).

Temporal Trends

In this section, we present trends over the time period from the 2013–14 school year when the up-to-date methodology was first used. Trends prior to this time period are not directly comparable as complete-for-age methodology was used for coverage assessment. Since our assessment is conducted at the antigen level, antigens included in the same multicomponent vaccines (e.g., measles, mumps and rubella containing-vaccines; diphtheria, tetanus, polio and pertussis-containing vaccines) may have very similar antigen-specific coverage estimates as seen in the overlapping lines in some graphs in this section. Antigen-specific coverage estimates are available in the data table below the graph. For more information on methods used in this and previous reports, please refer to the [Technical Annex](#).

7-Year-Olds

[Figure 9a](#), [Figure 9b](#) and [Figure 9c](#) present provincial coverage estimates by antigen for the 2013–14 through 2017–18 school years among 7-year-olds.

Figure 9a. Measles, mumps and rubella immunization coverage in Ontario among children 7 years old: 2013–14 to 2017–18 school years

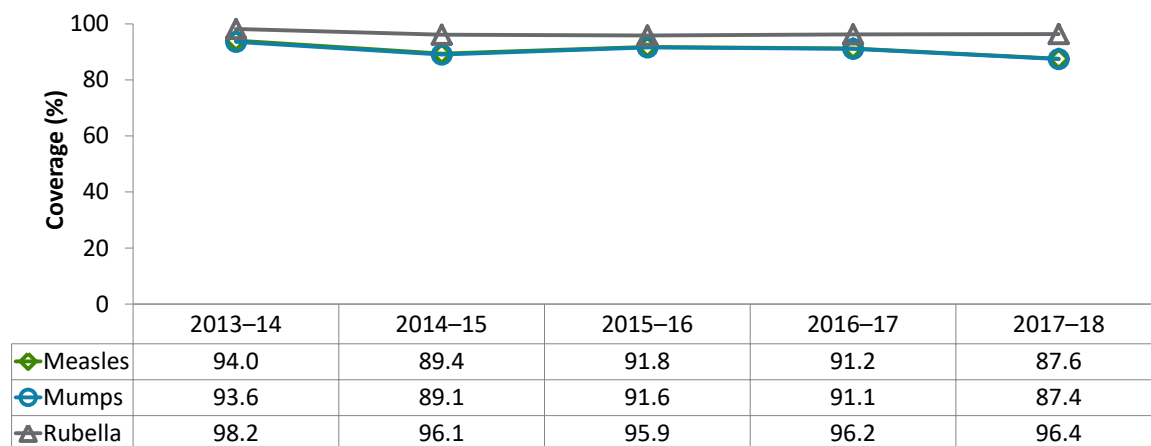


Figure 9b. Diphtheria, tetanus, polio and pertussis immunization coverage in Ontario among children 7 years old: 2013–14 to 2017–18 school years

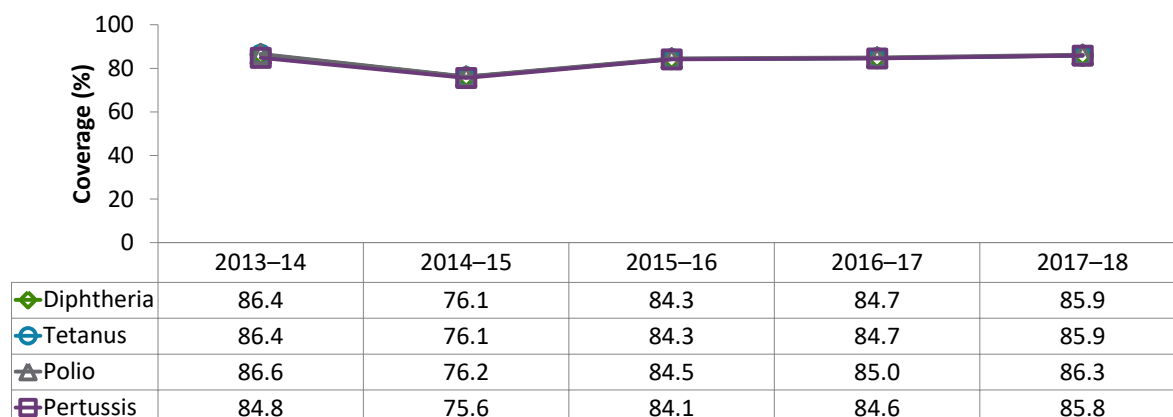
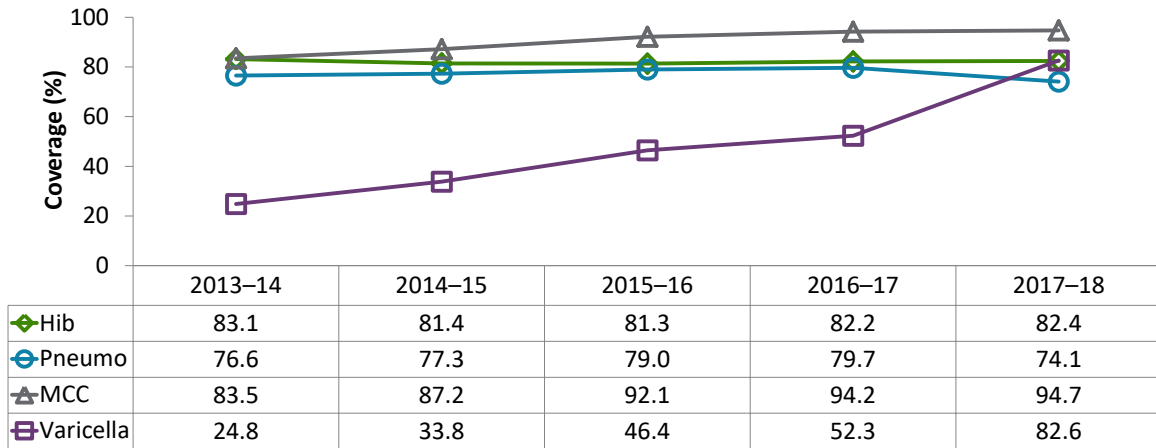


Figure 9c. *Haemophilus influenzae* type b (Hib), pneumococcal, meningococcal C conjugate (MCC) and varicella immunization coverage in Ontario among children 7 years old: 2013–14 to 2017–18 school years



17-Year-Olds

[Figure 10a](#) and [Figure 10b](#) present provincial coverage estimates by antigen for the 2013–14 through 2017–18 school years among 17-year-olds.

Figure 10a. Measles, mumps and rubella immunization coverage in Ontario among children 17 years old: 2013–14 to 2017–18 school years

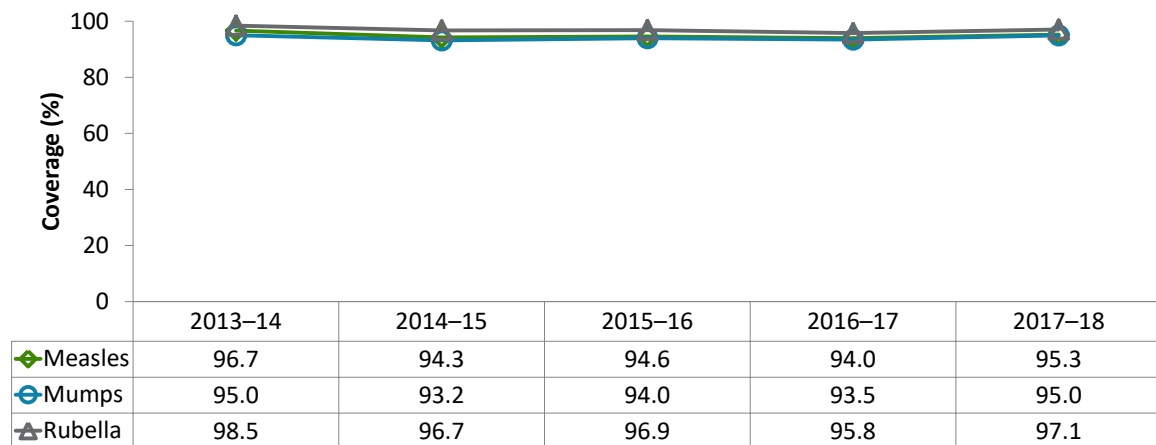
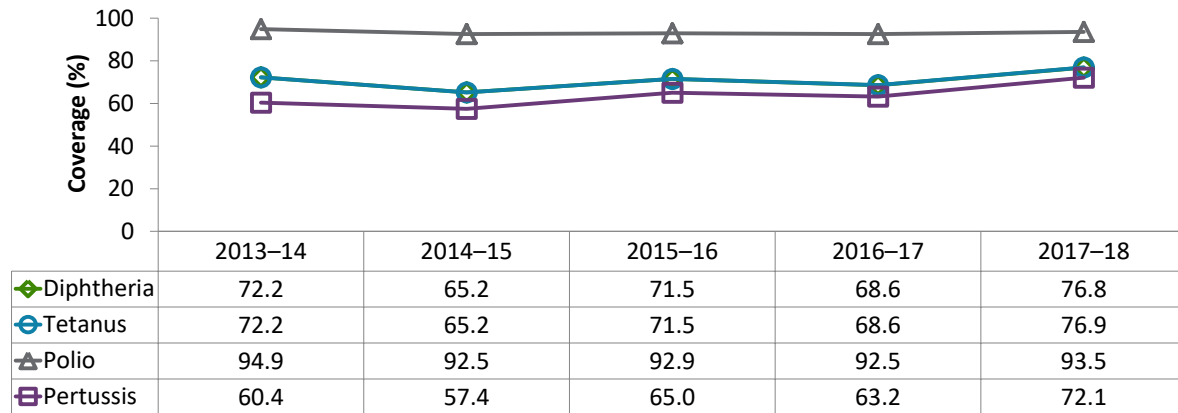


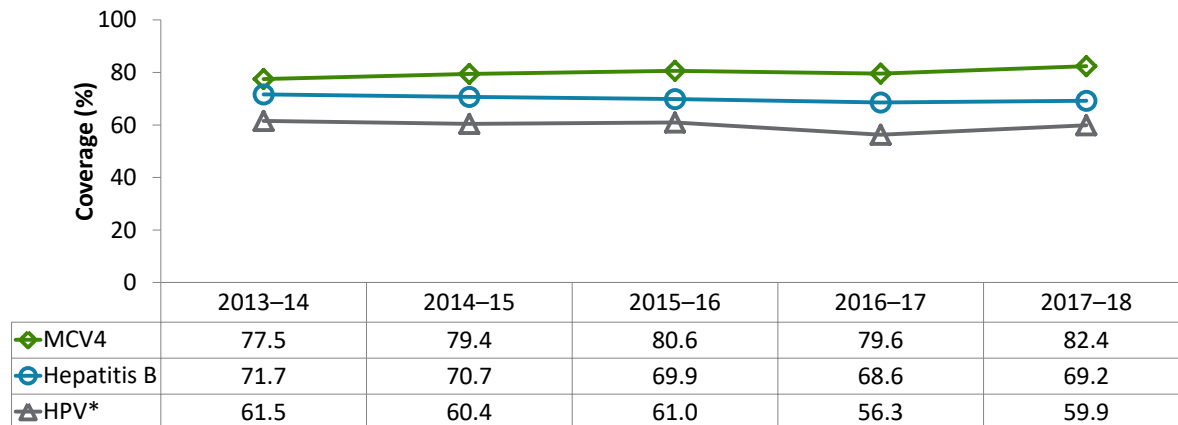
Figure 10b. Diphtheria, tetanus, polio and pertussis immunization coverage in Ontario among children 17 years old: 2013–14 to 2017–18 school years



School-Based Immunization Programs

Figure 11 shows trends for the 2013–14 through 2017–18 school years for Ontario’s three school-based immunization programs.

Figure 11. Immunization coverage in Ontario for school-based immunization programs among children 12 years old: 2013–14 to 2017–18 school years



*HPV coverage estimates for 2013–14 to 2015–16 school years represent 13-year-old female cohorts whereas the 2016–17 school year represents 12-year-old male and females combined and the 2017–18 school year represents all 12-year-old students (male, female and unknown gender combined). Students who completed either a valid 2-dose or 3-dose series were considered up-to-date for all assessment years. For further details, see the HPV up-to-date immunization coverage specifications in the [Technical Annex](#).

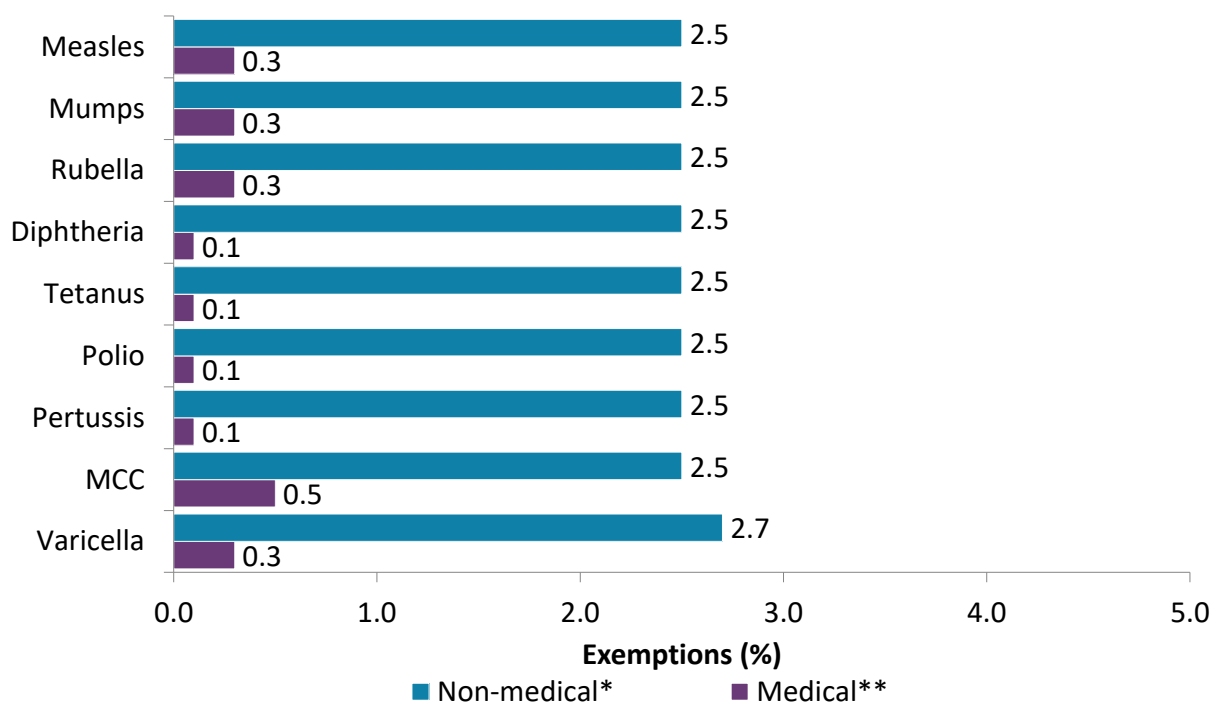
Immunization Exemptions for the 2017–18 School Year

Analyses of immunization exemptions are a new addition to the report for the 2017–18 school year. In addition to the 2017–18 school year results below, provincial estimates of non-medical and medical exemptions by *ISPA*-designated disease for school years 2013–14 through 2017–18 are available in [Appendix 4](#) of this report.

7-Year-Olds

[Figure 12](#) shows the percentage of 7-year-old students with non-medical and medical exemptions for diseases designated under the *ISPA* for the 2017–18 school year. We assessed only *ISPA*-designated antigens that are also assessed for immunization coverage at 7 years of age. Additional analyses of the percentage of 7-year-olds with non-medical and medical exemptions for at least one disease designated under the *ISPA* by PHU are available in [Table 1](#) and [Table 2](#) of [Appendix 5](#).

Figure 12. Immunization exemptions for *ISPA* designated diseases in Ontario among children 7 years old: 2017–18 school year



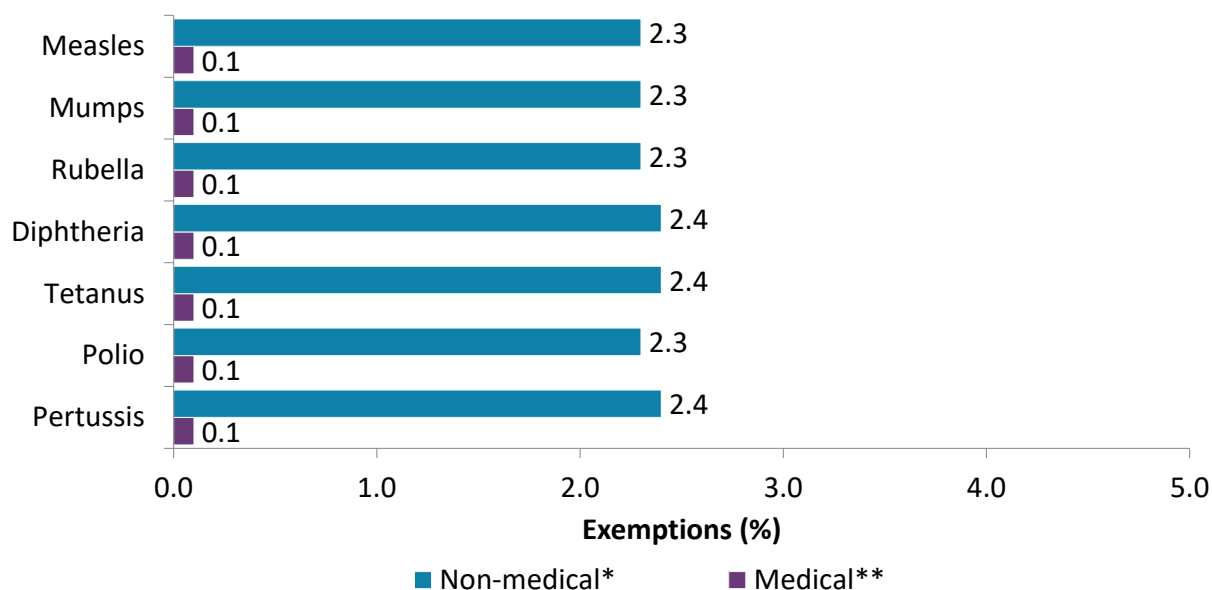
* Includes children with a non-medical exemption submitted due to conscientious objection or religious belief.

** Includes children with a medical exemption submitted due to a medical contraindication.

17-Year-Olds

Figure 13 shows the percentage of 17-year-old students with non-medical and medical exemptions for diseases designated under the *ISPA* for the 2017–18 school year. We assessed only *ISPA*-designated antigens that are also assessed for immunization coverage at 17 years of age. Table 1 and Table 2 of Appendix 5 present the percentage of 17-year-olds with non-medical and medical exemptions for at least one disease designated under the *ISPA* by PHU.

Figure 13. Immunization exemptions for ISPA designated diseases in Ontario among children 17 years old: 2017–18 school year



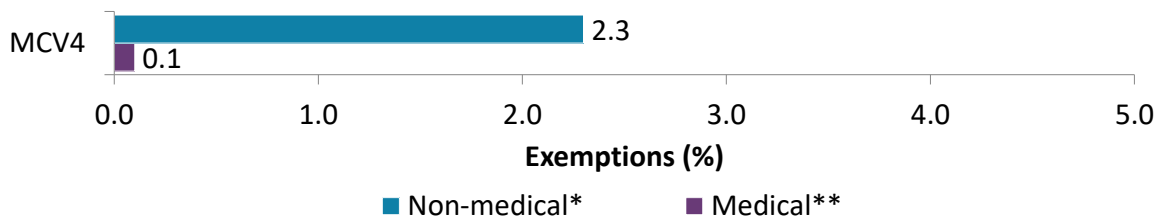
* Includes children with a non-medical exemption submitted due to conscientious objection or religious belief.

** Includes children with a medical exemption submitted due to a medical contraindication.

School-Based Immunization Programs

Figure 14 shows the percentage of 12-year-old students with non-medical and medical exemptions for MCV4 for the 2017–18 school year. We assessed only *ISPA*-designated antigens that are also assessed for immunization coverage at 12 years of age. MCV4 is the only school-based immunization program to which the *ISPA* applies (i.e., invasive meningococcal disease is a designated disease under the *ISPA*).

Figure 14. Immunization exemptions for MCV4 in Ontario among children 12 years old: 2017–18 school year



* Includes children with a non-medical exemption submitted due to conscientious objection or religious belief.

** Includes children with a medical exemption submitted due to a medical contraindication.

Discussion

Our immunization coverage assessment for the 2017–18 school year shows that immunization coverage among school pupils varies depending on antigen, age group and PHU. These coverage estimates build on the previous reports of up-to-date coverage in Ontario, with five years of data now available to monitor immunization coverage trends using this methodology.

Childhood Immunization Programs Started in Infancy and Early Childhood

There are many factors that impact immunization coverage estimates, especially when comparing antigens assessed at both 7 and 17 years of age. Although vaccine uptake at these two age milestones may be reflective of secular changes in vaccination acceptance, the timing of routine immunization schedules could also explain at least some of the differences seen. For example, we expect measles coverage to be higher among 17-year-olds compared to 7-year-olds, as seen in the 2017–18 school year (87.6% for 7-year-olds provincially, 95.3% for 17-year-olds provincially). Following the Ontario routine schedule, all measles-containing vaccinations are completed by 7 years of age; therefore, assessment of 17-year-olds provides 10 additional years to complete and document in the DHIR the same vaccination requirements as 7-year-olds. In contrast, the provincial coverage estimate for diphtheria is 9.1 percentage points lower among 17-year-olds compared to 7-year-olds (85.9% for 7-year-olds provincially, 76.8% for 17-year-olds provincially). This is also an expected pattern, as an additional dose of diphtheria is needed after 7 years of age (in the form of Tdap vaccine at 14–16 years of age) for students to be considered up-to-date at 17 years of age.

Two vaccination programs started in early childhood have seen significant improvements in coverage among 7-year-olds since we started using up-to-date methods in the 2013–14 school year. Coverage for MCC, a one-dose program at 12 months of age, has increased from 83.5% in the 2013–14 school year to 94.7% in the 2017–18 school year. Meningococcal disease was added to the list of *ISPA*-designated diseases in September 2014 which likely contributed to the increasing trend. There has also been an impressive increase in coverage for the two-dose varicella program among 7-year-olds, from 24.8% in the 2013–14 school year to 82.6% in the 2017–18 school year. This can be attributed, at least in part, to children born in 2010 being the first 7-year-old cohort to have been vaccinated using a routine two-dose varicella schedule that was initiated in August 2011, despite any child born since 2000 being eligible for two-doses.⁷ In addition, they are also the first 7-year-old cohort for which varicella is designated under the *ISPA*, since the designation for varicella only applies to children born in 2010 or later.

The programs with the lowest coverage measured at 7 years of age in the 2017–18 school year are Hib (82.4%) and pneumococcal conjugate (74.1%). Although these programs represent diseases with important morbidity and mortality for children, neither are designated under the *ISPA*. As such, the

coverage estimates may be underestimates if some PHUs do not actively collect records of immunization for these antigens.

Although vaccination programs have successfully reduced the incidence of VPDs covered in Ontario's publicly-funded early childhood immunization programs, outbreaks and sporadic cases of some of these VPDs still occur in Ontario, highlighting the importance of improving and maintaining high immunization coverage. The last case of endemic measles in Canada occurred in 1997;⁸ however, imported cases of measles continue to occur, with Ontario having an average of 14 reported measles cases annually over 2013-2017.⁹ High immunization coverage is needed to minimize the risk of transmission of this highly communicable disease.¹⁰ We have also seen an increase in cases of mumps in Ontario, with over 250 cases reported in 2017 alone, compared to an average of 26 cases per year reported in the 5 years prior.¹¹ Many of these cases occurred in adults who only received one dose of mumps-containing vaccine.¹² Although waning of mumps immunity following vaccination plays a role in the transmission of mumps,¹³ this disease burden highlights the importance of maintaining high two-dose mumps immunization coverage. Pertussis is another VPD of concern in Ontario as it continues to be endemic, with a range of 124 to 1,265 cases reported annually between 2005 and 2017.¹⁴ The disease is most dangerous for those infants under 1 year of age who have completed their primary series of pertussis-containing vaccine. High overall immunization coverage is important to build up population immunity and reduce the chances of infants becoming infected with the disease.¹⁵ In addition, a targeted immunization strategy of administering a dose of pertussis-containing vaccine (i.e., Tdap) to pregnant women has been recently recommended by Canada's National Advisory Committee on Immunization (NACI) to provide protection to young infants.¹⁶

Vaccines Administered in School-Based Programs

Among the school-based programs, 2017–18 school year provincial coverage at 12 years of age is highest for MCV4 (82.4%), with coverage 22.5 percentage points higher than HPV (59.9%). MCV4 coverage is likely the highest of these programs as the vaccine series requires only one dose. The high degree of public concern around meningococcal disease also likely leads to high acceptability for this vaccine and it is the only school-based immunization program that is also designated under the *ISPA*.

Grade 7 students are eligible for one dose of MCV4 vaccine through Ontario's school-based program and remain eligible until the vaccine is received (i.e., eligibility in perpetuity). The other two school-based immunization programs offer two doses of hepatitis B vaccine and two doses of HPV vaccine to Grade 7 students. A student who misses one or both doses of either vaccine in Grade 7 are eligible to receive publicly-funded vaccines as part of extended eligibility programs until the end of their Grade 8 year for hepatitis B and until the end of their Grade 12 year for HPV.² Although coverage estimates for all three school-based programs in Ontario are currently below the national coverage goals, our analysis of Grade 7 students does not incorporate doses delivered after Grade 7. In the 2017–18 school year, 83.3% and 72.3% of students initiated the hepatitis B and HPV vaccine series compared to the coverage (series completion) estimates of 69.2% and 59.9% respectively. It is anticipated that coverage may be higher for vaccines given in school-based programs if doses given after Grade 7 were to be included in future assessments.

School-based vaccine delivery serves as an important platform to achieve high immunization coverage among adolescents who tend to have a low frequency of health care provider visits for preventive care.^{31,32} Delivering these vaccines through school-based clinics removes some of the barriers to access and contributes to improving equity in immunization uptake.^{17,18} It should be noted that the school-based immunization programs, particularly hepatitis B and HPV, have some of the lowest coverage estimates at the provincial-level, leaving Ontarians at risk for these diseases that are associated with significant morbidity and mortality. Vaccination against HPV has been shown to substantially reduce the risk of anal and genital warts, cervical cancer and other genitourinary cancers in both males and females;¹⁹ the hepatitis B vaccine series is 95% to 100% effective in preventing infection with the hepatitis B virus which can lead to chronic complications including serious liver disease;²⁰ and although rare, invasive meningococcal disease has a high case fatality rate (10% of cases) and the potential for long-term sequelae.²¹ While the safety and efficacy of the vaccines delivered through school-based programs have been established, further work is needed to better understand how to improve coverage for these programs.

Geographic Variability

There is considerable variability in coverage estimates across PHUs, as indicated in [Appendix 1](#) of this report, highlighting that some areas within the province may be at greater risk for certain VPDs than others. In the 2017–18 school year, the greatest range between the highest and lowest PHU coverage estimates was 34 percentage points, which occurred for varicella among 7-year-olds. This is a substantial improvement from the 2016–17 school year assessment, where there was a range of 70 percentage points for diphtheria, tetanus and pertussis among 17-year-olds. This narrowing of the difference between PHUs in the 2017–18 school year is the direct result of PHUs with very low coverage estimates in the 2016–17 school year showing substantial improvements in their reported estimates in the 2017–18 school year. Improvements in reported coverage could be indicative of higher immunization uptake in these areas or may be due to better data collection, as variability in *ISPA* assessment and enforcement activities within the PHU are known to influence the completeness of immunization information within the DHIR. Other reasons for the variability in coverage estimates among PHUs may be explained by factors such as immunization delivery practices and community level influences on immunization acceptance.

Coverage Goals

In this report, Ontario's provincial coverage estimates are compared to Canada's national coverage goals, which were updated in 2017 as part of the National Immunization Strategy objectives for 2016–2021.²² The national vaccination coverage goals were developed following a review of international standards and best practices. Of note, the national goals were set to be achieved by 2025 and are being compared to provincial coverage estimates for the 2017–18 school year. As well, the specifications (e.g., dose requirements) of some of the national goals align with the provincial up-to-date coverage specifications better than others, and differences in specifications are an additional consideration when making comparisons between provincial estimates and national goals. The provincial coverage estimates

for the 2017–18 school year, with the exceptions of rubella at 7 years of age and measles, mumps and rubella at 17 years of age, do not meet Canada’s newly revised national coverage goals; however, it should be noted that many PHUs have local coverage estimates which surpassed the national goals for various antigens and ages assessed.

Immunization Exemptions

Although the overall proportion of students with non-medical exemptions at the provincial level is relatively low and medical exemptions are very rare, further work is needed to understand the characteristics of students with exemptions. Previous work in Ontario has found that students with *ISPA* exemptions are not necessarily unimmunized and that parents seek out non-medical exemptions for a diverse set of reasons.²³ By adding analyses of exemptions to the coverage report this 2017–18 school year (including the analyses of exemptions from the 2013–14 to 2016–17 school year), we now have five years of data from which we can monitor changes in exemptions in the province over time.

Notes on Interpretation

The coverage estimates summarized within this report should be considered in the context of Ontario’s immunization system, which is complex and involves multiple providers and organizations within both the primary care and public health sectors. With the exception of the three school-based adolescent programs primarily delivered by local PHUs, the vast majority of infant and childhood immunizations are delivered by community-based health care providers; however, the responsibility for immunization surveillance activities for all antigens analyzed in this report rests with local PHUs.

In Ontario, local PHUs obtain immunization information from parents and guardians, who are responsible for reporting their child’s immunization records to the PHU. Parents and guardians may only become aware of their responsibility to report this information when their child starts attending school or after being notified by their local PHU that their child has vaccine doses outstanding based on information available to the PHU. Thus, both PHU assessment activities and reporting by parents and guardians are important contributors to the completeness of immunization information included in this report. As such, it is possible that some coverage estimates may be underestimates if not all vaccine doses that have been administered have been captured within the DHIR.

There are several other important influences on immunization coverage surveillance that deserve mention. In Ontario, immunization coverage surveillance activities are focused on school-age children, as the *ISPA* provides the legislative authority for the collection of immunization information regarding children and adolescents who attend primary and secondary schools in Ontario. Since the population lists uploaded into the DHIR to identify local school children are based on school board and other school attendance lists, children who attend non-traditional schools (e.g., are home-schooled or have dropped out of school) may not be fully represented in the data for this report. Although the *CCYEA* includes immunization reporting requirements,^{5,6} we are unable to report on immunization coverage prior to school entry, for example at two years of age (an important national and international age milestone for coverage assessment), because not all Ontario children attend child care facilities.

For further details about the limitations of the data presented within this report, please see the [Technical Annex](#).

Conclusions

Immunization coverage assessment in Ontario is driven by provincial legislation and the dedication and collective efforts of immunization providers, schools, parents and guardians, and public health professionals across the province. This work has enabled Public Health Ontario to calculate up-to-date coverage estimates for five consecutive school years at the provincial and PHU-level. These coverage estimates support examination of recent temporal trends in immunization coverage and contribute to ongoing work by public health units and other stakeholders to better understand immunization acceptance and uptake.²⁴ As high immunization coverage is essential for preventing morbidity and mortality from VPDs, robust immunization information systems ensure immunization coverage estimates are monitored in a timely and accurate manner.

In this 2017–18 school year immunization coverage report, we have seen successes including increasing MCC and varicella coverage throughout the province. Although there are programs that fall short of national coverage goals, many PHU-level coverage estimates surpass the coverage goals for various antigens and ages of assessment. In addition, there have been notable reductions in the range of PHU coverage estimates between the highest and lowest PHUs for the 2017–18 school year.

Our routine and standardized assessment of immunization coverage in Ontario provides essential data to support immunization program planning at the PHU and provincial-level.

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Appendix 1: Immunization Coverage by Public Health Unit

Table 1. Immunization coverage (%) among children 7 years old by Public Health Unit in Ontario: 2017–18 school year*

Public Health Unit	Mea	Mumps	Rubella	Dip	Tet	Polio	Pert	Hib	Pneum	MCC	Var
Algoma Public Health	88.0	88.0	98.2	87.3	87.3	87.3	87.3	92.0	75.7	98.1	84.0
Brant County Health Unit	94.4	94.3	96.9	93.7	93.7	94.2	93.7	84.6	72.3	96.1	90.7
Chatham-Kent Public Health	93.6	93.6	96.5	93.9	93.9	94.7	93.8	89.7	77.1	95.4	94.0
City of Hamilton Public Health Services	93.8	93.7	97.1	91.6	91.5	92.5	91.4	79.4	71.1	96.5	90.1
Durham Region Health Department	95.5	95.5	97.7	94.8	94.8	95.2	94.8	87.7	77.2	97.1	93.5
Eastern Ontario Health Unit	93.4	93.4	96.4	93.5	93.5	93.5	93.5	88.6	77.9	96.0	91.6
Elgin St. Thomas Public Health	89.7	89.7	92.7	89.5	89.5	89.7	89.5	85.2	76.2	91.1	86.0
Grey Bruce Health Unit	94.5	94.5	96.6	94.8	94.8	94.9	94.7	90.8	79.3	95.5	92.6
Haldimand-Norfolk Health Unit	87.9	87.8	94.4	87.5	87.5	88.2	87.5	77.7	67.2	91.5	82.3
Haliburton, Kawartha, Pine Ridge District Health Unit	94.2	94.1	97.4	94.0	94.0	94.7	94.0	85.0	75.3	96.8	90.6
Halton Region Public Health	72.6	72.4	93.7	68.9	68.9	68.6	68.5	81.2	72.7	87.4	61.7
Hastings Prince Edward Public Health	94.4	94.4	97.7	93.5	93.5	94.2	93.5	85.6	75.8	96.7	89.4

Public Health Unit	Mea	Mumps	Rubella	Dip	Tet	Polio	Pert	Hib	Pneum	MCC	Var
Huron County Health Unit	92.9	92.9	94.9	93.0	93.0	93.4	93.0	89.2	83.0	94.1	89.7
Kingston, Frontenac and Lennox & Addington Public Health	96.6	96.5	98.1	95.8	95.8	96.5	95.7	90.1	82.0	97.6	94.5
Lambton Public Health	94.7	94.7	96.9	94.6	94.6	94.7	94.6	84.7	69.2	95.8	93.2
Leeds, Grenville & Lanark District Health Unit	93.0	93.0	96.9	92.7	92.7	93.4	92.6	87.0	75.4	94.9	91.5
Middlesex-London Health Unit	91.0	90.9	95.4	88.7	88.7	89.5	88.6	81.9	74.3	94.3	88.1
Niagara Region Public Health	91.2	91.1	97.3	90.5	90.5	90.9	90.4	86.5	81.4	95.7	87.9
North Bay Parry Sound District Health Unit	96.5	96.5	98.5	96.5	96.5	96.3	96.5	93.5	82.4	98.2	95.1
Northwestern Health Unit	86.7	86.7	94.0	86.4	86.4	86.9	86.4	81.4	82.0	93.0	84.9
Ottawa Public Health	89.3	89.2	98.5	87.6	87.6	88.2	87.5	84.8	76.2	97.4	85.6
Oxford County Public Health & Emergency Services	89.3	89.3	91.6	89.0	89.0	89.0	89.0	83.3	72.5	90.0	87.3
Peel Public Health	85.1	84.9	98.5	83.4	83.3	83.6	83.2	80.5	72.7	97.4	77.3
Perth District Health Unit	93.3	93.3	95.5	92.3	92.3	92.8	92.3	88.7	82.2	95.0	91.0
Peterborough Public Health	93.6	93.5	97.0	93.0	93.0	93.2	93.0	89.0	73.8	96.2	91.0
Porcupine Health Unit	95.7	95.7	97.9	95.7	95.7	96.1	95.7	87.1	85.7	97.7	93.6
Public Health Sudbury & Districts	96.4	96.4	98.0	95.8	95.8	95.8	95.8	85.7	72.8	97.8	95.4

Public Health Unit	Mea	Mumps	Rubella	Dip	Tet	Polio	Pert	Hib	Pneum	MCC	Var
Region of Waterloo Public Health and Emergency Services	93.5	93.5	97.4	92.1	92.1	92.9	92.1	84.5	72.8	96.7	91.4
Renfrew County and District Health Unit	96.8	96.8	98.4	96.4	96.4	96.6	96.4	89.5	80.3	97.8	94.8
Simcoe Muskoka District Health Unit	93.2	93.1	96.9	92.7	92.7	93.4	92.7	85.1	75.9	95.5	90.3
Thunder Bay District Health Unit	94.9	94.9	97.9	93.1	93.1	94.0	93.1	85.1	72.9	97.2	92.0
Timiskaming Health Unit	94.9	94.9	97.6	94.6	94.6	95.2	94.6	93.7	91.2	97.3	93.1
Toronto Public Health	74.3	73.9	93.5	70.9	70.9	71.4	70.7	75.9	69.2	90.3	65.0
Wellington-Dufferin-Guelph Public Health	94.5	94.5	97.2	93.6	93.6	94.2	93.6	84.6	76.9	95.9	91.5
Windsor-Essex County Health Unit	90.9	90.9	96.8	88.4	88.4	89.3	88.3	80.0	75.2	96.3	87.1
York Region Public Health	92.1	92.0	95.9	91.6	91.6	91.9	91.5	81.2	74.5	94.8	88.8
ONTARIO	87.6	87.4	96.4	85.9	85.9	86.3	85.8	82.4	74.1	94.7	82.6

Notes: Meas=Measles, Dip=Diphtheria, Tet=Tetanus, Pertuss=Pertussis, Hib=*Haemophilus influenzae* type b, Pneum=Pneumococcal, MCC=Meningococcal C conjugate, Var=Varicella

* Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on the PHO Immunization Coverage webpage.

Table 2. Immunization coverage (%) among children 17 years old by Public Health Unit in Ontario: 2017–18 school year**

Public Health Unit	Measles	Mumps	Rubella	Diphtheria	Tetanus	Polio	Pertussis
Algoma Public Health	98.5	98.4	98.9	85.3	85.3	97.5	82.0
Brant County Health Unit	96.4	96.3	97.5	80.9	80.9	95.8	77.7
Chatham-Kent Public Health	98.0	97.8	99.3	83.7	83.7	96.9	78.7
City of Hamilton Public Health Services	92.0	91.7	94.3	71.2	71.2	89.6	67.3
Durham Region Health Department	97.8	97.7	98.7	80.2	80.3	96.7	76.8
Eastern Ontario Health Unit	96.5	96.0	97.7	81.9	81.9	94.8	80.4
Elgin St. Thomas Public Health	95.7	95.6	96.8	82.2	82.3	95.4	81.3
Grey Bruce Health Unit	94.0	94.0	94.8	85.5	85.5	93.7	83.2
Haldimand-Norfolk Health Unit	91.7	91.8	95.2	69.4	69.4	89.0	68.6
Haliburton, Kawartha, Pine Ridge District Health Unit	96.7	96.7	97.7	78.6	78.6	96.0	75.5
Halton Region Public Health	96.0	95.6	97.4	79.2	79.2	94.9	75.3
Hastings Prince Edward Public Health	97.7	97.4	98.5	85.2	85.3	96.9	82.6
Huron County Health Unit	92.3	92.3	93.1	83.9	83.9	91.6	83.1
Kingston, Frontenac and Lennox & Addington Public Health	98.0	97.9	99.2	87.1	87.2	97.1	85.7

Public Health Unit	Measles	Mumps	Rubella	Diphtheria	Tetanus	Polio	Pertussis
Lambton Public Health	98.0	98.0	98.9	82.9	82.8	97.1	80.0
Leeds, Grenville & Lanark District Health Unit	90.6	90.5	92.0	70.5	70.5	88.9	68.6
Middlesex-London Health Unit	94.4	94.2	96.2	69.8	69.8	93.0	67.4
Niagara Region Public Health	96.5	96.1	98.4	81.6	81.6	96.1	77.1
North Bay Parry Sound District Health Unit	97.8	97.7	98.6	81.2	81.2	97.4	77.8
Northwestern Health Unit	89.2	89.2	95.3	72.5	72.4	88.4	71.9
Ottawa Public Health	97.3	97.0	98.6	77.2	77.2	94.9	71.0
Oxford County Public Health & Emergency Services	94.5	96.3	95.1	78.6	78.6	93.8	74.1
Peel Public Health	97.1	96.9	98.9	79.4	79.4	95.5	70.9
Perth District Health Unit	94.1	93.7	95.4	86.1	86.1	93.2	85.1
Peterborough Public Health	96.6	96.6	97.9	82.5	82.5	95.7	79.2
Porcupine Health Unit	98.4	98.4	99.2	89.0	89.0	97.5	86.5
Public Health Sudbury & Districts	98.3	98.2	98.6	82.6	82.6	97.1	80.3
Region of Waterloo Public Health and Emergency Services	96.1	96.0	97.5	82.5	82.6	94.6	80.8
Renfrew County and District Health Unit	97.3	97.3	98.2	87.9	87.9	96.9	87.1

Public Health Unit	Measles	Mumps	Rubella	Diphtheria	Tetanus	Polio	Pertussis
Simcoe Muskoka District Health Unit	92.9	92.5	97.3	57.7	57.8	91.5	55.6
Thunder Bay District Health Unit	97.5	97.5	98.4	90.9	90.9	97.1	89.4
Timiskaming Health Unit	99.4	99.4	99.7	90.1	90.1	99.4	86.9
Toronto Public Health	93.8	93.3	96.4	74.3	74.3	90.7	65.6
Wellington-Dufferin-Guelph Public Health	96.6	96.3	97.8	82.2	82.2	95.0	79.3
Windsor-Essex County Health Unit	97.2	96.9	98.6	81.3	81.3	94.2	79.6
York Region Public Health	92.0	91.2	93.7	70.6	70.6	90.9	67.4
ONTARIO	95.3	95.0	97.1	76.8	76.9	93.5	72.1

** Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on on the PHO Immunization Coverage webpage.

Table 3. Immunization coverage (%) for school-based immunization programs among children 12 years old by Public Health Unit in Ontario: 2017–18 school year***

Public Health Unit	MCV4	Hepatitis B	HPV
Algoma Public Health	81.5	64.9	55.8
Brant County Health Unit	78.9	71.0	60.9
Chatham-Kent Public Health	86.3	77.9	60.1
City of Hamilton Public Health Services	84.3	74.9	63.8
Durham Region Health Department	90.6	76.2	68.6
Eastern Ontario Health Unit	83.8	68.8	60.2
Elgin St. Thomas Public Health	77.1	58.6	45.6
Grey Bruce Health Unit	92.2	74.8	64.2
Haldimand-Norfolk Health Unit	61.8	61.1	51.2
Haliburton, Kawartha, Pine Ridge District Health Unit	78.7	61.9	53.5
Halton Region Public Health	80.2	65.1	55.7
Hastings Prince Edward Public Health	90.8	73.8	60.7
Huron County Health Unit	79.6	65.7	53.8
Kingston, Frontenac and Lennox & Addington Public Health	93.3	80.5	70.8
Lambton Public Health	73.8	51.4	42.6
Leeds, Grenville & Lanark District Health Unit	79.8	59.7	48.9
Middlesex-London Health Unit	77.7	63.1	52.1
Niagara Region Public Health	85.3	69.5	59.7
North Bay Parry Sound District Health Unit	77.7	66.1	56.8
Northwestern Health Unit	72.3	56.5	47.1

Public Health Unit	MCV4	Hepatitis B	HPV
Ottawa Public Health	86.4	73.2	62.7
Oxford County Public Health & Emergency Services	77.9	62.6	51.1
Peel Public Health	79.6	63.2	55.3
Perth District Health Unit	90.7	82.3	67.0
Peterborough Public Health	79.1	63.4	56.3
Porcupine Health Unit	89.7	77.3	66.6
Public Health Sudbury & Districts	82.8	67.6	57.2
Region of Waterloo Public Health and Emergency Services	82.0	70.8	61.2
Renfrew County and District Health Unit	81.0	67.2	60.6
Simcoe Muskoka District Health Unit	89.6	73.6	67.7
Thunder Bay District Health Unit	79.7	57.8	51.2
Timiskaming Health Unit	85.5	62.1	49.7
Toronto Public Health	82.4	71.9	64.2
Wellington-Dufferin-Guelph Public Health	85.8	70.1	58.4
Windsor-Essex County Health Unit	82.9	71.9	60.9
York Region Public Health	76.8	67.9	56.7
ONTARIO	82.4	69.2	59.9

Notes: MCV4=Quadrivalent meningococcal conjugate, HPV=Human papillomavirus

*** Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on the PHO Immunization Coverage webpage.

Appendix 2: Immunization Coverage by Local Health Integration Network

Table 1. Immunization coverage (%) among children 7 years old by Local Health Integration Network in Ontario: 2017–18 school year*

Local Health Integrated Network	Me a	Mump s	Rubell a	Dip	Tet	Poli o	Pert	Hib	Pneu m	MC C	Var
Central	86.3	86.1	95.1	84. 9	84. 9	85.3	84. 8	78. 8	72.5	93.1	81. 0
Central East	88.4	88.2	96.8	86. 4	86. 4	86.9	86. 3	83. 3	73.5	95.3	83. 4
Central West	84.8	84.6	97.9	82. 8	82. 8	82.9	82. 6	80. 3	72.8	97.0	76. 7
Champlain	90.6	90.5	98.1	89. 4	89. 4	89.8	89. 3	85. 8	76.7	97.2	87. 5
Erie St. Clair	92.1	92.1	96.8	90. 4	90. 4	91.2	90. 4	82. 5	74.4	96.1	89. 4
Hamilton Niagara Haldimand Brant	89.7	89.6	96.4	87. 9	87. 9	88.4	87. 8	82. 3	73.9	94.7	85. 0
Mississauga Halton	79.4	79.2	96.2	77. 1	77. 1	77.2	76. 9	80. 1	72.4	92.7	70. 7
North Simcoe Muskoka	93.1	93.1	96.8	92. 7	92. 7	93.4	92. 7	85. 2	75.8	95.4	90. 2
North-East	94.5	94.5	98.1	94. 1	94. 1	94.2	94. 1	89. 4	78.5	97.9	92. 6

Local Health Integrated Network	Meas	Mumps	Rubella	Dip	Tet	Polio	Pert	Hib	Pneum	MCC	Var
North-West	91.7	91.7	96.4	90.5	90.5	91.3	90.5	83.8	76.5	95.6	89.3
South East	94.8	94.8	97.7	94.3	94.3	95.0	94.2	87.7	78.2	96.8	91.7
South West	91.4	91.4	94.9	90.2	90.2	90.7	90.2	84.6	76.1	93.7	88.6
Toronto Central	73.8	73.5	92.9	70.9	70.9	71.2	70.8	78.0	71.0	89.7	65.2
Waterloo Wellington	93.9	93.8	97.4	92.4	92.4	93.2	92.4	84.5	73.9	96.6	91.4
ONTARIO	87.6	87.4	96.4	85.9	85.9	86.3	85.8	82.4	74.1	94.7	82.6

Notes: Meas=Measles, Dip=Diphtheria, Tet=Tetanus, Pertuss=Pertussis, Hib=*Haemophilus influenzae* type b, Pneum=Pneumococcal, MCC=Meningococcal C conjugate, Var=Varicella

* Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on the PHO Immunization Coverage webpage.

Table 2. Immunization coverage (%) among children 17 years old by Local Health Integration Network in Ontario: 2017–18 school year**

Local Health Integrated Network	Measles	Mumps	Rubella	Diphtheria	Tetanus	Polio	Pertussis
Central	92.3	91.6	94.8	70.1	70.1	90.4	64.8
Central East	96.7	96.4	98.0	79.8	79.8	95.1	73.9
Central West	97.4	97.3	98.8	79.8	79.8	95.6	71.9
Champlain	96.9	96.6	98.2	78.3	78.3	94.8	73.4
Erie St. Clair	97.4	97.2	98.7	81.8	81.8	95.1	79.4
Hamilton Niagara Haldimand Brant	94.3	94.0	96.3	76.6	76.6	92.8	72.9
Mississauga Halton	96.1	95.7	98.1	78.4	78.4	94.6	70.9
North Simcoe Muskoka	93.1	92.7	97.3	58.7	58.7	91.7	56.7
North-East	98.3	98.2	98.8	83.9	83.9	97.4	81.1
North-West	93.9	93.8	97.0	83.0	83.0	93.3	82.0
South East	96.2	96.0	97.2	82.7	82.7	95.1	80.7
South West	94.3	94.3	95.7	76.5	76.5	93.4	74.3
Toronto Central	93.6	93.3	96.0	73.2	73.2	90.5	66.2
Waterloo Wellington	96.2	96.1	97.6	82.4	82.5	94.7	80.3
ONTARIO	95.3	95.0	97.1	76.8	76.9	93.5	72.1

** Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on on the PHO Immunization Coverage webpage.

Table 3. Immunization coverage (%) for school-based immunization programs among children 12 years old by Local Health Integration Network in Ontario: 2017–18 school year ***

Local Health Integrated Network	MCV4	Hepatitis B	HPV
Central	78.4	69.3	58.8
Central East	87.2	74.1	66.5
Central West	79.7	61.4	56.5
Champlain	85.4	71.7	61.8
Erie St. Clair	81.9	69.3	57.6
Hamilton Niagara Haldimand Brant	82.4	70.6	60.6
Mississauga Halton	79.2	66.5	54.8
North Simcoe Muskoka	90.3	73.5	67.7
North-East	82.6	67.9	57.8
North-West	76.6	57.2	49.4
South East	88.9	72.8	61.5
South West	80.4	65.7	54.1
Toronto Central	82.1	70.9	65.2
Waterloo Wellington	83.7	71.3	61.1
ONTARIO	82.4	69.2	59.9

*** Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on the PHO Immunization Coverage webpage.

Appendix 3: Public Health Unit Abbreviations

Table 1. Public Health Unit abbreviations*

Code	Public Health Unit	Code	Public Health Unit
ALG	Algoma Public Health	NPS	North Bay Parry Sound District Health Unit
BRN	Brant County Health Unit	NWR	Northwestern Health Unit
CHK	Chatham-Kent Public Health	OTT	Ottawa Public Health
DUR	Durham Region Health Department	OXF[†]	Oxford County Public Health & Emergency Services
ELG[†]	Elgin St. Thomas Public Health	PDH	Perth District Health Unit
EOH	Eastern Ontario Health Unit	PEL	Peel Public Health
GBO	Grey Bruce Health Unit	PQP	Porcupine Health Unit
HAL	Halton Region Public Health	PTC	Peterborough Public Health
HAM	City of Hamilton Public Health Services	REN	Renfrew County and District Health Unit
HDN	Haldimand-Norfolk Health Unit	SMD	Simcoe Muskoka District Health Unit
HKP	Haliburton, Kawartha, Pine Ridge District Health Unit	SUD	Public Health Sudbury & Districts
HPE	Hastings Prince Edward Public Health	THB	Thunder Bay District Health Unit
HUR	Huron County Health Unit	TOR	Toronto Public Health
KFL	Kingston, Frontenac and Lennox & Addington Public Health	TSK	Timiskaming Health Unit
LAM	Lambton Public Health	WAT	Region of Waterloo Public Health and Emergency Services
LGL	Leeds, Grenville & Lanark District Health Unit	WDG	Wellington-Dufferin-Guelph Public Health
MSL	Middlesex-London Health Unit	WEC	Windsor-Essex County Health Unit
NIA	Niagara Region Public Health	YRK	York Region Public Health

* Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on on the PHO Immunization Coverage webpage.

[†] Effective May 1, 2018, Oxford County Public Health and Elgin-St. Thomas Health Unit merged to become Southwestern Public Health. For this assessment, the former health units were reported on separately, reflecting the configuration in place for the majority of the 2017–18 school year.

Appendix 4: Immunization Exemptions by Antigen

Table 1. Non-medical immunization exemptions (%) for diseases designated under the *ISPA* in Ontario: 2013–14 to 2017–18 school years*

Antigen	Age	2013–14	2014–15	2015–16	2016–17	2017–18
Diphtheria	7-year-olds	1.9	2.0	2.3	2.5	2.5
MCC	7-year-olds	N/A [†]	1.9	2.4	2.5	2.5
Measles	7-year-olds	2.0	2.0	2.4	2.5	2.5
Mumps	7-year-olds	2.0	2.0	2.4	2.5	2.5
Pertussis	7-year-olds	N/A [†]	2.0	2.3	2.5	2.5
Polio	7-year-olds	1.9	2.0	2.3	2.5	2.5
Rubella	7-year-olds	2.0	2.0	2.4	2.5	2.5
Tetanus	7-year-olds	1.9	2.0	2.3	2.5	2.5
Varicella	7-year-olds	N/A [§]	N/A [§]	N/A [§]	N/A [§]	2.7
MCV4	12-year-olds	N/A [†]	1.8	2.0	2.2	2.3
Diphtheria	17-year-olds	1.7	1.7	1.9	2.2	2.4
Measles	17-year-olds	1.7	1.7	1.9	2.1	2.3
Mumps	17-year-olds	1.7	1.7	1.9	2.1	2.3
Pertussis	17-year-olds	N/A [†]	1.7	2.0	2.2	2.4
Polio	17-year-olds	1.7	1.7	1.9	2.1	2.3
Rubella	17-year-olds	1.7	1.7	1.9	2.1	2.3
Tetanus	17-year-olds	1.7	1.7	1.9	2.2	2.4

* Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on on the PHO Immunization Coverage webpage.

[†]Disease was designated under the *ISPA* effective as of the fall of 2014.

[§]Disease was designated under the *ISPA* effective as of the fall of 2014, applicable to children born in 2010 or later.

Table 2. Medical immunization exemptions (%) for diseases designated under the *ISPA* in Ontario: 2013–14 to 2017–18 school years**

Antigen	Age	2013–14	2014–15	2015–16	2016–17	2017–18
Diphtheria	7-year-olds	0.1	0.1	0.1	0.1	0.1
MCC	7-year-olds	N/A ^{§§}	0.2	0.4	0.4	0.5
Measles	7-year-olds	0.2	0.1	0.3	0.2	0.3
Mumps	7-year-olds	0.2	0.1	0.3	0.2	0.3
Pertussis	7-year-olds	N/A ^{§§}	0.1	0.1	0.1	0.1
Polio	7-year-olds	0.1	0.1	0.1	0.1	0.1
Rubella	7-year-olds	0.2	0.1	0.3	0.2	0.3
Tetanus	7-year-olds	0.1	0.1	0.1	0.1	0.1
Varicella	7-year-olds	N/A [‡]	N/A [‡]	N/A [‡]	N/A [‡]	0.3
MCV4	12-year-olds	N/A ^{§§}	0.2	0.2	0.1	0.1
Diphtheria	17-year-olds	0.5	0.2	0.2	0.1	0.1
Measles	17-year-olds	0.4	0.2	0.2	0.2	0.1
Mumps	17-year-olds	0.4	0.2	0.2	0.2	0.1
Pertussis	17-year-olds	N/A ^{§§}	0.3	0.3	0.2	0.1
Polio	17-year-olds	0.4	0.2	0.2	0.1	0.1
Rubella	17-year-olds	0.4	0.2	0.2	0.2	0.1
Tetanus	17-year-olds	0.5	0.2	0.2	0.1	0.1

** Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on the PHO Immunization Coverage webpage.

^{§§}Disease was designated under the *ISPA* effective as of the fall of 2014.

[‡]Disease was designated under the *ISPA* effective as of the fall of 2014, applicable to children born in 2010 or later.

Appendix 5: Immunization Exemptions by Public Health Unit

Table 1. Non-medical exemptions (%) for at least one disease designated under the *ISPA* in Ontario by age: 2017–18 school year*

Public Health Unit	7-year-olds [†]	17-year-olds [§]
Algoma Public Health	3.2	2.5
Brant County Health Unit	4.9	4.5
Chatham-Kent Public Health	5.5	3.1
City of Hamilton Public Health Services	2.7	2.5
Durham Region Health Department	2.5	2.4
Eastern Ontario Health Unit	3.5	2.7
Elgin St. Thomas Public Health	11.1	8.0
Grey Bruce Health Unit	5.7	3.8
Haldimand-Norfolk Health Unit	3.2	4.9
Haliburton, Kawartha, Pine Ridge District Health Unit	2.6	3.4
Halton Region Public Health	1.9	2.8
Hastings Prince Edward Public Health	4.4	2.6
Huron County Health Unit	8.2	5.0
Kingston, Frontenac and Lennox & Addington Public Health	3.0	2.0
Lambton Public Health	4.6	2.4
Leeds, Grenville & Lanark District Health Unit	2.6	2.5
Middlesex-London Health Unit	2.9	2.4
Niagara Region Public Health	3.6	3.2

Public Health Unit	7-year-olds[†]	17-year-olds[§]
North Bay Parry Sound District Health Unit	4.0	3.3
Northwestern Health Unit	1.9	1.2
Ottawa Public Health	2.0	1.9
Oxford County Public Health & Emergency Services	11.3	8.1
Peel Public Health	1.7	1.5
Perth District Health Unit	5.7	3.8
Peterborough Public Health	3.5	3.7
Porcupine Health Unit	5.2	2.1
Public Health Sudbury & Districts	3.1	2.8
Region of Waterloo Public Health and Emergency Services	3.1	4.3
Renfrew County and District Health Unit	2.9	3.7
Simcoe Muskoka District Health Unit	4.7	3.0
Thunder Bay District Health Unit	3.4	2.0
Timiskaming Health Unit	2.7	1.4
Toronto Public Health	1.6	1.7
Wellington-Dufferin-Guelph Public Health	3.6	3.9
Windsor-Essex County Health Unit	3.4	2.6
York Region Public Health	2.2	2.0
ONTARIO	2.8	2.5

* Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on the PHO Immunization Coverage webpage.

[†] Includes children with a non-medical exemption submitted due to a conscientious or religious belief for one or more of: measles, mumps, rubella, diphtheria, polio, pertussis, tetanus, MCC or varicella.

[§] Includes children with a non-medical exemption submitted due to a conscientious or religious belief for one or more of: measles, mumps, rubella, diphtheria, polio, tetanus or pertussis.

Table 2. Medical exemptions (%) for at least one disease designated under the *ISPA* in Ontario by age: 2017–18 school year**

Public Health Unit	7-year-olds ^{§§}	17-year-olds [‡]
Algoma Public Health	0.7	0.8
Brant County Health Unit	1.4	0.2
Chatham-Kent Public Health	1.9	1.6
City of Hamilton Public Health Services	0.4	0.1
Durham Region Health Department	0.3	0.1
Eastern Ontario Health Unit	0.4	0.2
Elgin St. Thomas Public Health	0.7	0.5
Grey Bruce Health Unit	0.8	0.3
Haldimand-Norfolk Health Unit	0.5	0.4
Haliburton, Kawartha, Pine Ridge District Health Unit	0.2	0.5
Halton Region Public Health	0.2	0.1
Hastings Prince Edward Public Health	2.5	0.5
Huron County Health Unit	0.2	0.0
Kingston, Frontenac and Lennox & Addington Public Health	2.5	1.1
Lambton Public Health	1.1	0.9
Leeds, Grenville & Lanark District Health Unit	0.7	0.1
Middlesex-London Health Unit	0.1	0.4
Niagara Region Public Health	1.4	0.6
North Bay Parry Sound District Health Unit	0.3	0.1
Northwestern Health Unit	0.3	0.4
Ottawa Public Health	1.5	0.4

Public Health Unit	7-year-olds^{§§}	17-year-olds[‡]
Oxford County Public Health & Emergency Services	1.6	0.6
Peel Public Health	1.1	0.1
Perth District Health Unit	0.5	0.5
Peterborough Public Health	1.0	0.4
Porcupine Health Unit	0.3	0.2
Public Health Sudbury & Districts	0.4	0.1
Region of Waterloo Public Health and Emergency Services	0.9	0.3
Renfrew County and District Health Unit	1.1	0.2
Simcoe Muskoka District Health Unit	1.0	1.0
Thunder Bay District Health Unit	0.4	0.1
Timiskaming Health Unit	0.0	0.0
Toronto Public Health	1.4	0.2
Wellington-Dufferin-Guelph Public Health	0.6	0.2
Windsor-Essex County Health Unit	0.3	0.2
York Region Public Health	0.4	0.2
ONTARIO	0.9	0.3

** Table is available in Microsoft Excel format in the [Immunization Coverage Report Appendix Tables](#) available on the PHO Immunization Coverage webpage.

^{§§} Includes children with a medical exemption submitted due to medical contraindication for one or more of: measles, mumps, rubella, diphtheria, polio, pertussis, tetanus, MCC or varicella.

[‡] Includes children with a medical exemption submitted due to medical contraindication for one or more of: measles, mumps, rubella, diphtheria, polio, tetanus or pertussis.

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