

Introduction

Nova Scotia's publicly funded school-based immunization program offers four vaccines to grade 7 students: 1) Meningococcal Quadrivalent (Men-C-ACYW); 2) Tetanus, Diphtheria, and Acellular Pertussis (Tdap); 3) Human Papillomavirus (HPV); and, 4) Hepatitis B (HB).¹ These vaccines are publicly funded and available to Nova Scotians starting in Grade 7, and youth remain eligible until they turn 19.² Youth who miss or decline these vaccines during the school-based program may receive them through Public Health or through their primary care provider up to this point in time.

Past reports have presented the immunization coverage for these four vaccines based on grade 7 school enrollment. Limiting the analysis to students enrolled in school is useful for evaluating the success of the school-based program but may not adequately reflect the immunization coverage in the population. For this reason, Nova Scotia is moving to an age-based approach, reporting on the immunization coverage among key age groups in the population. A stand-alone report detailing immunization coverage for Men-C-ACYW and HPV vaccines among Nova Scotian youth aged 17 years was released in 2023.

The present report assesses immunization coverage for Men-C-ACYW, Tdap, HPV and HB in youth at age 13 and 17 in 2024.

Key Findings

- In 2024, Nova Scotia's coverage for the four school vaccines ranged from 74.3% (HPV) to 85.2% (Men-C-ACYW) among 13-year-olds.
 - For all of the vaccines, females had higher coverage than males.
 - Among the four health zones, Central Zone had the highest coverage for all of the vaccines, whereas Eastern Zone had the lowest.
 - Coverage for all of the vaccines was higher in 2024 than in 2023. However, it remained lower in 2024 than in 2018-2020, prior to the COVID-19 pandemic.
- In 2024, Nova Scotia's coverage for the four vaccines ranged from 79.2% (HPV) to 85.6% (Men-C-ACYW) among 17-year-olds.
 - For all of the vaccines, females had higher coverage than males. The difference in coverage between males and females was less pronounced among 17-year-olds than among 13-year-olds.
 - Northern Zone had the highest coverage for all of the vaccines compared to all other zones; Western Zone had the lowest.
 - Coverage for all of the vaccines was higher in 2024 than in 2023. Coverage in 2024 was similar to pre-pandemic coverage.
- In both age groups, coverage was higher for the single dose vaccines (Men-C-ACYW and Tdap) than for the multi-dose vaccines (HPV and HB).
- As of 2024, Nova Scotia has not met the national coverage target of 90% by age 17 years² for any of the four vaccines.

¹ More details about the vaccine schedule: [Routine-Immunization-Schedules-for-Children-Youth-Adults.pdf](#)

² More details about the national target: [Vaccination Coverage Goals and Vaccine Preventable Disease Reduction Targets by 2025 - Canada.ca](#)

Methods and Data Notes

Data Sources

Nova Scotia's Public Health Information System, Panorama, was used to retrieve all vaccine records. All vaccines administered by Public Health, including through the school-based program, are recorded in Panorama. Vaccines administered in pharmacies are entered into the Drug Information System (DIS) or CanImmunize³, depending on the vaccine; vaccines administered by primary health care providers are entered into Electronic Medical Record (EMR) systems. Immunization records from DIS, CanImmunize and EMRs are integrated into Panorama from their respective systems.

Statistics Canada population estimates were used in the denominator to calculate coverage.

Data were downloaded from Statistics Canada on January 9th, 2025. Data were pulled from Panorama on January 15th, 2025.

Coverage Estimation

Full series coverage represents the percentage of people who received the specified number of doses (based on the vaccine product received) for completion of the vaccine series, among all individuals who were eligible to receive it. Eligible individuals include all Nova Scotians aged 13 or 17 years in 2024 for each of the analyses, respectively.

$$\text{Coverage (\%)} = 100 * \frac{\# \text{ completed vaccine series (numerator)}}{\# \text{ eligible (denominator)}}$$

The analysis in 13-year-olds included immunization by December 31st of the year in which individuals turn 13. Immunizations through the school program are typically received in the winter of the year of the individual's 13th birthday and/or the fall of the previous year (i.e., during their 12th year), depending on the vaccine. Therefore, school vaccines given in the 6 months following the end of the grade 7 school year would be included. These vaccines would likely be given through catch-up school vaccine clinics in the summer months or the beginning of the grade 8 school year. These immunizations could also have been received by a primary care provider. The analysis in 17-year-olds included immunization by December 31st of the year in which individuals turned 17. Typically, these individuals would have received their immunizations in the school-based program in grade 7. However, Nova Scotians can receive them through public health catch-up programs or by their primary care provider up until the individual is no longer eligible at age 19.

Series initiation represents the percentage of people who received at least one dose of the vaccine of interest, regardless of whether they completed the series, among all individuals who were eligible to receive it. These data were only provided if the vaccine series required more than a single dose (i.e., HPV and HB vaccines). The percentage of people who completed the series among those who initiated was also calculated.

Numerator:

- For the 13-year-old analysis in 2024, the number of individuals born in 2011 who had received the specified number of doses prior to, or on, December 31st, 2024, was used. To understand trends over time (2018-2023), individuals born from 2005-2010 who received the specified number of doses prior to, or on, December 31st of the year of their 13th birthday was used.

³ CanImmunize is a platform for booking immunization appointments and digitally filing vaccine records. Nova Scotia has implemented use of this platform initially for COVID and influenza vaccines, but other publicly funded vaccines have been added. These records are uploaded into Panorama if they are not otherwise captured.

- For the 17-year-old analysis, the number of individuals born in 2007 who had received the specified number of doses prior to, or on, December 31st, 2024, was used. To understand trends over time (2020-2023), the number of individuals born from 2001-2006 who received the specified number of doses prior to, or on, December 31st of the year of their 17th birthday was used. Note that the analysis of trends over time among 17-year-olds does not extend as far back in time as that of 13-year-olds. This is due to gaps in the data available for this group in earlier years.

Denominator: The mid-year Statistics Canada population estimate of Nova Scotians from 2018 to 2024 ages 13 or 17 years were used for each analysis, respectively.⁴ The 2023 mid-year Statistics Canada population estimates were used for the 2024 analyses broken down by health zone⁵, since 2024 data at this level were not yet available at the time of analysis.

Age at Immunization: The data presented in this report include individuals who received vaccines within a specified age range. The percentage of individuals who completed their vaccine series in that age range was calculated as follows:

$$\text{Percentage in age category (\%)} = 100 * \frac{\text{\# individuals who completed vaccine series within specified age range}}{\text{total \# individuals who completed vaccine series}}$$

- **Prior to 11 years of age:** Series completed after the lower age limit for eligibility and prior to the individual's 11th birthday. This estimates the percentage of 13-year-olds who received the immunizations prior to the grade 7 school-based program.
- **From ages 11 to 13 years:** Series completed on or after the individual's 11th birthday and before December 31st, 2024. This estimates the percentage of 13-year-olds who received the immunizations during the grade 7 school-based program or at a later time.
- **Prior to 14 years of age:** Series completed after the lower age limit for eligibility and prior to the individual's 14th birthday. This estimates the percentage of 17-year-olds who received the immunizations during, or prior to, the grade 7 school-based program.
- **From ages 14 to 17 years:** Series completed on or after the individual's 14th birthday and before December 31st, 2024. This estimates the percentage of 17-year-olds who received the immunizations after the grade 7 program.

Health Zone: Health zone was assigned using the postal code of the individual registered with Public Health. If no postal code was available for the individual, the postal code of the service delivery location was used.

Target Coverage: The Public Health Agency of Canada has set the immunization coverage goals of 90% by age 17 for these four vaccines.⁶

Agent Specific Details

This report includes records of the four vaccines received through the school program. It also includes records of vaccines received outside of the school program using either the same vaccine product or other vaccine products offering protection against the same diseases. The table below summarizes the inclusion criteria and the definitions of series completion for each agent.

⁴ [Population estimates on July 1, by age and gender](#)

⁵ [Population estimates, July 1, by health region and peer group, 2023 boundaries](#)

⁶ [Vaccination Coverage Goals and Vaccine Preventable Disease Reduction Targets by 2025 - Canada.ca](#)

Immunizing agent	Inclusion Criteria and Definition of Series Completion
Men-C-ACYW	A single dose is required to complete the vaccine series. Doses received at 9 years of age or older were included.
Tdap	A single dose is required to complete the vaccine series, as long as the primary series has been received. Doses received at 7 years of age or older were included.
HPV	<p>Public Health administers HPV-9 as part of the school-based program. If HPV-9 was received and the series was started before age 15 years, two doses are required to complete the series. If the series was started after age 15 years, three doses are required to complete the series. Doses received at 9 years of age or older were included.</p> <p>Alternatively, individuals could have received HPV-2 or HPV-4. These series have the same dose requirements as the HPV-9 series. Doses received at 9 years of age or older were included.</p>
HB	<p>Public Health administers a monovalent HB vaccine as part of the school-based program. If a monovalent HB vaccine was received after the age of 11, two doses were required to complete the series. An individual could have also received monovalent HB prior to age 11, in which case three doses were required to complete the series.</p> <p>Alternatively, individuals could have received a hepatitis A and B combination vaccine, which requires two or three doses to complete the vaccine series, using the same age criteria as above. Individuals may have also received DTaP-HB-IPV-Hib or DTaP-IPV-HB, of which three doses were required to complete the series. Doses received before age 7 were included.</p>

Data Limitations and Interpretation

This report reflects coverage for Men-C-ACYW, Tdap, HPV and HB immunization among youth who were ages 13 or 17 years in Nova Scotia on December 31st 2018-2024. Only vaccines recorded in Panorama were included in these analyses. All vaccines administered through the school-based immunization program or by Nova Scotia Public Health are routinely recorded in Panorama; this accounts for the majority of vaccines included in these analyses. Vaccines administered in pharmacies recorded in the DIS and in the CanImmunize system are also uploaded to Panorama. Although records for vaccines delivered by primary health care providers outside of Public Health are integrated into Panorama through EMRs, upload failures and missing records are possible. Additionally, historical data for immunizations administered before EMR systems were integrated into Panorama may be missing. Other reasons for missing records in Panorama include delays in data entry of immunization records provided to Public Health and vaccines administered in other provinces or countries. Missing vaccine data would result in an underestimation of coverage. Furthermore, vaccine records may be more complete for those who were immunized in previous years compared to 2024, as there is a longer time period for their vaccine records to be uploaded into Panorama.

The analyses included immunization by December 31st of the year in which individuals turned 13 or 17, meaning that any immunization received at age 13 or 17 after that date would not be included. This may underestimate the number of immunizations given to individuals in each of the age groups. In the analyses among 17-year-olds, individuals would have had since their grade 7 year up until the year of their 17th birthday to receive their immunizations.

Of note, Nova Scotia's population has been increasing in the years included in this report and it is likely that some clients at age 13 or 17 were immunized outside of Nova Scotia. Migration patterns were differential by

health zone, with Central Zone experiencing the greatest level of in-migration during the period. Their records may not be included in the numerator, resulting in an underestimation of coverage. This increase in population may also explain why coverage at age 17 was at times lower than coverage at 13 among the same group of individuals (e.g. Men-C-ACYW coverage among 17-year-olds in 2024 was lower than Men-C-ACYW coverage among 13-year-olds in 2020). Although the total number of vaccine records in Panorama (i.e. the numerator) increased as youth got older, the total population of youth (i.e. the denominator) increased to a greater proportion, leading to a lower calculated coverage. It is also possible that some individuals who were not Nova Scotia residents received the vaccine in Nova Scotia. In this case, they would be a part of the numerator but not the denominator, leading to a potential overestimate in coverage.

Only a single dose of Tdap received after age 7 was assessed in this report, with the assumption that the primary series doses were received in childhood, which could lead to an overestimation of Tdap coverage in Nova Scotia.

The denominator used to calculate coverage was the Statistics Canada population estimate, which is based on census data. This population estimate may not accurately estimate the number of people in Nova Scotia who are eligible for immunization. This would result in an under- or overestimation in coverage depending on whether the population was over- or underestimated, respectively. Since the denominator is an aggregate estimate based on census data, it is not possible to ensure all individuals in the numerator are included in the denominator.

The methodology used in this report differs from those in the previous school-based immunization reports on grade 7 students, which used student lists from the Department of Education for the denominator. It is, therefore, not possible to make direct comparisons between the coverage reported in each of these reports.

Coverage in 13-Year-Old Youth in Nova Scotia

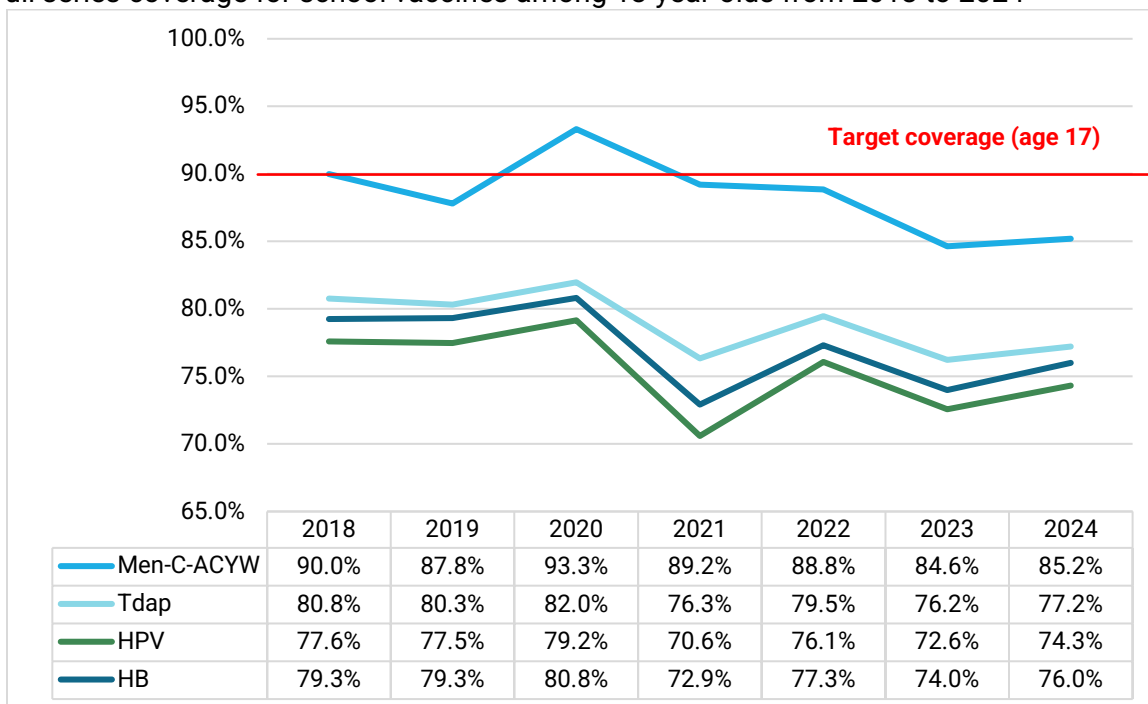
Table 1: Nova Scotia coverage for school vaccines at age 13 in 2024

	Coverage (%)			
	Men-C-ACYW	Tdap	HPV	HB
Full Series	85.2	77.2	74.3	76.0
Series Initiation	n/a	n/a	82.7	86.2

Comments:

- Coverage was notably higher for the Men-C-ACYW vaccine compared to all other school vaccines in 2024.

Figure 1: Full series coverage for school vaccines among 13-year-olds from 2018 to 2024



Comments:

- The Men-C-ACYW vaccine had the highest coverage throughout the reporting period, while HPV had the lowest. This is consistent with the expectation of single-dose series showing higher completion than multi-dose series.
- Coverage for Tdap, HPV and HB vaccines was relatively stable from 2018-2020 and decreased in 2021, likely due to the impact of the COVID-19 pandemic on vaccine delivery. Coverage has increased gradually since then.
- Coverage for Men-C-ACYW was highest in 2020, then decreased in subsequent years.
- Although vaccine coverage increased from 2023 to 2024, coverage was lower in 2024 for all school vaccines compared to 2018-2020, suggesting that coverage had not recovered to pre-pandemic levels.

Men-C-ACYW Immunization Coverage

Statistics Canada estimated the population of 13-year-olds in Nova Scotia in 2024 to be 10,704 individuals. Among them, 9119 (85.2%) received the Men-C-ACYW vaccine by December 31st, 2024 (Table 1; Figure 2). Of those immunized, 99.8% received the vaccine from ages 11 to 13 years, and 0.2% received it from ages 9 to < 11 years. Central Zone had the highest coverage (90.2%), while Eastern Zone had the lowest (76.8%) (Figure 2). The coverage for Men-C-ACYW in females in was higher than in males (86.8 verses [vs] 83.7%) (Figure 3).

Figure 2: Men-C-ACYW immunization coverage by health zone in 2024

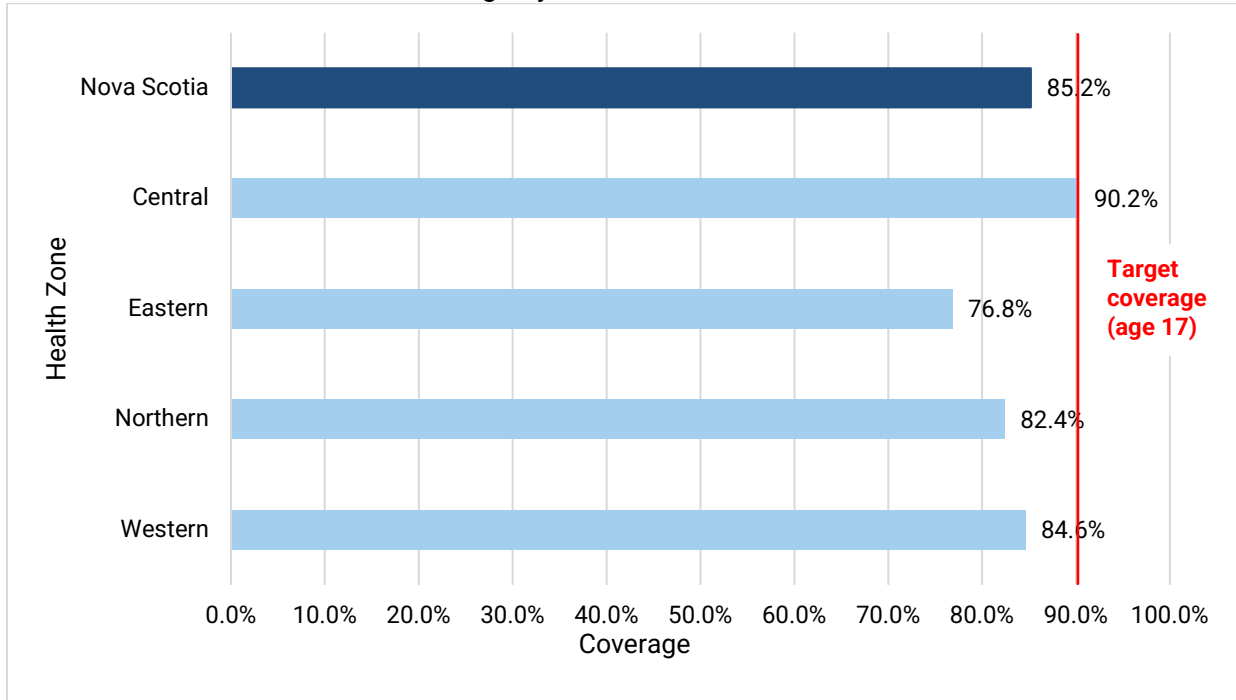
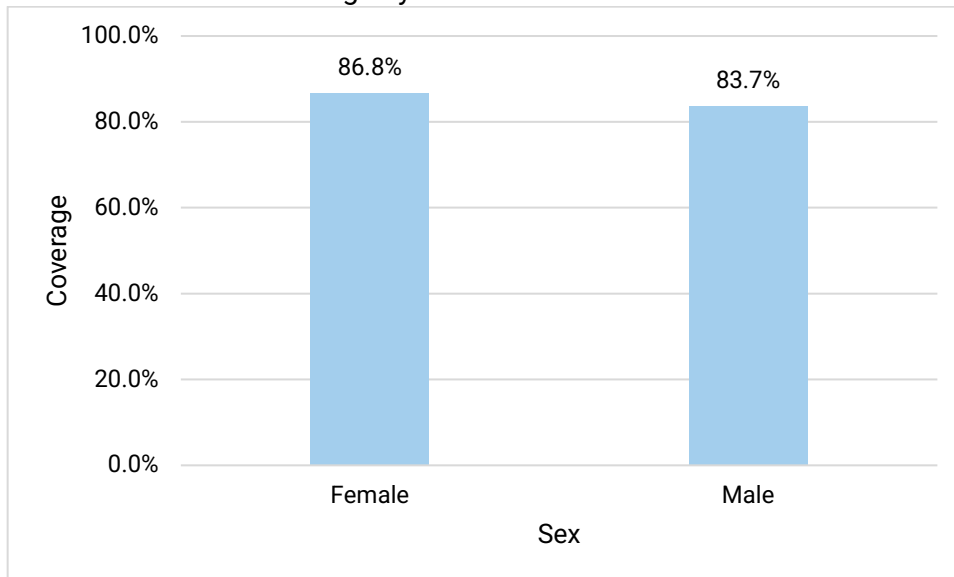


Figure 3: Men-C-ACYW immunization coverage by sex in 2024



Tdap Immunization Coverage

In total, 8,264 13-year-olds received the Tdap vaccine, for a coverage for 77.2% in 2024 (Table 1; Figure 4). Of those immunized, 99.3% received the vaccine from ages 11 to 13 years, and 0.7% received it from ages 7 to < 11 years. Central Zone had the highest coverage (83.7%) while Eastern Zone had the lowest (64.4%) (Figure 4). The coverage in females was higher than in males (80.1% vs. 74.5%) (Figure 5).

Figure 4: Tdap immunization coverage by health zone in 2024

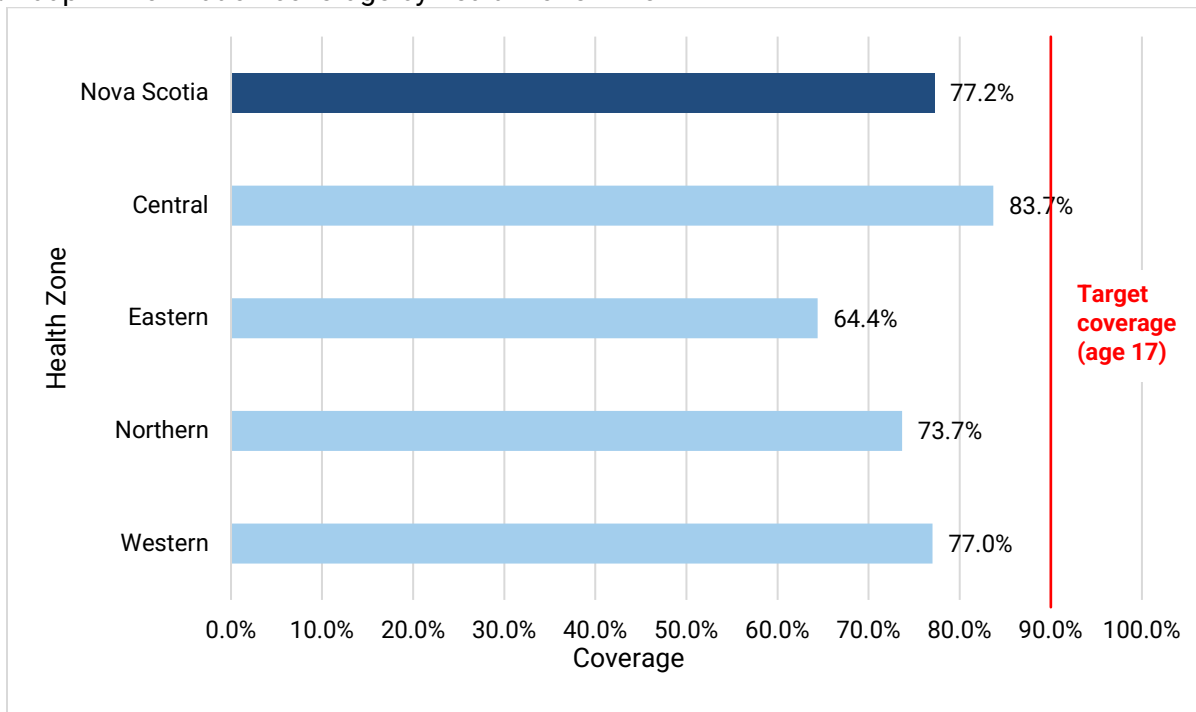
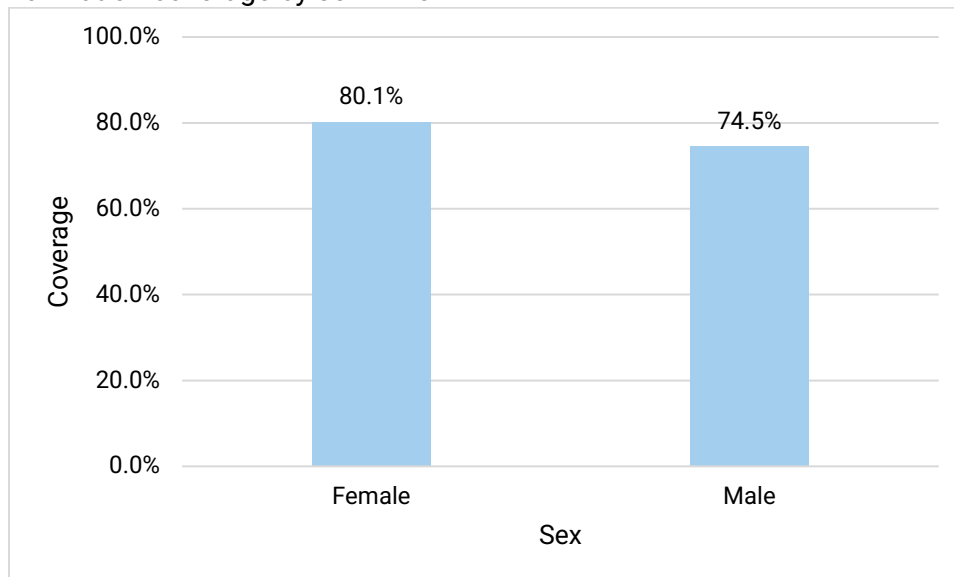


Figure 5: Tdap immunization coverage by sex in 2024



HPV Immunization Coverage

Overall, HPV coverage was the lowest among the four vaccines included in this report. In total, 7956 13-year-olds completed the HPV vaccine series, for a coverage of 74.3% in 2024 (Table 1; Figure 6). Of those immunized, 99.97% completed the HPV series at the age of 11 or older and 0.03% completed it prior. A total of 8856 13-year-olds (82.7%) initiated the HPV vaccine series, of whom 89.8% completed it. Central Zone had the highest coverage (80.3%) while Eastern Zone had the lowest (63.4%) (Figure 6). The coverage in females was higher than in males (77.3% vs. 71.5%) (Figure 7).

Figure 6: HPV full series immunization coverage by health zone in 2024

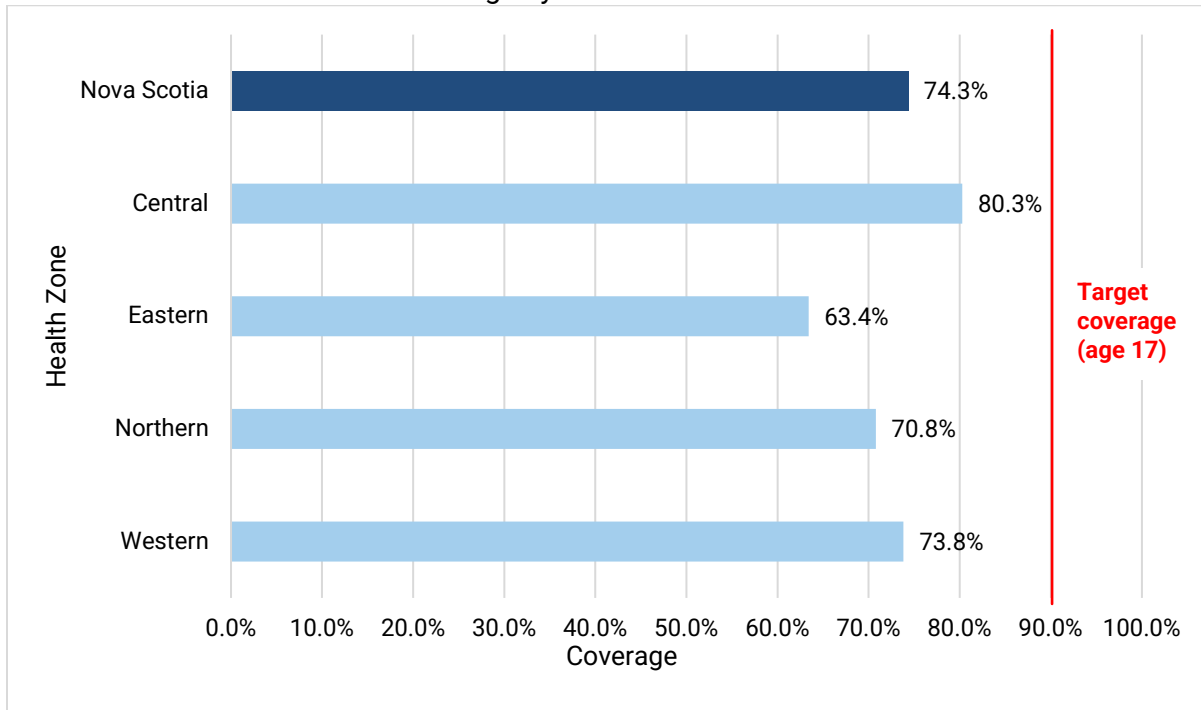
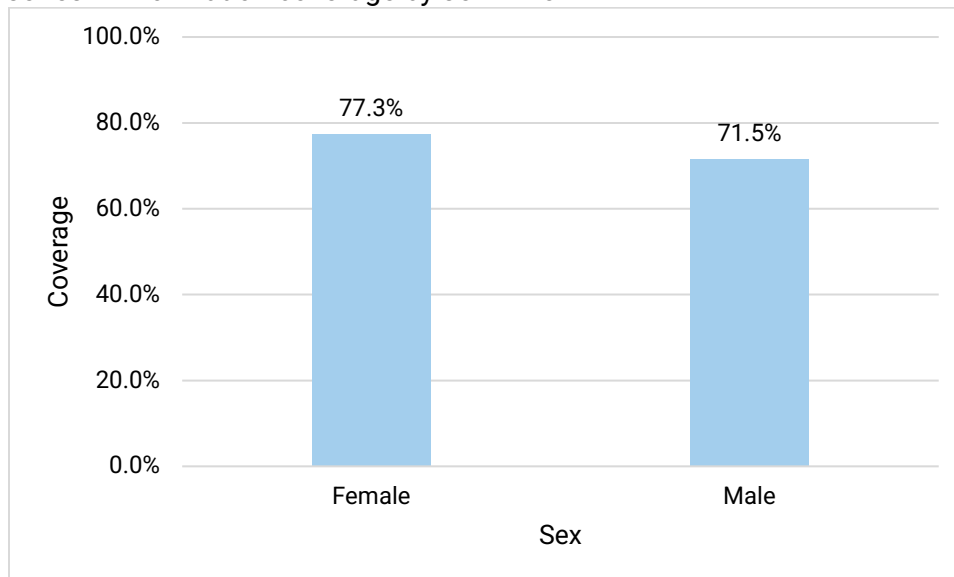


Figure 7: HPV full series immunization coverage by sex in 2024



HB Immunization Coverage

In total, 8135 13-year-olds completed the HB vaccine series, for a coverage of 76.0% in 2024 (Table 1; Figure 8). Of those immunized, 93.5% completed the HB series from ages 11 to 13 years, and 6.5% completed it prior. A total of 9227 13-year-olds (86.2%) initiated the HB series, of whom 88.2% completed it. Central Zone had the highest coverage (82.3%) while Eastern Zone had the lowest (63.9%) (Figure 8). The coverage in females was higher than in males (78.5% vs. 73.7%) (Figure 9).

Figure 8: HB full series immunization coverage by health zone in 2024

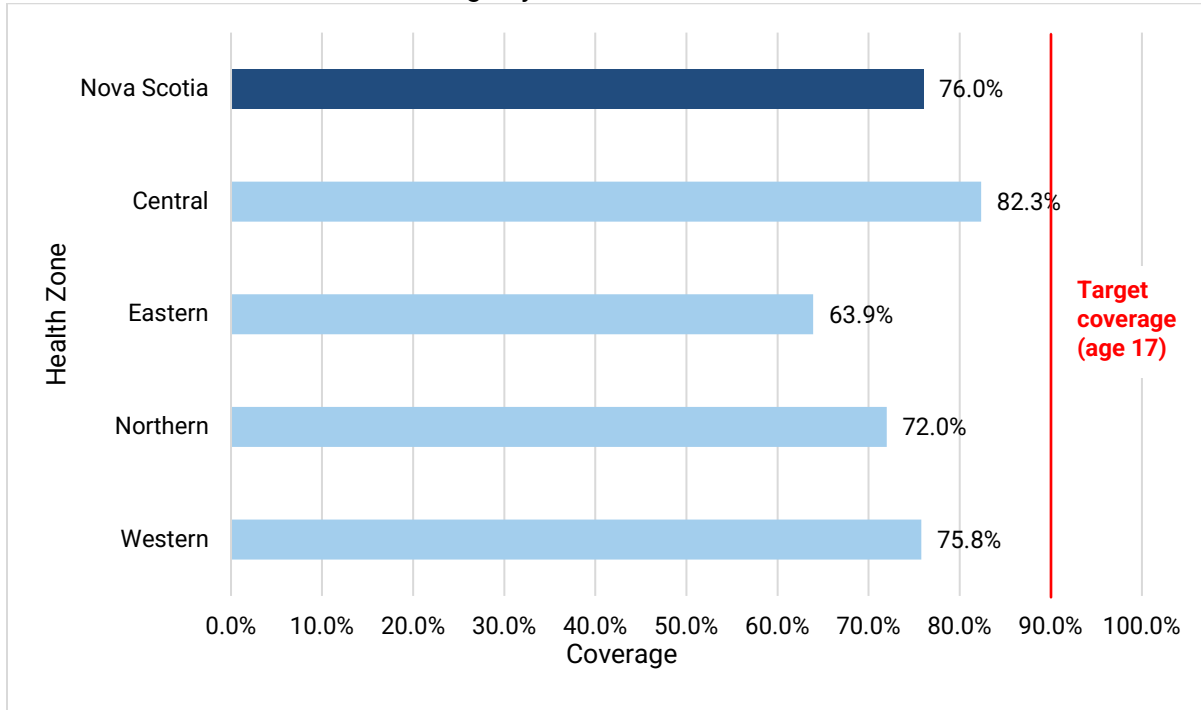
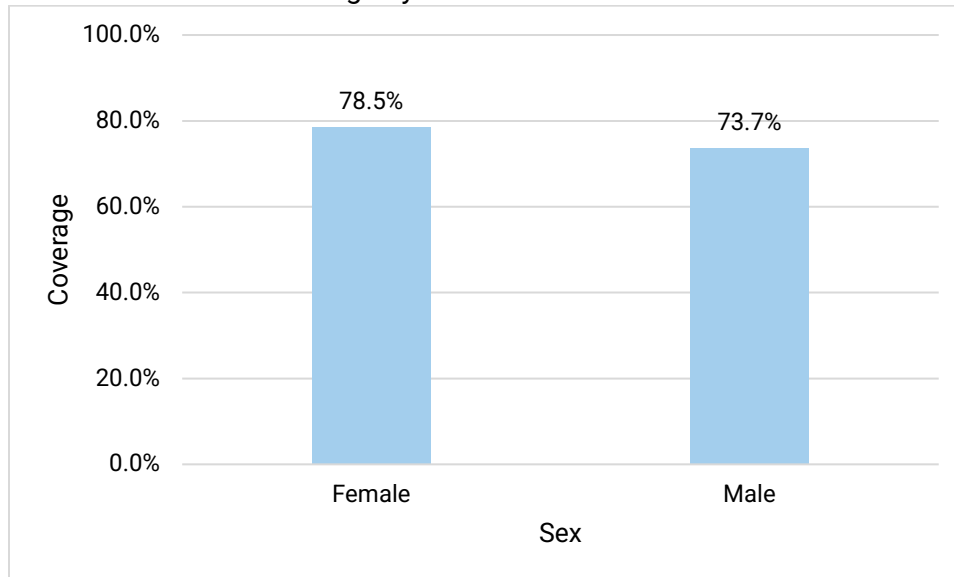


Figure 9: HB full series immunization coverage by sex in 2024



Coverage in 17-Year-Old Youth in Nova Scotia

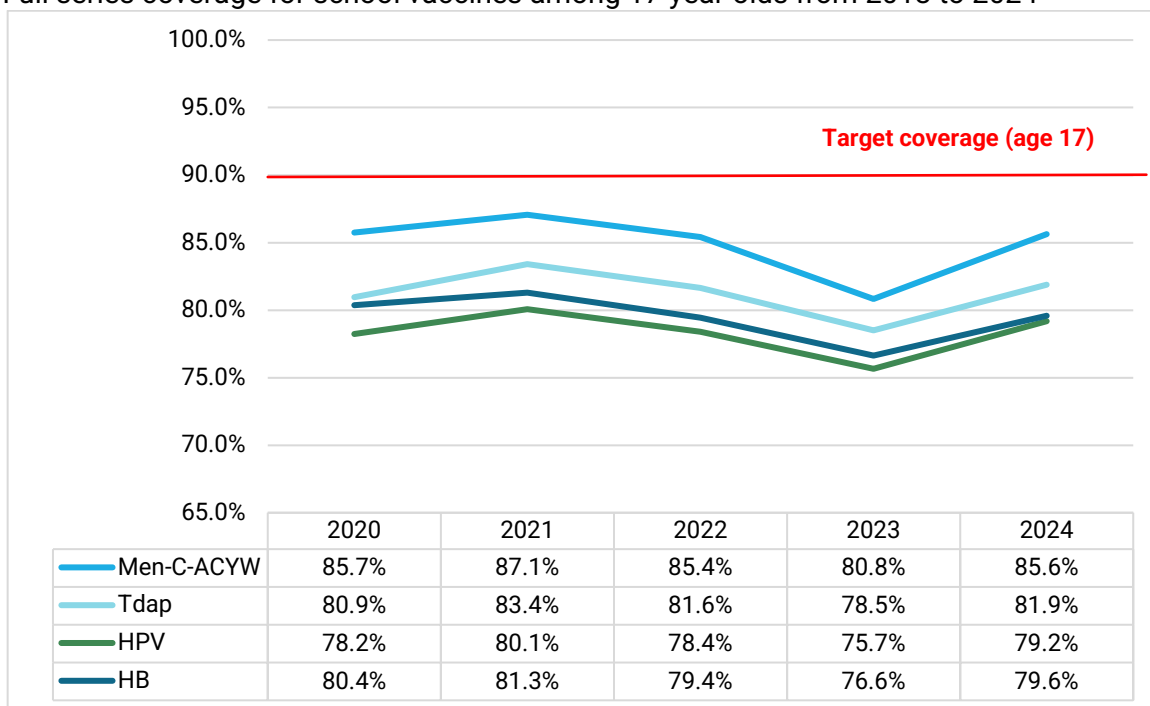
Table 2: Nova Scotia coverage for school vaccines at age 17 in 2024

	Coverage (%)			
	Men-C-ACYW	Tdap	HPV	HB
Full Series	85.6	81.9	79.2	79.6
Series initiation	n/a	n/a	83.4	86.1

Comments:

- Men-C-ACYW coverage was the highest of all school vaccines in 2024.
- HPV and HB immunization coverage was lower than Men-C-ACYW and Tdap coverage. This is consistent with the expectation of single-dose series showing higher completion than multi-dose series.

Figure 10: Full series coverage for school vaccines among 17-year-olds from 2018 to 2024



Comments:

- As of 2024, the national vaccine target coverage of 90% in adolescents by age 17 years has not yet been met for any of the four school vaccines⁷. However, this 17-year-old group was closer overall to the target than the 13-year-old group.
- Like the 13-year-old age group, the Men-C-ACYW vaccine had the highest coverage throughout the reporting period, while HPV had the lowest. This is consistent with the expectation of single-dose series showing higher completion than multi-dose series.
- The coverage pattern over this reporting period was similar for all four vaccines. Coverage was relatively stable from 2020 to 2021, with a decline in 2022 and 2023, and a subsequent increase in 2024. Coverage in 2024 was comparable to coverage in 2020 for all four vaccines, suggesting that coverage has recovered to pre-pandemic levels.
- Overall, there was less variation in coverage across the reporting period compared to the age 13-year-old analysis. This may be because COVID-19 school closures did not affect receipt of vaccines during the school program, as 17-year-olds in these groups would have been eligible for the school program in pre-pandemic years.

⁷ [Vaccination Coverage Goals and Vaccine Preventable Disease Reduction Targets by 2025 - Canada.ca](https://www.canada.ca/en/health-canada/services/vaccines-and-immunization/immunization/vaccination-coverage-goals-and-vaccine-preventable-disease-reduction-targets-by-2025.html)

Men-C-ACYW Immunization Coverage

Statistics Canada estimated the population of 17-year-olds in Nova Scotia in 2024 to be 10,469 individuals. Among them, 8,964 (85.6%) received the Men-C-ACYW vaccine by December 31st, 2024 (Table 2, Figure 11). Of those immunized, 97.8% received their Men-C-ACYW vaccine from ages 9 to < 14 years and 2.2% received it from ages 14 to 17 years. Northern Zone had the highest coverage (89.7%) meeting the national coverage target, while Western Zone had the lowest (80.3%) (Figure 11). The coverage for Men-C-ACYW in females was higher than in males (86.3% vs. 85.0%) (Figure 12).

Figure 11: Men-C-ACYW immunization coverage by health zone in 2024

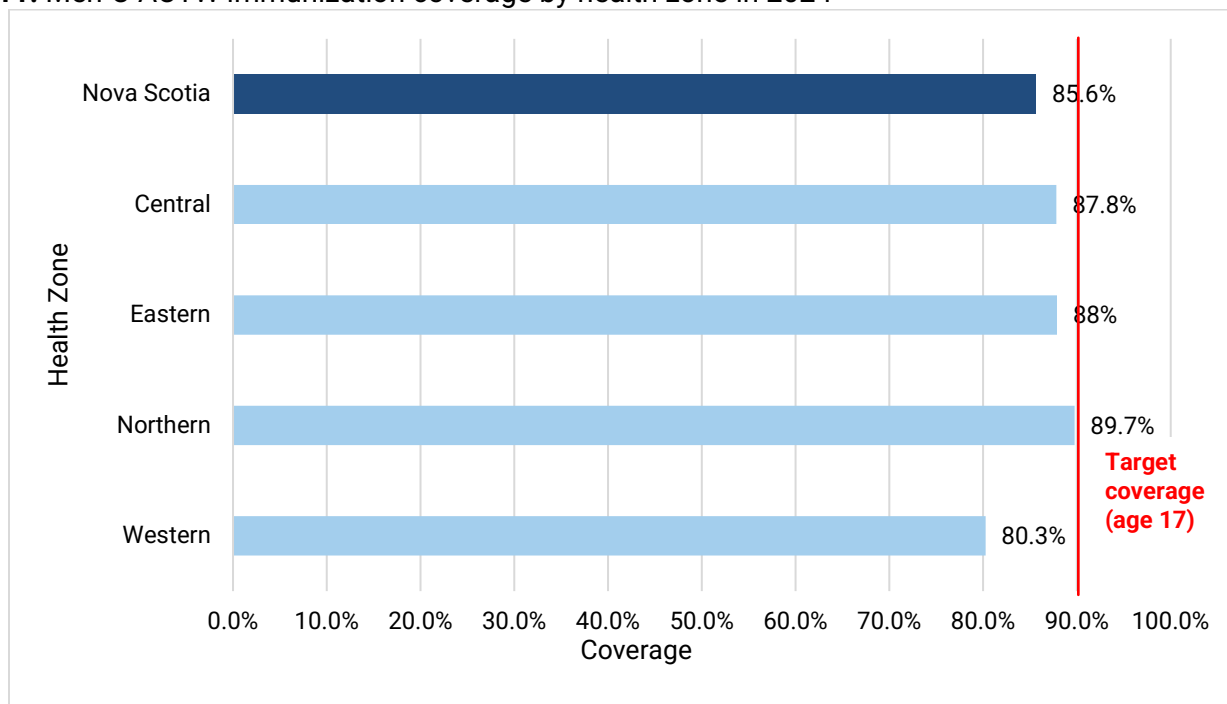
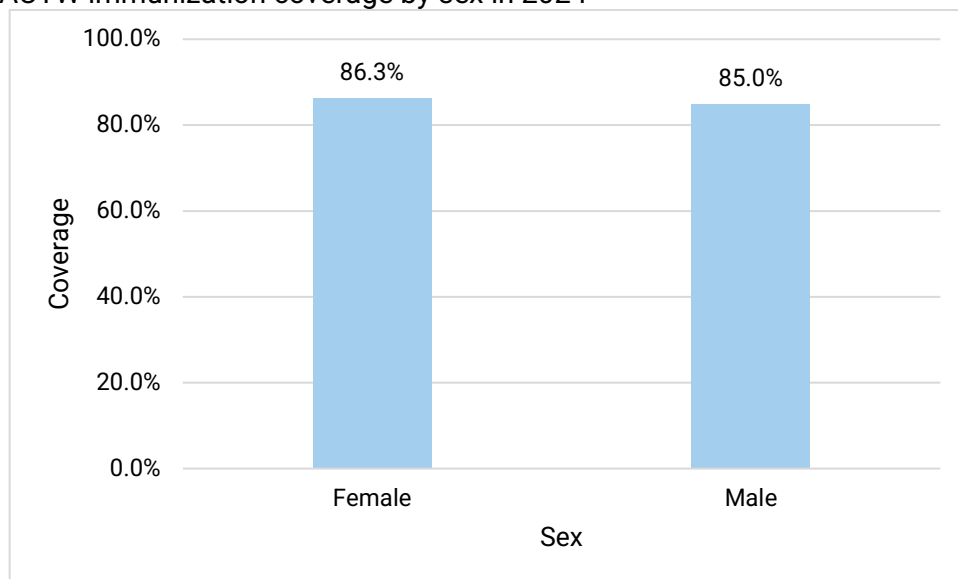


Figure 12: Men-C-ACYW immunization coverage by sex in 2024



Tdap Immunization Coverage

In total, 8,573 17-year-olds received the Tdap vaccine, for a coverage of 81.9% in 2024 (Table 2; Figure 13). Of those immunized, 92.6% received their Tdap vaccine from ages 7 to < 14 years, and 7.4% received it from ages 14 to 17 years. Northern Zone had the highest coverage (88.0%) approaching the national coverage target, while Western Zone had the lowest (74.4%) (Figure 13). The coverage in females was higher than in males (82.6% vs. 81.3%) (Figure 14).

Figure 13: Tdap immunization coverage by health zone in 2024

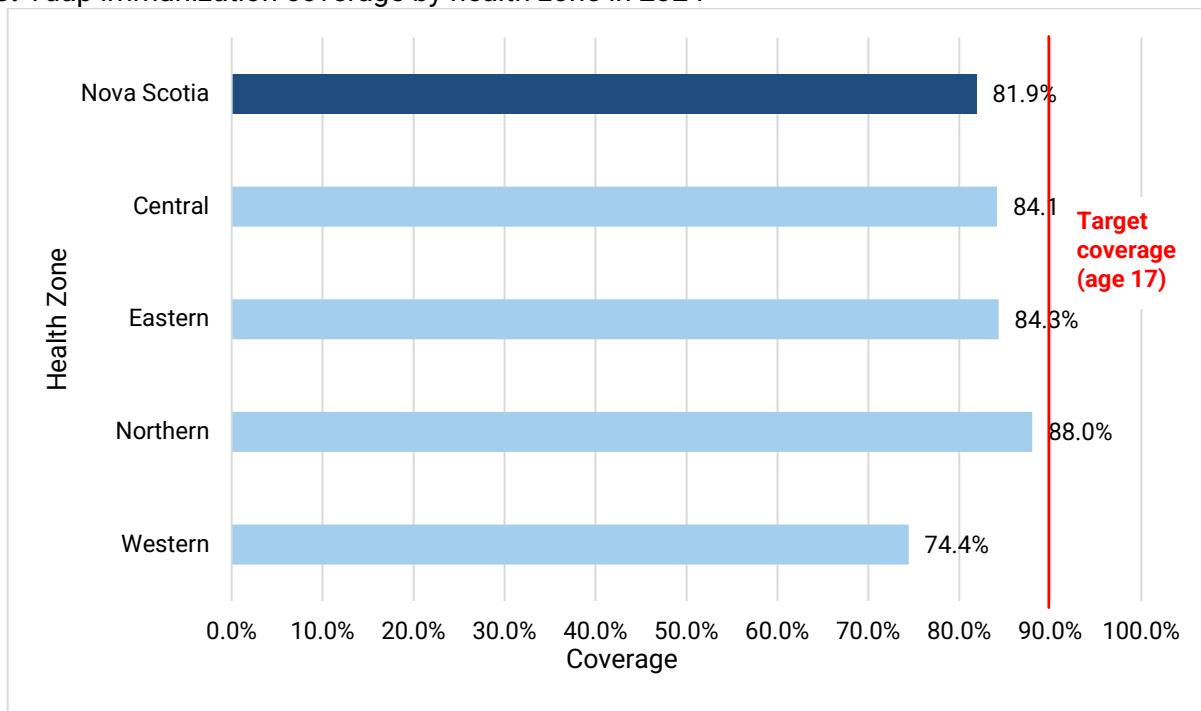
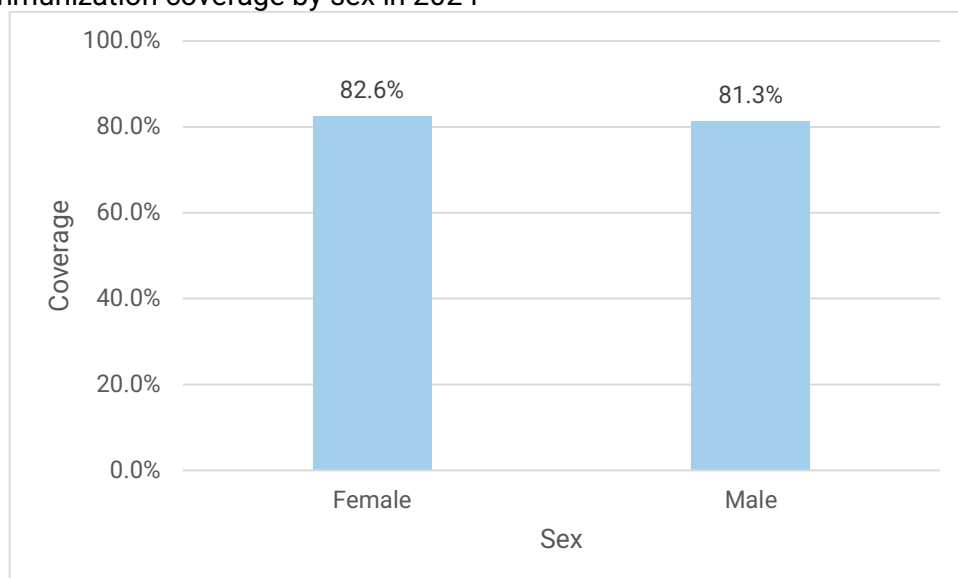


Figure 14: Tdap immunization coverage by sex in 2024



HPV Immunization Coverage

Overall, HPV coverage was the lowest among the four vaccines included in this report. In total, 8290 17-year-olds had completed the HPV vaccine series, for a coverage of 79.2% in 2024 (Table 2; Figure 15). Of those immunized, 92.6% completed the HPV series from ages 9 to <14 years and 7.4% completed from ages 14 to 17 years. A total of 8734 of 17-year-olds (83.4%) initiated the HPV vaccine series, of whom 94.9% completed it. Northern Zone had the highest coverage (84.2%) while Western Zone had the lowest (71.9%) (Figure 15). The coverage in females was higher than in males (79.9% vs. 78.5%) (Figure 16).

Figure 15: HPV full series immunization coverage by health zone in 2024

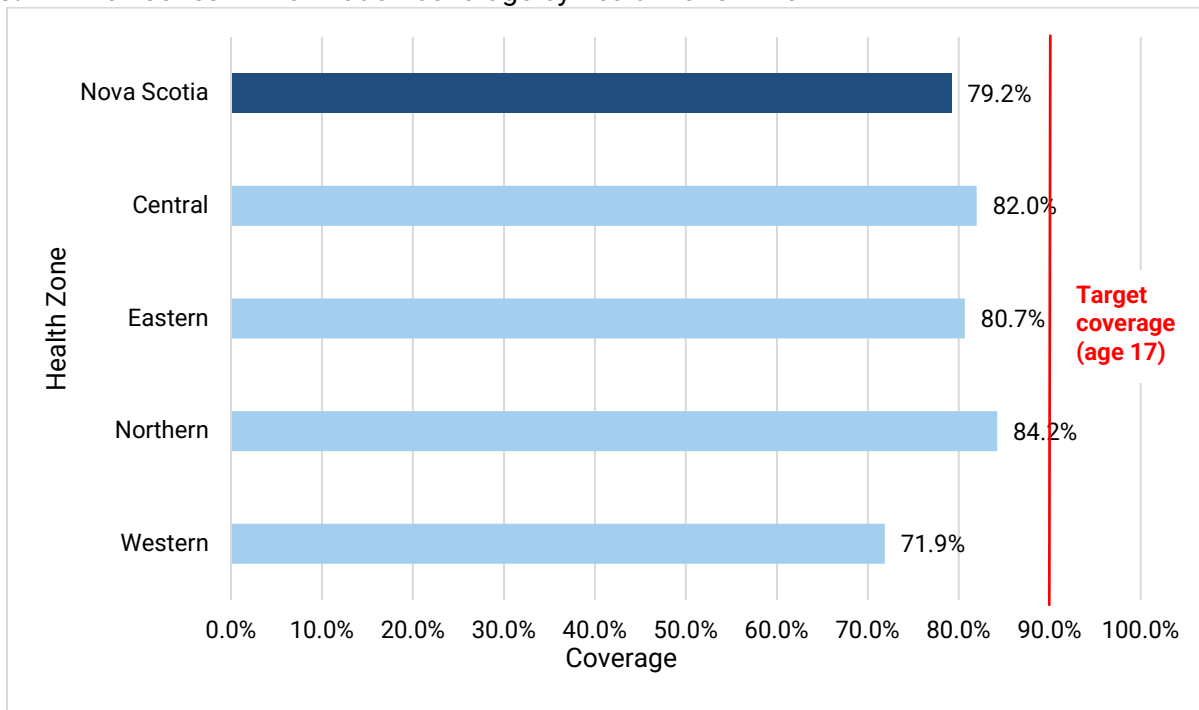
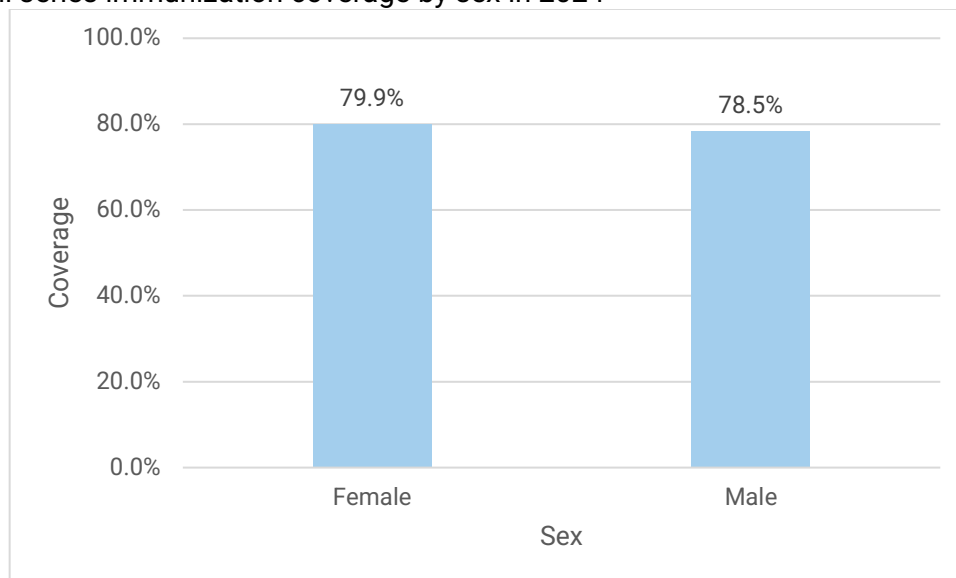


Figure 16: HPV full series immunization coverage by sex in 2024



HB Immunization Coverage

In total, 8,332 17-year-olds had completed the HB vaccine series, for a coverage of 79.6% in 2024 (Table 2; Figure 17). Of those immunized, 93.5% completed the HB series prior to age 14, and 6.5% completed from ages 14 to 17 years. A total of 9010 17-year-olds (86.1%) initiated the HB series, of whom 92.5% completed it. Northern Zone had the highest coverage (83.7%) while Western Zone had the lowest (71.2%) (Figure 17). The coverage in females and males was similar (80.0% vs. 79.2%) (Figure 18).

Figure 17: HB full series immunization coverage by health zone in 2024

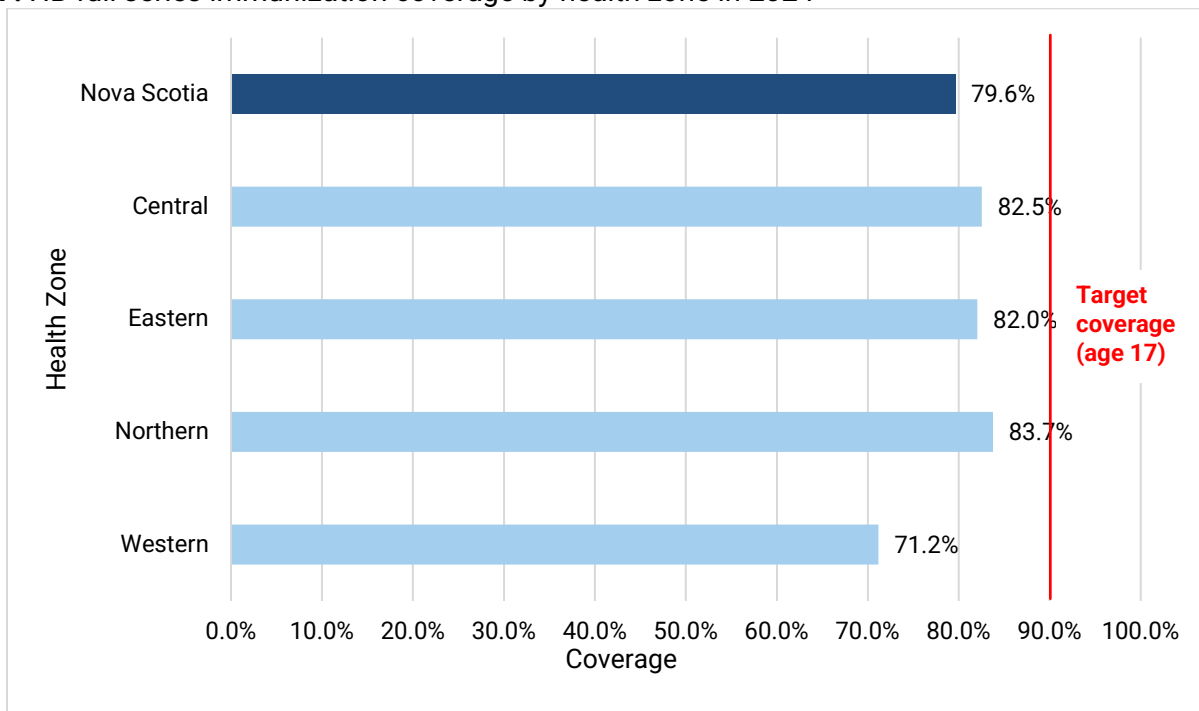


Figure 18: HB full series immunization coverage by sex in 2024

