

School Based Immunization Coverage in Nova Scotia: Report on the 2022-2023 School Year



Introduction

Nova Scotia's publicly funded school-based immunization program offers four vaccines to grade seven students. Public Health partners with local school boards, and nurses deliver these vaccines in schools during two immunization clinics, occurring in the fall and in the spring¹. The four vaccines are administered according to the schedule in the table below.²

Immunization	# of Doses	Fall Term	Spring Term
Meningococcal Quadrivalent (Men-C-ACYW)	1	✓	
Tetanus, Diphtheria, and Acellular Pertussis (Tdap)	1		✓
Human Papillomavirus (HPV)	2	✓	✓
Hepatitis B (HB)	2	✓	✓

If a student is absent or unable to receive a vaccine during one of the school clinics, nurses can administer the missed vaccine at the next clinic. Public Health also organizes catch-up programs throughout the year. To account for the timing of vaccine administration, this report presents the immunization coverage of these four vaccines for Nova Scotia students enrolled in public schools for the **2022-2023 grade seven cohort, as of December 31 of their grade eight year (i.e. December 31, 2023)**.

Although typically received in grade seven as part of the school-based immunization program, there are circumstances where some of these vaccines may be received outside of the school program. For example, Nova Scotia publicly-funds hepatitis B immunization in infancy for those at higher risk, students may receive a hepatitis A and B combination vaccine prior to travel, or students may receive a Tdap booster as part of wound management. Students who received these vaccines at any point prior to December 31, 2023, are included in the coverage presented in this report.

Methods and Data Notes

Data Sources: The data source for school-based immunization coverage is Public Health's Information System, Panorama. Historical coverage estimates prior to 2018 were generated using data from Public Health's previous information systems, the Application for Notifiable Disease Surveillance (ANDS) and the Application for Notifiable Disease Surveillance and Immunization (ANDI).

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.

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

¹ More information on the school-based immunization program can be found under "School Immunization Program": [Immunizations | Nova Scotia Health \(nshealth.ca\)](https://www.nshealth.ca/immunizations)

² More details about the vaccine schedule: [Routine-Immunization-Schedules-for-Children-Youth-Adults.pdf \(novascotia.ca\)](https://www.novascotia.ca/routine-immunization-schedules-for-children-youth-adults.pdf)

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Partial immunization coverage, or 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 are only provided if the vaccine series requires more than a single dose. The proportion of people who completed the series among those who initiated is also calculated.

Numerator: The number of public-school students in grade seven in the 2022-2023 school year, who have received the specified number of doses (based on the vaccine product received), on or before December 31, 2023.

Agent specific details:

- **Meningococcal Quadrivalent (Men-C-ACYW)** – A single dose is required to complete the vaccine series. Doses received prior to Dec. 31, 2023, are included if received at 8 years of age or older.
- **Tetanus, Diphtheria, Acellular Pertussis (Tdap)** – A single dose is required to complete the vaccine series. Doses received prior to Dec. 31, 2023, are included if received within the 5 years prior to the start of their grade 7 school year (i.e. before September 1, 2017).
- **Human Papillomavirus (HPV)** – Two doses are required to complete the vaccine series. Doses received at any time prior to December 31, 2023, are included.
- **Hepatitis B (HB)** – A monovalent hepatitis B vaccine is offered in the school-based program, which requires two doses to complete the vaccine series. Other monovalent hepatitis B vaccines and the hepatitis A and B combination vaccine are also available and require two or three doses (agent dependent) to complete the vaccine series. Immunization with any of these agents at any time prior to December 31, 2023, was included in the report and full series coverage was evaluated based on the dose requirements of the agent received.

Denominator: The total number of public-school students in grade seven in the 2022-2023 school year.

For Nova Scotia public schools, student information (e.g. grade, school) is uploaded monthly from the Department of Education and Early Childhood Development's Student Information System into Panorama. In late August, the current school year information is overwritten with the new school year information. For the 2022-2023 cohort, the data for public-school students were pulled in February 2024, meaning that data in Panorama have been overwritten with the 2023-2024 school year's data. Therefore, data were pulled for students in grade 8 in the 2023-2024 school year as an estimate for those in grade 7 in the 2022-2023 school year.

Timing of Immunization: The data presented in this report include individuals who received immunizations in any of the categories below, based on the timing of their immunization. The proportion of individuals who completed their vaccine series by these time points is calculated as follows:

$$\text{Proportion in category (\%)} = 100 * \frac{\text{\# individuals in category who completed vaccine series}}{\text{total \# individuals who completed vaccine series}}$$

- **Prior to Grade Seven**: Series completed prior to September 1 of the student's grade 7 school year (i.e. September 1, 2022), within the eligibility periods described above (see *Agent specific details*).
- **Grade Seven**: Series completed between September 1 and August 31 (inclusive) of the student's grade 7 school year (i.e. between September 1, 2022, and August 31, 2023).

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- **Grade Eight:** Series completed between September 1 and December 31 (inclusive) of the student's grade 8 school year (i.e. between September 1, 2023, and December 31, 2023).

In reporting cycles prior to 2018-19, only students covered within the grade seven school year were reported.

Health Zone: Health zone was assigned based on the location of the student's school.

Private School & Home-Schooled Students: Based on the methods and timing of the data pull, reliable numbers for private schools and home-schooled students were not available and are not included.

Data Limitations

This report reflects coverage for grade 7 cohorts at a specific point in time, December 31st of the grade 8 school year. Students who completed their series after December 31 of their grade 8 year are not included. This is particularly notable for the 2019/20 and 2020/21 grade 7 cohorts. Due to pandemic-related school closures during these years, coverage during those years was lower than in previous years. Public Health has made efforts to offer catch up beyond December 31st of the grade 8 year, which has subsequently improved the coverage.

Any immunizations that are not recorded in Panorama will not contribute to the coverage. All immunizations administered through the school-based program or by Nova Scotia Public Health are routinely recorded in Panorama, accounting for the group who administers most of these vaccines. Records for immunizations delivered through pharmacies and immunizations recorded in the CanImmunize system³ are also uploaded to Panorama. Although the records for immunizations that are delivered by health care providers outside of Public Health are integrated from their Electronic Medical Record system into Panorama, upload failures are possible. Other reasons for missing immunization records in Panorama include delays in data entry of immunization records provided to Public Health and immunizations administered in other provinces or countries. Of note, Nova Scotia's student population has been increasing⁴ in the years covered by this report and it is likely that some students were immunized outside of Nova Scotia. Their records may not be included in the numerator, yet they would be registered in the denominator, resulting in underestimation of coverage.

Denominator information relies on the data provided by the Department of Education and Early Childhood Development that is available in Panorama. This information is automatically uploaded for students within the public school system, but for students outside of the public school system (e.g. private schools, home-school, Mi'kmaw Kina'matnewey school board) education information must be entered manually into Panorama. There was incomplete education information in Panorama for the cohort presented here, resulting in this report being limited to public school students.

Health zone was assigned using the postal code of the school. In some areas of the province, school board boundaries and health zone borders do not align. In these cases, schools were classified based on the zone administering the vaccine. Moreover, students may not necessarily live in the zones where they attend school.

Overall Immunization Coverage

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

⁴ [After years of sinking enrolment, N.S. suddenly faces a new problem: Too many students | CBC News](#)

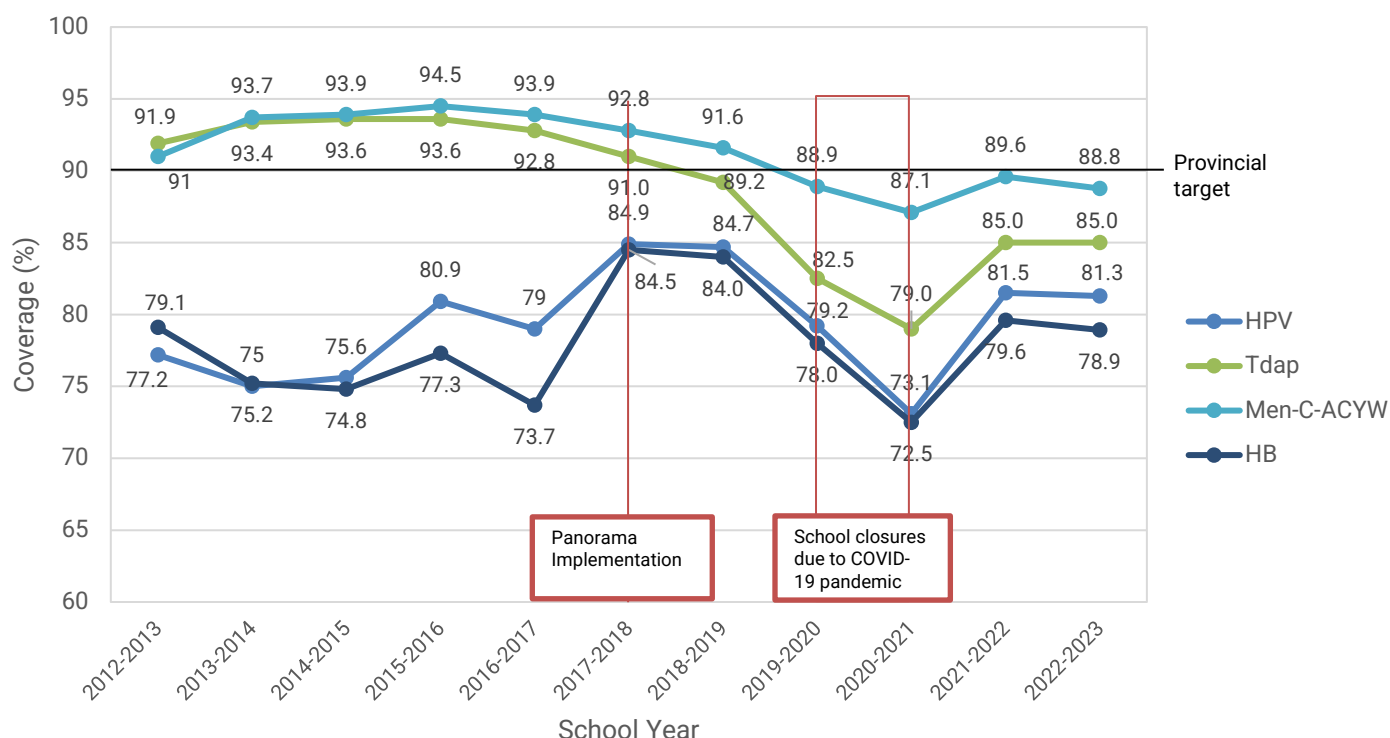
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Table 1: Full series coverage for school-based immunization program vaccines in Nova Scotia in the 2022-2023 school year

	Men-C-ACYW	Tdap	HPV	HB
Coverage (%)	88.8%	85.0%	81.3%	78.9%

Note: The coverage for all four of the school program vaccines were below the provincial target of 90% for the 2022-2023 grade 7 cohort.

Figure 1: Full series coverage for school program vaccines in Nova Scotia over 10 years (2012/13-2022/23)



Notes:

- The single dose series (Men-C-ACYW and Tdap) showed higher coverage over the 10-year period than the two-dose series (HPV and HB).
- Coverage for all school-based immunizations has remained relatively stable between the 2021-2022 and 2022-2023 school years but show a decreasing trend from pre-pandemic years, particularly among Men-C-ACYW and Tdap.
- In the 2017-18 school year, Nova Scotia implemented a new immunization reporting system, Panorama. With this implementation, methods for defining the numerator and denominator changed. Prior to 2017-18, the number of grade 7 students immunized was estimated using an age range (numerator) and aggregate student counts were used to estimate the total grade 7 population (denominator). This may have overestimated coverage prior to 2017-2018, particularly for single dose vaccines.
- From 2017-18 onwards, immunizations administered up to December 31 of the subsequent school year are included in the coverage, to allow for the capture of students who complete the school-based immunizations in the fall of grade 8. Prior to 2017-18, only immunizations administered up to August

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31 were included. This may explain the slight increase in the coverage for multi-dose vaccines in the 2017-18 and 2018-19 school years.

- The 2019-20 and 2020-21 cohorts experienced school closures during the spring term due to the COVID-19 pandemic, which impacted the timing of the delivery of the spring term vaccine doses (Tdap, HPV, hepatitis B). Given the delays to the immunization program, coverage by December 31 of the grade 8 year is lower for these cohorts. Ongoing efforts by local Public Health beyond December 31 of the grade 8 year has subsequently improved the coverage reported here.

Men-C-ACYW Immunization Coverage

There was a total of 9630 public school students in grade 7 in the 2022-2023 school year. The Men-C-ACYW immunization coverage in grade 7 students was 88.8%. Of those vaccinated, 0.6%, 98.7%, and 0.8% received the vaccine prior to grade 7, in grade 7, and in grade 8, respectively.

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

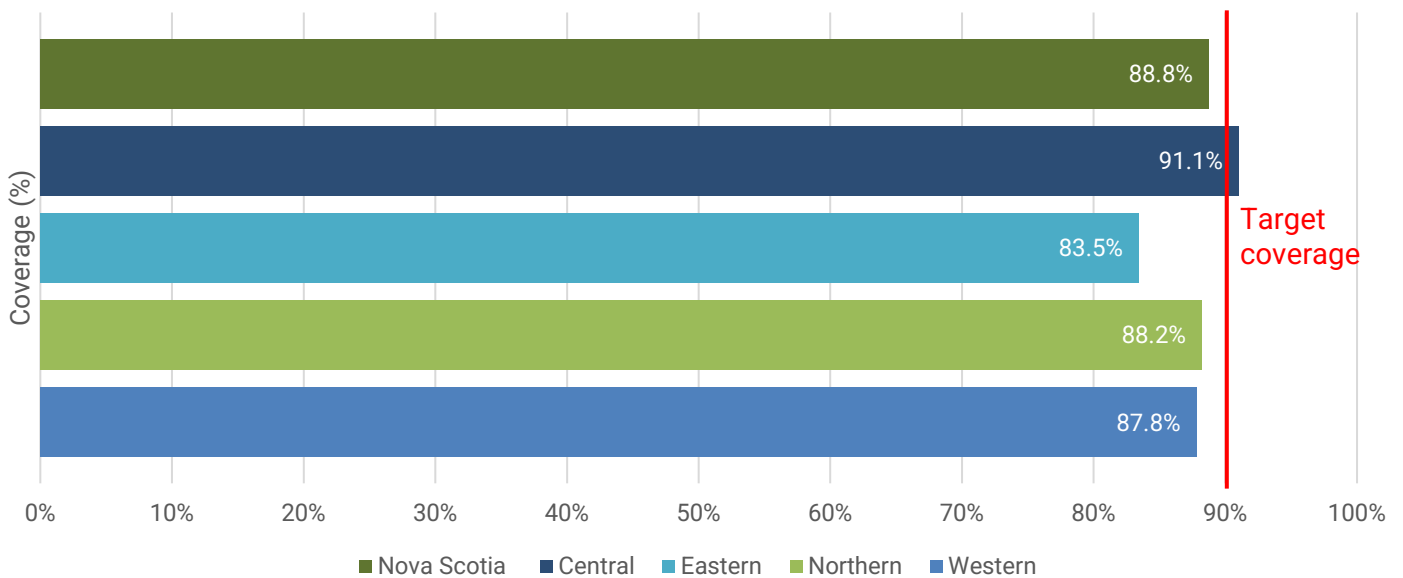
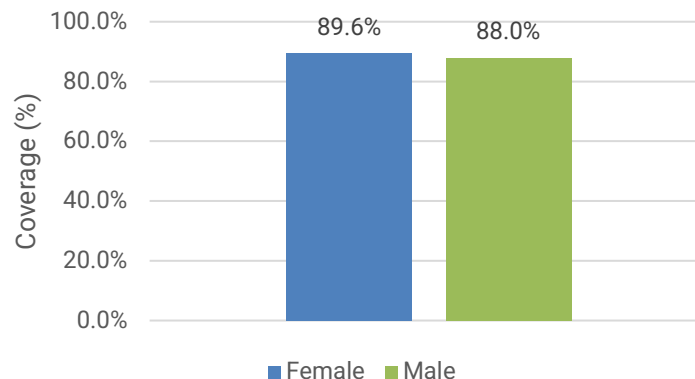


Figure 3: Men-C-ACYW immunization coverage by gender



Tdap Immunization Coverage

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Among the 9630 public school students in grade 7 in the 2022-2023 school year, the Tdap immunization coverage was 85.0%. Of those vaccinated, 1.6%, 94.8%, and 3.5% received the vaccine prior to grade 7, in grade 7, and in grade 8, respectively.

Figure 4: Tdap immunization coverage by health zone

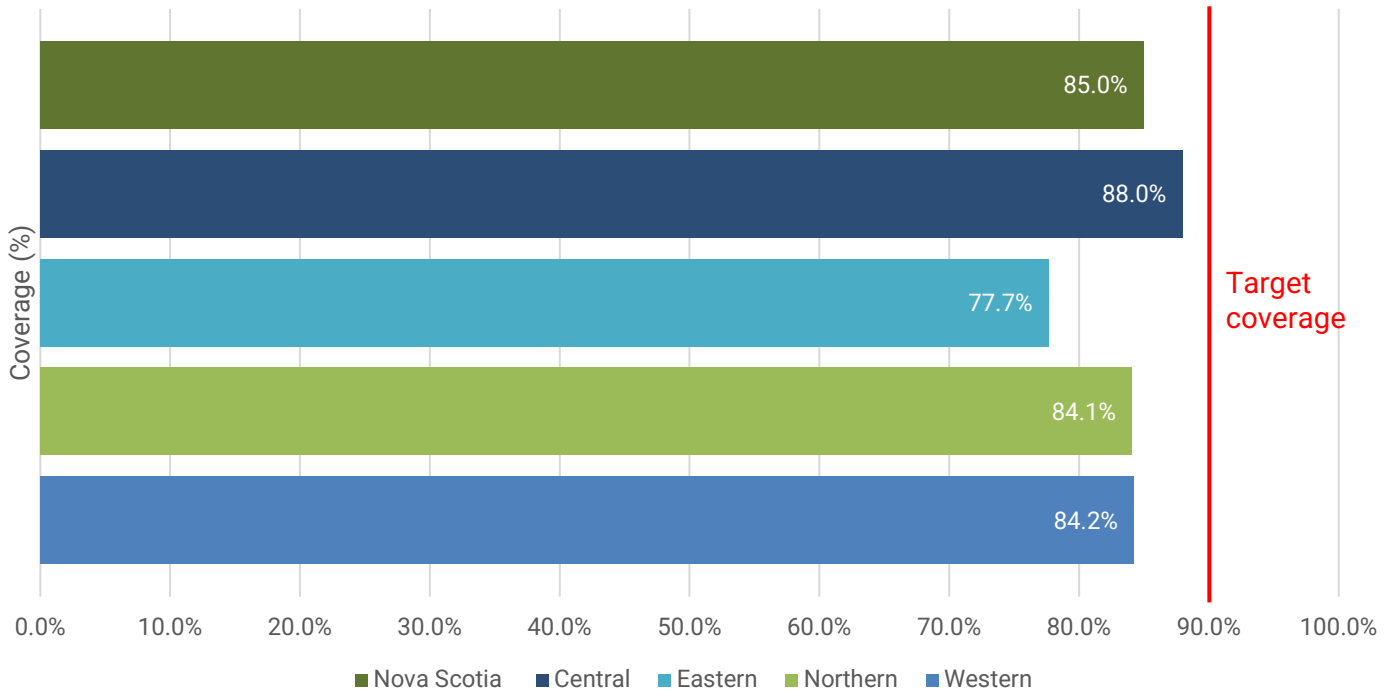
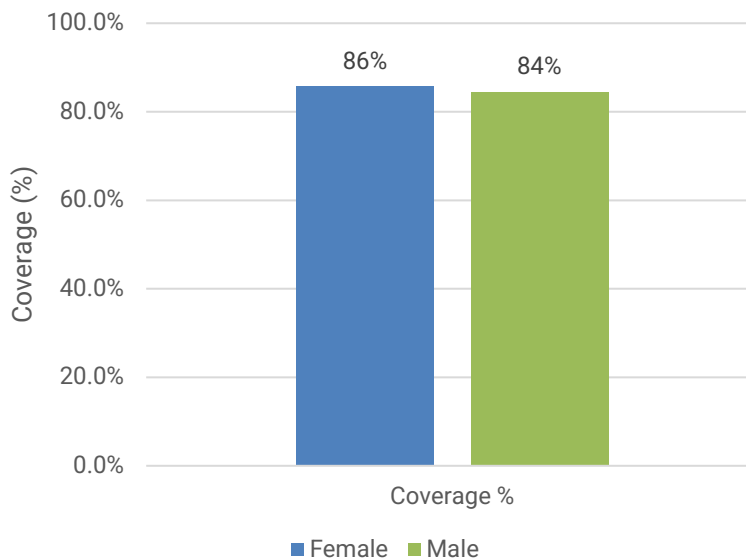


Figure 5: Tdap immunization coverage by gender



HPV Immunization Coverage

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Among the 9630 public school students in grade 7 in the 2022-2023 school year, the HPV full series immunization coverage was 81.3%. Of those vaccinated, 0.4%, 92.6%, and 7.0% completed the vaccine series prior to grade 7, in grade 7, and in grade 8, respectively.

Figure 6: HPV full series immunization coverage by health zone

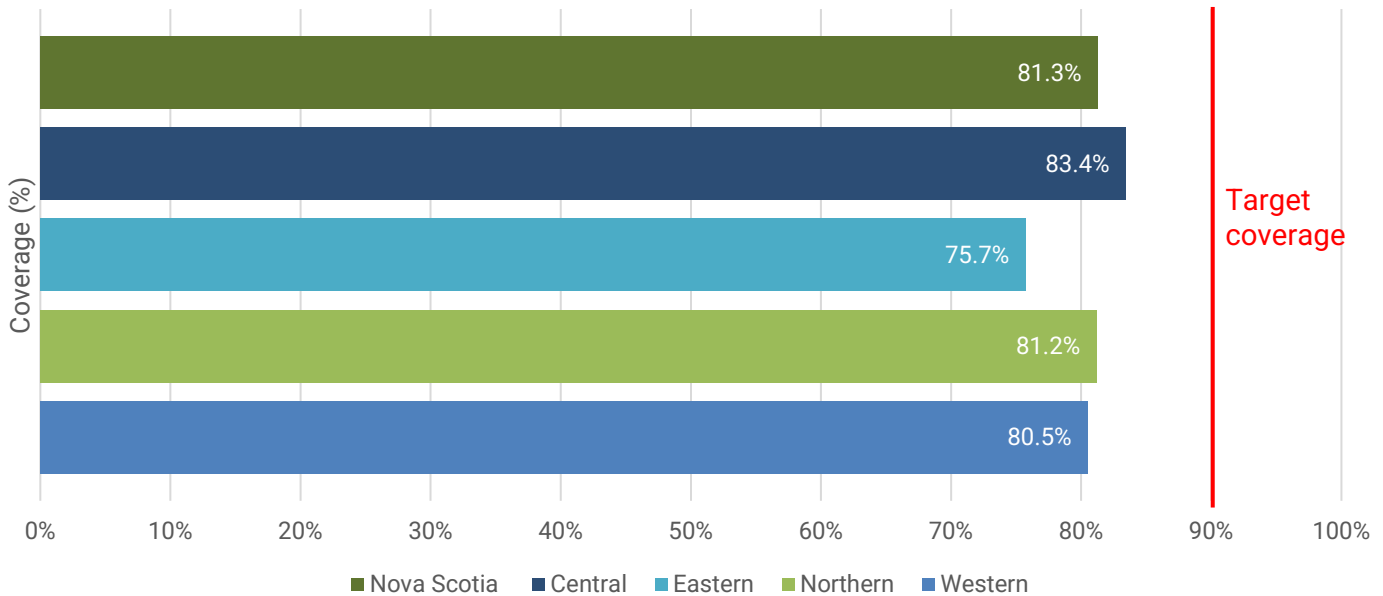
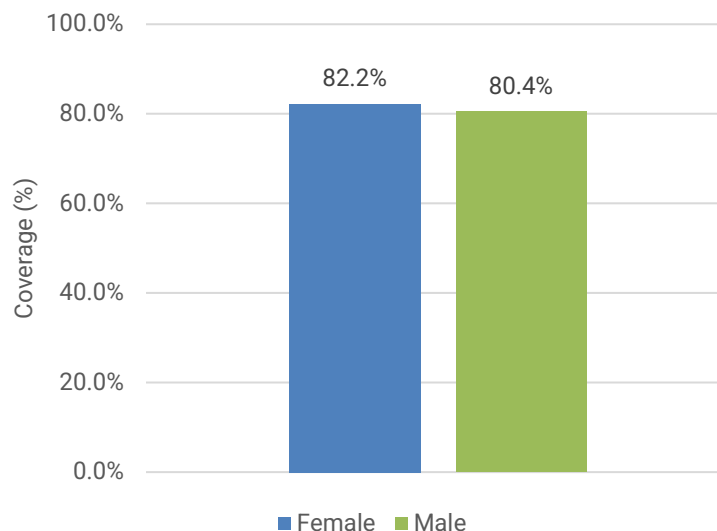


Figure 7: HPV full series immunization coverage by gender



Of the 9630 public school students in grade 7 in the 2022-2023 school year, 86.5% initiated the HPV vaccine series and 81.3% completed it. Of the 8329 students who initiated the series, 94.0% of them completed it.

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HB Immunization Coverage

Among the 9630 public school students in grade 7 in the 2022-2023 school year, the HB full series immunization coverage in was 78.9%. Of those vaccinated, 5.6%, 87.6%, and 6.9% completed the series prior to grade 7, in grade 7, and in grade 8, respectively.

Figure 8: HB full series immunization coverage by zone

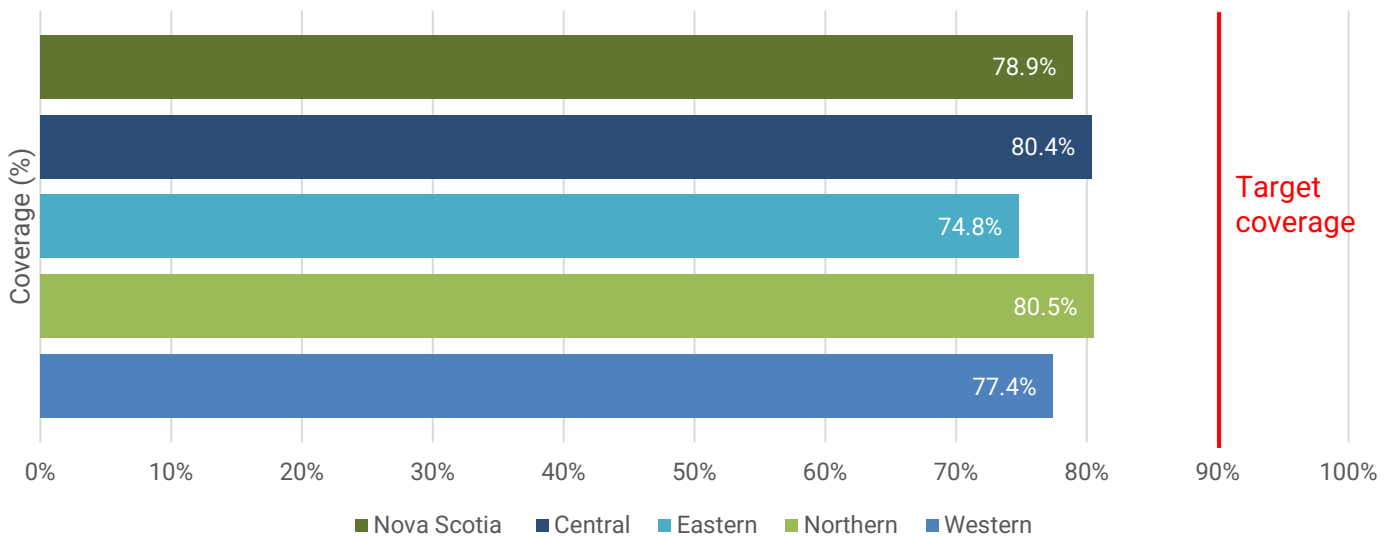
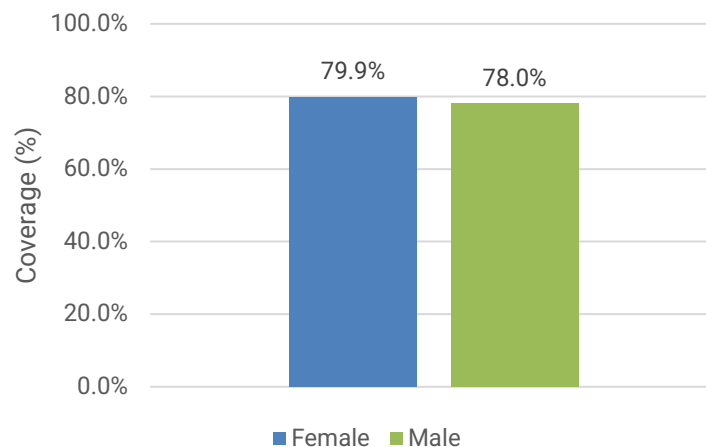


Figure 9: HB full series immunization coverage by gender



Of the 9630 public school students in grade 7 in the 2022-2023 school year, 86.1% initiated the HB vaccine series and 78.9% completed it. Of the 8288 students who initiated the series, 91.7% of them completed it.

Of the 7600 students who completed the HB vaccine series, 98.1% completed a series with a monovalent Hepatitis B vaccine and 1.9% completed it with a Hepatitis A and B combination vaccine.