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# Immunization Coverage in Grade 9 Students

## 2013-2023

March 2024

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## Abbreviations

### Health Authorities

IH	Interior Health	ISLH	Island Health
FH	Fraser Health	NH	Northern Health
VCH	Vancouver Coastal Health		

### Health Service Delivery Areas

EK	East Kootenay	VAN	Vancouver
KB	Kootenay Boundary	NSCG	North Shore / Coast Garibaldi
OK	Okanagan	SVI	South Vancouver Island
TCS	Thompson Cariboo Shuswap	CVI	Central Vancouver Island
FE	Fraser East	NVI	North Vancouver Island
FN	Fraser North	NW	Northwest
FS	Fraser South	NI	Northern Interior
RICH	Richmond	NE	Northeast

### Additional abbreviations

BC	British Columbia	MyEdBC	MyEducation BC
HPV	Human papillomavirus	PIR	Provincial Immunization Registry
MoE	Ministry of Education	Tdap	Tetanus, diphtheria, acellular pertussis
MenC- ACYW	Meningococcal conjugate quadrivalent		

For an explanation of BC Health Authorities, please visit [this website](#).

The BCCDC Immunization Coverage Dashboard is available online [here](#).

## Executive Summary

The 2013-2023 grade 9 report contains coverage information for students who were enrolled in grade 9 in British Columbia (BC) for four antigens: tetanus/diphtheria, pertussis, meningococcal quadrivalent, and human papillomavirus (HPV). In 2023, data reflects coverage as of the 2022/2023 school year. Meningococcal quadrivalent assessment is based on a single dose of MenC-ACYW administered in grade 9, whereas the tetanus/diphtheria and pertussis series are based on completion of a primary series in early childhood and a single booster dose (Tdap) primarily offered in grade 9. Any students who did not initiate or complete the HPV series in grade 6 are offered any missed doses in grade 9.

Overall, provincial coverage was relatively similar across all four antigens, but was highest for meningococcal quadrivalent (74.3%), followed by tetanus/diphtheria (74.1%), pertussis (73.9%), and HPV (72.1%). Coverage for tetanus/diphtheria and pertussis in 2023 increased compared to 2021 and 2022, and was higher than 2018 and 2019, but remained below the maximum of 74.9% in 2020. Meningococcal quadrivalent also increased compared to 2021 and 2022, but remained below pre-pandemic years (2018-2019) and 2020. Coverage for HPV has been increasing since 2018 in both females and males, with the exception of males in 2023, which had a 0.3% decline compared to 2022.

Reasons for non-immunization (i.e., documented refusals, exemptions, or contraindications) were also assessed among partially immunized and unimmunized students for all four antigens. Partially immunized students are defined as those who have received one or more vaccines in a series, but are not up-to-date (see [Notes](#) and Table A3 in the [Appendix](#) for further details). A notable trend is that many students were partially immunized or unimmunized with no documented refusals or contraindications (i.e., their reason for non-immunization was unknown). Improving documentation of immunization doses, refusals, and contraindications may provide better estimates of the proportion of grade 9 students in BC with protection against tetanus/diphtheria, pertussis, meningococcal quadrivalent, and HPV and indicate where to focus catch-up efforts.

### Limitations

All calculations are based on vaccine doses recorded in the provincial or regional immunization registry and enrolment records maintained by regional health authorities (HAs) using electronic enrolment records from the Ministry of Education (MoE), or records received directly from schools. Doses administered by providers other than public health, including doses administered outside of BC to newly arrived students whose records have not yet been received by public health, may not be reported in the registry. Students attending First Nations schools may be under-represented in this dataset because some First Nations schools are not registered with the BC MoE and are therefore not captured in the provincial list of schools. Data from 2018 onwards are not comparable to historical data due to data source changes. Categorization of reasons for non-immunization as refusal or contraindication is likely to be incomplete for Fraser Health (FH) due to lack of supplemental data transfer between the FH regional and the provincial immunization registry. There may be lag times in data entry.

Starting in 2023, international students were excluded from analysis and reported separately in the [Appendix](#) as there is a larger proportion of missing immunization records among these students. In general, coverage for all four antigens was lower among international students compared to the BC population, ranging from 30% for HPV to 52% for meningococcal quadrivalent.

**Please refer to the [Notes](#) for additional information.**

## Grade 9 students with up-to-date immunizations: Tetanus/Diphtheria

Provincial coverage for tetanus/diphtheria among grade 9 students slightly increased from 71.6% in 2022 to 74.1% in 2023 (**Table 1**). Increases occurred in all HAs apart from Vancouver Coastal Health (VCH), which declined by 0.4% from last year (**Table 1** and **Figure 1**). At the HA level, coverage was highest in VCH (82.1%) and lowest in Northern Health (NH; 62.3%). Rates and trends varied by HSDA, with 2023 tetanus/diphtheria coverage rates ranging from 55.6% in Northeast to 92.1% in Richmond.

In the 2022/2023 school year, only 3% and 1% of BC grade 9 students were partially immunized and unimmunized with a documented refusal for tetanus/diphtheria, respectively, while 18% and 3% were partially immunized and unimmunized for unknown reasons (**Table 2**). Since tetanus/diphtheria is part of early childhood immunization programs, the “partially immunized” categories will reflect those who have received any valid dose of these antigens but have not had a complete series per the BC immunization schedule (see Table A3 and Table A4 in the [Appendix](#)).

**Table 1. Percent of Grade 9 students with up-to-date immunizations: Tetanus/Diphtheria**

HEALTH AUTHORITY / HEALTH SERVICE DELIVERY AREA	YEAR										
	2013	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*	2022*	2023*^
<b>INTERIOR *</b>	<b>83.4%</b>	<b>82.2%</b>	<b>81.0%</b>	<b>83.0%</b>	<b>82.4%</b>	<b>75.5%</b>	<b>78.0%</b>	<b>76.9%</b>	<b>41.0%</b>	<b>67.7%</b>	<b>70.9%</b>
East Kootenay	87.7%	82.8%	85.0%	89.1%	87.7%	78.4%	80.5%	83.2%	77.4%	73.0%	67.0%
Kootenay Boundary	82.0%	77.9%	74.3%	79.2%	75.4%	69.2%	73.5%	64.9%	64.9%	61.7%	64.7%
Okanagan	78.8%	78.8%	78.0%	78.5%	81.2%	73.5%	76.9%	75.1%	36.6%	69.8%	72.4%
Thompson Cariboo Shuswap	89.4%	88.2%	86.9%	89.6%	84.7%	79.9%	80.3%	81.7%	26.6%	64.4%	72.1%
<b>FRASER *</b>	<b>84.6%</b>	<b>84.3%</b>	<b>79.0%</b>	<b>82.1%</b>	<b>80.8%</b>	<b>60.7%</b>	<b>63.9%</b>	<b>70.4%</b>	<b>4.8%</b>	<b>69.7%</b>	<b>73.2%</b>
Fraser East	83.7%	84.4%	75.9%	79.4%	78.7%	66.8%	68.4%	68.1%	6.0%	62.3%	63.0%
Fraser North	81.1%	83.4%	75.0%	79.9%	78.4%	57.8%	58.4%	68.8%	3.9%	71.6%	75.1%
Fraser South	87.5%	85.0%	83.0%	84.7%	83.2%	60.6%	66.1%	72.3%	5.0%	71.0%	75.8%
<b>VANCOUVER COASTAL</b>	<b>82.4%</b>	<b>84.5%</b>	<b>83.9%</b>	<b>83.4%</b>	<b>84.2%</b>	<b>84.2%</b>	<b>85.3%</b>	<b>83.6%</b>	<b>37.1%</b>	<b>82.5%</b>	<b>82.1%</b>
Richmond	93.3%	94.8%	93.4%	90.1%	89.8%	91.5%	92.9%	92.5%	57.2%	92.8%	92.1%
Vancouver	85.5%	86.5%	85.5%	84.5%	84.6%	84.4%	85.3%	82.1%	20.9%	81.6%	81.4%
North Shore / Coast Garibaldi	69.8%	75.1%	75.6%	77.5%	80.4%	79.9%	81.1%	81.4%	52.6%	77.8%	78.1%
<b>ISLAND *</b>	<b>80.6%</b>	<b>73.4%</b>	<b>73.6%</b>	<b>75.8%</b>	<b>71.8%</b>	<b>70.1%</b>	<b>73.0%</b>	<b>74.3%</b>	<b>70.9%</b>	<b>72.0%</b>	<b>74.8%</b>
South Vancouver Island	81.7%	71.1%	72.6%	78.7%	72.7%	69.0%	72.3%	74.3%	73.6%	74.6%	79.1%
Central Vancouver Island	80.2%	75.8%	74.9%	73.0%	69.5%	70.4%	73.6%	74.6%	69.3%	72.6%	73.4%
North Vancouver Island	78.3%	74.3%	73.6%	74.0%	74.2%	72.7%	74.2%	73.4%	66.8%	64.4%	67.1%
<b>NORTHERN *</b>	<b>87.8%</b>	<b>85.6%</b>	<b>83.6%</b>	<b>87.5%</b>	<b>86.3%</b>	<b>84.7%</b>	<b>83.5%</b>	<b>70.9%</b>	<b>59.7%</b>	<b>59.4%</b>	<b>62.3%</b>
Northwest	86.6%	86.5%	91.5%	91.0%	87.0%	85.6%	81.1%	70.0%	71.6%	64.3%	69.2%
Northern Interior	92.0%	86.6%	83.9%	87.8%	88.7%	87.5%	84.1%	72.6%	68.1%	62.6%	62.4%
Northeast	79.8%	82.2%	74.3%	83.2%	80.7%	78.3%	84.4%	68.7%	31.4%	49.7%	55.6%
<b>BRITISH COLUMBIA *</b>	<b>83.6%</b>	<b>82.3%</b>	<b>79.9%</b>	<b>81.9%</b>	<b>80.8%</b>	<b>70.8%</b>	<b>73.1%</b>	<b>74.9%</b>	<b>31.5%</b>	<b>71.6%</b>	<b>74.1%</b>

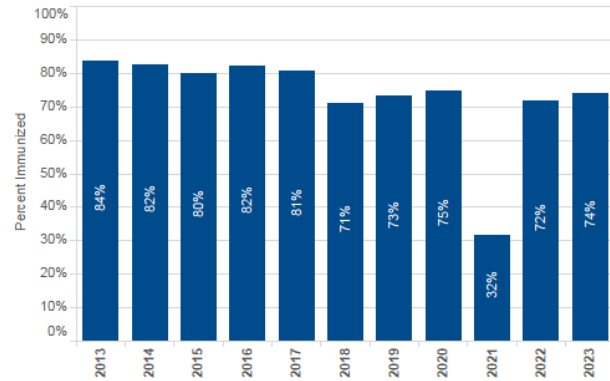
**Notes:**

^Excluding international students.

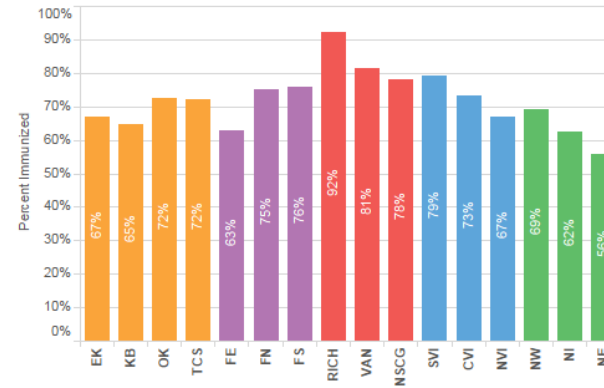
\* From 2014 onwards estimates for BC and some of the health authorities are not directly comparable to previous years. See [Notes](#).

**Grade 9 Students Immunized  
Tetanus/Diphtheria Vaccine, British Columbia**

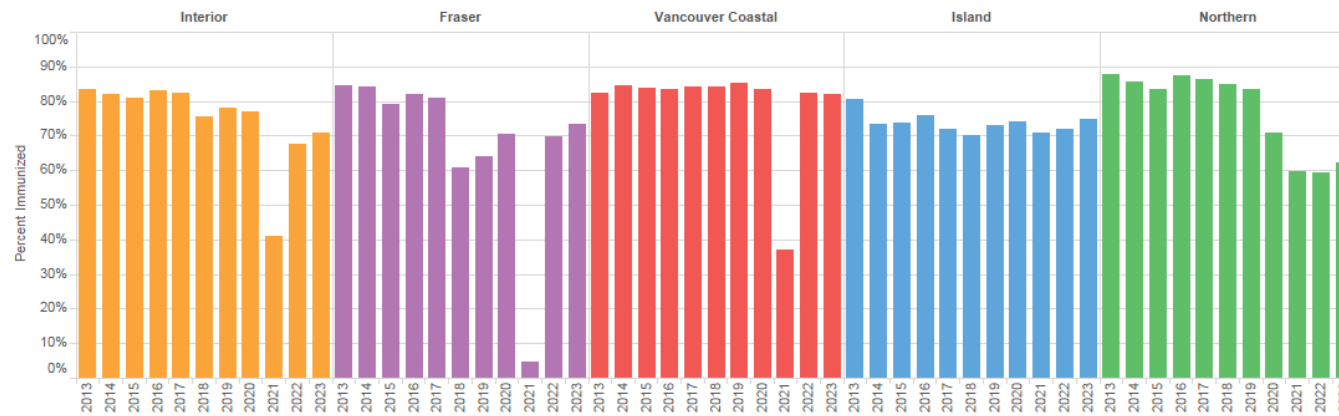
**All British Columbia, by Year**



**By Health Service Delivery Area, 2023**



**By Health Authority and Year**



**Figure 1. Percent of Grade 9 students with up-to-date immunizations: Tetanus/Diphtheria**

Table 2. Reasons for non-immunization for Grade 9 students: Tetanus/Diphtheria, 2023\*

Region	Population	Count				Percent			
		Partially Immunized		Unimmunized		Partially Immunized		Unimmunized	
		Refusal	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>
<b>British Columbia</b>	<b>49,450</b>	<b>1,529</b>	<b>8,958</b>	<b>713</b>	<b>1,607</b>	<b>3%</b>	<b>18%</b>	<b>1%</b>	<b>3%</b>
<b>Interior</b>	<b>8,224</b>	570	1,313	268	241	7%	16%	3%	3%
East Kootenay	949	61	192	27	33	6%	20%	3%	4%
Kootenay Boundary	799	95	116	49	22	12%	14%	6%	3%
Okanagan	3,967	265	587	126	118	7%	15%	3%	3%
Thompson Cariboo Shuswap	2,509	149	418	66	68	6%	17%	3%	3%
<b>Fraser<sup>b</sup></b>	<b>19,890</b>	<b>170</b>	<b>4,255</b>	<b>146</b>	<b>758</b>	<b>1%</b>	<b>21%</b>	<b>1%</b>	<b>4%</b>
Fraser East	3,642	62	1,074	76	137	2%	30%	2%	4%
Fraser North	6,582	35	1,290	27	287	0%	20%	0%	4%
Fraser South	9,666	73	1,891	43	334	1%	20%	0%	4%
<b>Vancouver Coastal</b>	<b>10,004</b>	<b>276</b>	<b>1,068</b>	<b>104</b>	<b>339</b>	<b>3%</b>	<b>11%</b>	<b>1%</b>	<b>3%</b>
Richmond	1,693	12	103	7	11	1%	6%	0%	1%
Vancouver	5,046	140	568	35	195	3%	11%	1%	4%
North Shore / Coast Garibaldi	3,265	124	397	62	133	4%	12%	2%	4%
<b>Island</b>	<b>7,758</b>	<b>362</b>	<b>1,284</b>	<b>142</b>	<b>164</b>	<b>5%</b>	<b>17%</b>	<b>2%</b>	<b>2%</b>
South Vancouver Island	3,619	116	496	59	87	3%	14%	2%	2%
Central Vancouver Island	2,669	159	458	55	38	6%	17%	2%	1%
North Vancouver Island	1,470	87	330	28	39	6%	22%	2%	3%
<b>Northern</b>	<b>3,574</b>	<b>151</b>	<b>1,038</b>	<b>53</b>	<b>105</b>	<b>4%</b>	<b>29%</b>	<b>1%</b>	<b>3%</b>
Northwest	877	34	193	13	30	4%	22%	2%	3%
Northern Interior	1,766	68	529	28	39	4%	30%	2%	2%
Northeast	931	49	316	12	36	5%	34%	1%	4%

**Notes:** a. "Unknown" includes all children who are partially immunized or unimmunized who do not have a documented refusal or contraindication, based on information in the immunization registry. This includes children who have deferred or inadvertently missed their immunizations, and those who have not had their refusal, contraindication, or immunization doses recorded.

b. PIR does not contain complete supplementary information on reasons for non-immunization (i.e., exemptions, refusals and contraindications) for FH. Therefore, the proportion of partially immunized and unimmunized students with unknown reasons for non-immunization is likely to be overestimated, [see Note #12](#).

\*Excluding international students.



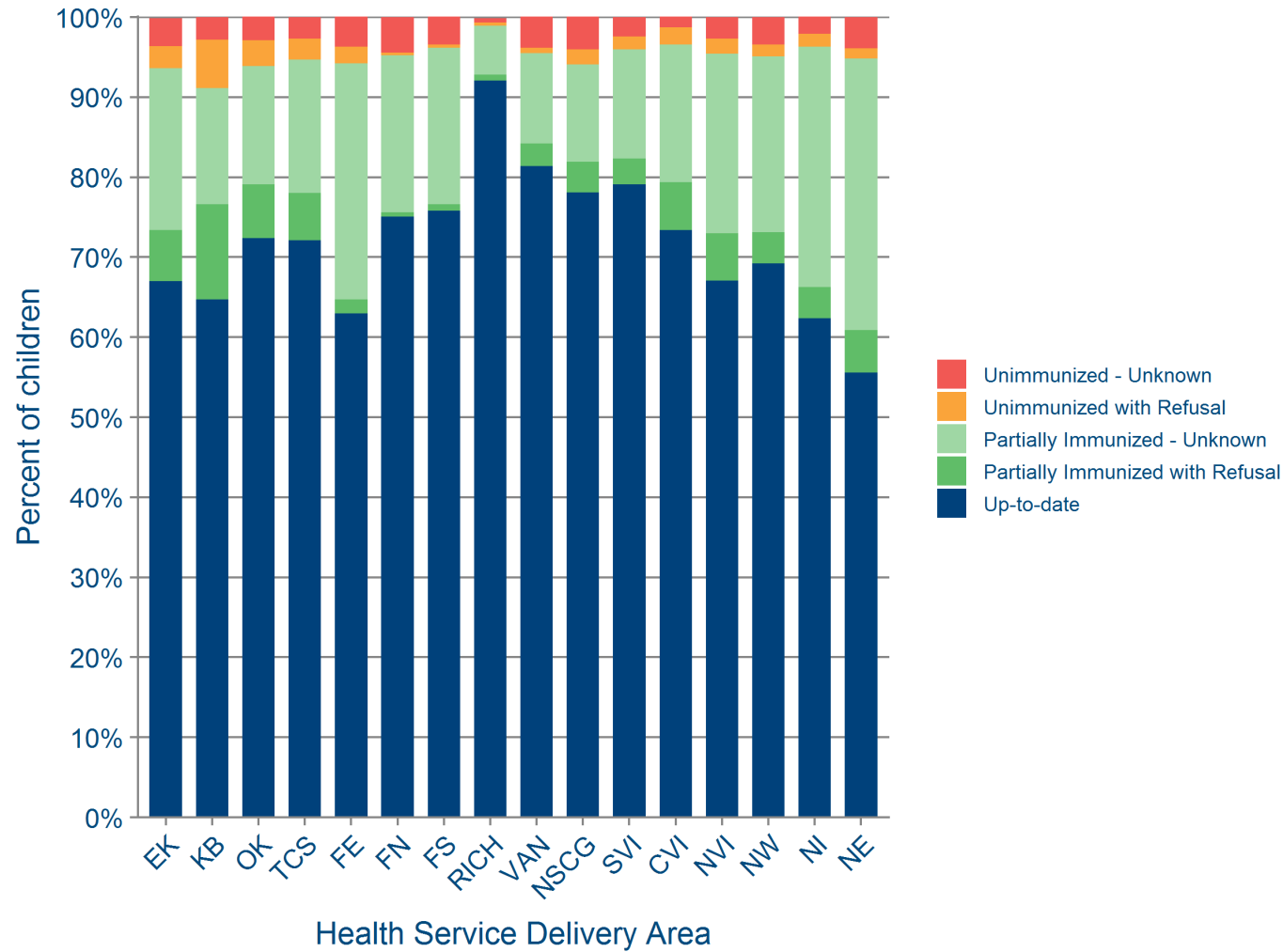


Figure 2. Reasons for non-immunization for Grade 9 students: Tetanus/Diphtheria, 2023

## Grade 9 students with up-to-date immunizations: Pertussis

Similar to the pattern in grade 9 tetanus/diphtheria coverage, a slight provincial increase was observed for pertussis coverage in the 2022/2023 school year from 71.4% to 73.9% (**Table 3**). All HAs had a slight increase in coverage, except for VCH, which had a slight decrease of 0.3% (**Table 3** and **Figure 3**). At the HA level, coverage was highest in VCH (81.9%) and lowest in NH (61.9%). Rates and trends varied by HSDA, with 2023 pertussis coverage rates ranging from 55.6% in Northeast to 92.0% in Richmond.

In the 2022/2023 school year, only 3% and 1% of BC grade 9 students were partially immunized and unimmunized with a documented refusal for pertussis, respectively, while 18% and 3% were partially immunized and unimmunized for unknown reasons (**Table 4**). Since pertussis is part of early childhood immunization programs, the “partially immunized” categories will reflect those who have received any valid dose of this antigen but have not had a complete series per the BC immunization schedule (see Table A3 and Table A4 in the [Appendix](#)).

**Table 3. Percent of Grade 9 students with up-to-date immunizations: Pertussis**

HEALTH AUTHORITY / HEALTH SERVICE DELIVERY AREA	YEAR										
	2013	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*	2022*	2023*^
<b>INTERIOR *</b>	<b>81.4%</b>	<b>80.5%</b>	<b>80.3%</b>	<b>79.8%</b>	<b>80.5%</b>	<b>75.3%</b>	<b>77.7%</b>	<b>76.7%</b>	<b>40.8%</b>	<b>67.4%</b>	<b>70.7%</b>
East Kootenay	84.3%	81.5%	84.6%	85.0%	85.9%	78.2%	80.3%	82.9%	77.1%	72.7%	66.9%
Kootenay Boundary	79.6%	73.7%	72.2%	73.8%	72.1%	69.0%	72.3%	64.0%	64.4%	61.5%	64.1%
Okanagan	77.1%	77.8%	77.7%	76.1%	79.4%	73.4%	76.7%	74.9%	36.5%	69.6%	72.2%
Thompson Cariboo Shuswap	87.6%	86.4%	86.1%	86.2%	83.2%	79.7%	80.2%	81.5%	26.6%	64.2%	71.9%
<b>FRASER *</b>	<b>81.6%</b>	<b>79.1%</b>	<b>78.4%</b>	<b>80.1%</b>	<b>79.4%</b>	<b>60.6%</b>	<b>63.8%</b>	<b>70.2%</b>	<b>4.6%</b>	<b>69.6%</b>	<b>73.0%</b>
Fraser East	74.0%	73.8%	73.2%	73.8%	75.2%	66.8%	68.4%	68.0%	6.0%	62.2%	62.9%
Fraser North	80.2%	77.5%	74.8%	78.6%	77.6%	57.7%	58.3%	68.7%	3.7%	71.4%	74.9%
Fraser South	85.5%	82.1%	82.8%	83.5%	82.2%	60.4%	66.0%	72.1%	4.8%	70.9%	75.6%
<b>VANCOUVER COASTAL</b>	<b>81.8%</b>	<b>84.0%</b>	<b>83.3%</b>	<b>82.9%</b>	<b>83.9%</b>	<b>83.9%</b>	<b>85.0%</b>	<b>83.3%</b>	<b>36.8%</b>	<b>82.2%</b>	<b>81.9%</b>
Richmond	93.0%	94.7%	93.2%	90.0%	89.5%	91.1%	92.6%	92.4%	57.1%	92.6%	92.0%
Vancouver	85.1%	86.2%	85.1%	84.1%	84.3%	84.1%	85.0%	81.8%	20.7%	81.4%	81.1%
North Shore / Coast Garibaldi	68.8%	74.1%	74.5%	76.7%	79.9%	79.5%	80.6%	81.0%	52.2%	77.3%	77.8%
<b>ISLAND *</b>	<b>79.2%</b>	<b>72.9%</b>	<b>73.1%</b>	<b>75.4%</b>	<b>71.5%</b>	<b>69.9%</b>	<b>72.7%</b>	<b>73.9%</b>	<b>70.6%</b>	<b>71.7%</b>	<b>74.6%</b>
South Vancouver Island	79.3%	71.0%	72.3%	78.4%	72.4%	68.8%	71.9%	73.9%	73.3%	74.3%	78.8%
Central Vancouver Island	80.0%	75.2%	74.2%	72.5%	69.2%	70.2%	73.1%	74.2%	69.1%	72.2%	73.2%
North Vancouver Island	77.1%	73.0%	73.1%	73.0%	73.9%	72.6%	73.9%	73.1%	66.7%	64.2%	66.7%
<b>NORTHERN *</b>	<b>86.4%</b>	<b>84.7%</b>	<b>82.5%</b>	<b>82.3%</b>	<b>83.6%</b>	<b>82.5%</b>	<b>83.1%</b>	<b>70.6%</b>	<b>59.3%</b>	<b>58.9%</b>	<b>61.9%</b>
Northwest	85.8%	84.3%	89.1%	81.6%	82.0%	83.7%	80.5%	69.7%	71.2%	62.8%	68.1%
Northern Interior	89.8%	86.1%	83.2%	85.3%	86.0%	84.6%	83.9%	72.4%	67.6%	62.4%	62.2%
Northeast	79.8%	81.9%	74.1%	77.1%	80.4%	76.9%	84.2%	68.5%	31.3%	49.2%	55.6%
<b>BRITISH COLUMBIA *</b>	<b>81.6%</b>	<b>79.8%</b>	<b>79.3%</b>	<b>80.1%</b>	<b>79.6%</b>	<b>70.5%</b>	<b>72.9%</b>	<b>74.9%</b>	<b>31.3%</b>	<b>71.4%</b>	<b>73.9%</b>

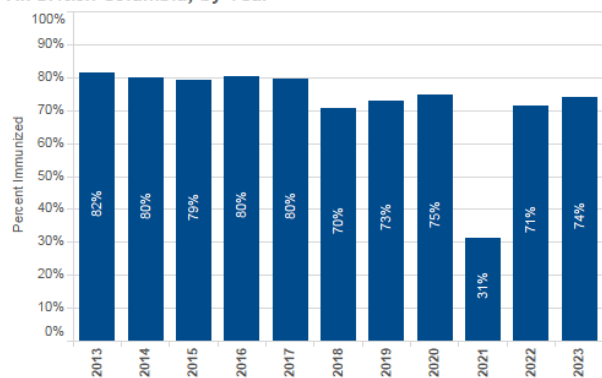
**Notes:**

^Excluding international students.

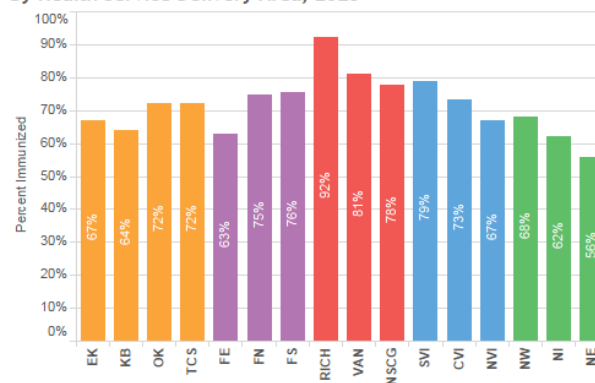
\* From 2014 onwards estimates for BC and some of the health authorities are not directly comparable to previous years. See [Notes](#).

### Grade 9 Students Immunized Pertussis Vaccine, British Columbia

All British Columbia, by Year



By Health Service Delivery Area, 2023



By Health Authority and Year

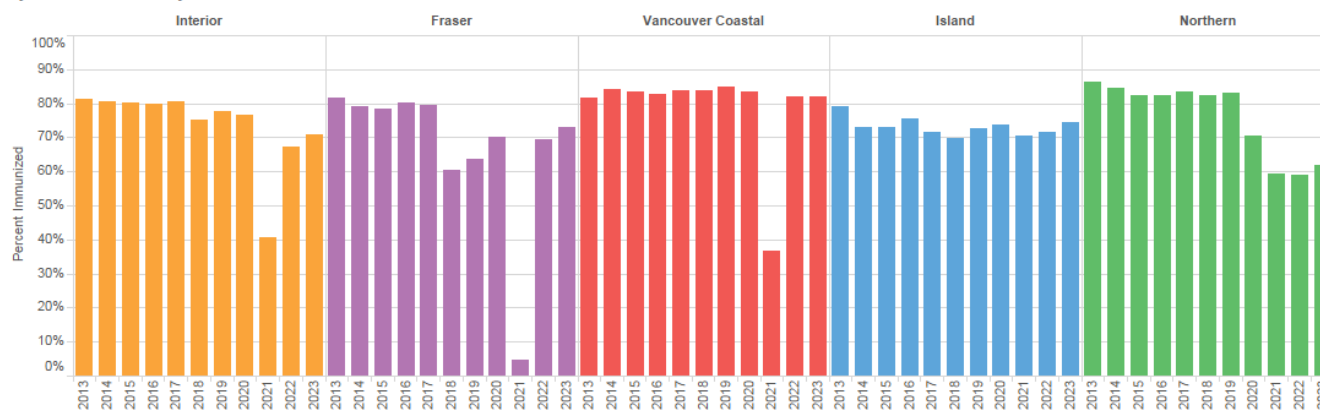


Figure 3. Percent of Grade 9 students with up-to-date immunizations: Pertussis

Table 4. Reasons for non-immunization for Grade 9 students: Pertussis, 2023\*

Region	Population	Count				Percent			
		Partially Immunized		Unimmunized		Partially Immunized		Unimmunized	
		Refusal	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>
<b>British Columbia</b>	<b>49,450</b>	<b>1,533</b>	<b>9,030</b>	<b>725</b>	<b>1,627</b>	<b>3%</b>	<b>18%</b>	<b>1%</b>	<b>3%</b>
<b>Interior</b>	<b>8,224</b>	<b>566</b>	<b>1,316</b>	<b>279</b>	<b>245</b>	<b>7%</b>	<b>16%</b>	<b>3%</b>	<b>3%</b>
East Kootenay	949	61	190	28	35	6%	20%	3%	4%
Kootenay Boundary	799	94	119	51	23	12%	15%	6%	3%
Okanagan	3,967	263	588	131	119	7%	15%	3%	3%
Thompson Cariboo Shuswap	2,509	148	419	69	68	6%	17%	3%	3%
<b>Fraser<sup>b</sup></b>	<b>19,890</b>	<b>171</b>	<b>4,278</b>	<b>147</b>	<b>767</b>	<b>1%</b>	<b>22%</b>	<b>1%</b>	<b>4%</b>
Fraser East	3,642	61	1,074	77	139	2%	30%	2%	4%
Fraser North	6,582	36	1,300	27	289	0%	20%	0%	4%
Fraser South	9,666	74	1,904	43	339	1%	20%	0%	4%
<b>Vancouver Coastal</b>	<b>10,004</b>	<b>282</b>	<b>1,086</b>	<b>105</b>	<b>341</b>	<b>3%</b>	<b>11%</b>	<b>1%</b>	<b>3%</b>
Richmond	1,693	12	105	7	11	1%	6%	0%	1%
Vancouver	5,046	144	578	35	196	3%	12%	1%	4%
North Shore / Coast Garibaldi	3,265	126	403	63	134	4%	12%	2%	4%
<b>Island</b>	<b>7,758</b>	<b>364</b>	<b>1,299</b>	<b>143</b>	<b>166</b>	<b>5%</b>	<b>17%</b>	<b>2%</b>	<b>2%</b>
South Vancouver Island	3,619	119	504	59	87	3%	14%	2%	2%
Central Vancouver Island	2,669	158	462	56	38	6%	17%	2%	1%
North Vancouver Island	1,470	87	333	28	41	6%	23%	2%	3%
<b>Northern</b>	<b>3,574</b>	<b>150</b>	<b>1,051</b>	<b>51</b>	<b>108</b>	<b>4%</b>	<b>29%</b>	<b>1%</b>	<b>3%</b>
Northwest	877	35	201	12	32	4%	23%	1%	4%
Northern Interior	1,766	68	532	28	39	4%	30%	2%	2%
Northeast	931	47	318	11	37	5%	34%	1%	4%

**Notes:** a. "Unknown" includes all children who are partially immunized or unimmunized who do not have a documented refusal or contraindication, based on information in the immunization registry. This includes children who have deferred or inadvertently missed their immunizations, and those who have not had their refusal, contraindication, or immunization doses recorded.

b. PIR does not contain complete supplementary information on reasons for non-immunization (i.e., exemptions, refusals and contraindications) for FH. Therefore, the proportion of partially immunized and unimmunized students with unknown reasons for non-immunization is likely to be overestimated, see [Note #12](#).

\*Excluding international students.

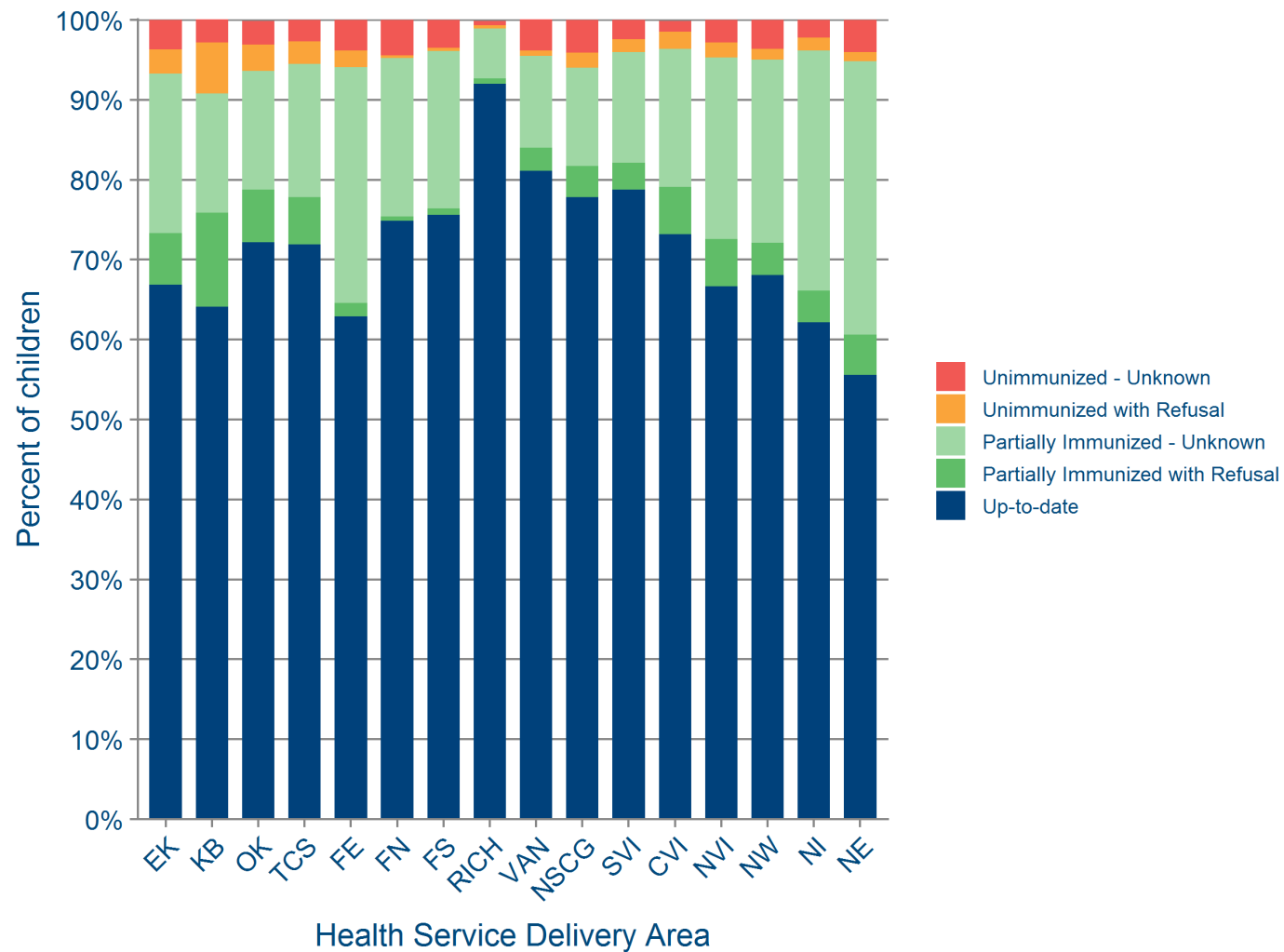


Figure 4. Reasons for non-immunization for Grade 9 students: Pertussis, 2023

## Grade 9 students with up-to-date immunizations: Meningococcal Quadrivalent Conjugate vaccine

The grade 9 meningococcal quadrivalent conjugate program began in September 2016, with coverage assessed for the first time in 2017 for the 2016/2017 school year. For more information on the history of the meningococcal quadrivalent conjugate program see [History of Immunization in BC](#).

The provincial meningococcal quadrivalent conjugate coverage slightly increased from 73.2% in 2021/2022 to 74.3% in 2022/2023 (**Table 5**). There were modest increases in FH (1.0%), Island Health (ISLH; 1.6%), IH (2.1%), and NH (3.6%), and a slight decrease in VCH (-0.5%) (**Table 5** and **Figure 5**). At the HA level, coverage was highest in VCH (82.3%) and lowest in NH (62.2%). Rates and trends varied by HSDA, coverage rates ranging from 54.2% in Northeast to 92.0% in Richmond.

Provincially, only 3% of grade 9 students in the 2022/2023 school year were unimmunized with a documented refusal for meningococcal quadrivalent vaccine (**Table 6** and **Figure 6**). Notably, 23% of grade 9 students were unimmunized with an unknown reason.

Table 5. Percent of Grade 9 students with up-to-date immunizations: Meningococcal Quadrivalent Conjugate vaccine

HEALTH AUTHORITY / HEALTH SERVICE DELIVERY AREA	YEAR						
	2017	2018*	2019*	2020*	2021*	2022*	2023*^
<b>INTERIOR *</b>	<b>80.0%</b>	<b>81.4%</b>	<b>80.2%</b>	<b>77.6%</b>	<b>38.9%</b>	<b>66.6%</b>	<b>68.7%</b>
East Kootenay	86.0%	78.9%	81.2%	82.4%	76.8%	70.0%	66.0%
Kootenay Boundary	70.4%	69.8%	74.5%	63.9%	63.4%	57.3%	60.3%
Okanagan	79.0%	84.7%	80.1%	76.9%	34.7%	70.1%	70.5%
Thompson Cariboo Shuswap	82.7%	81.0%	81.9%	81.7%	23.8%	63.1%	69.6%
<b>FRASER *</b>	<b>76.2%</b>	<b>74.2%</b>	<b>76.2%</b>	<b>77.0%</b>	<b>1.5%</b>	<b>74.7%</b>	<b>75.7%</b>
Fraser East	74.0%	72.3%	73.7%	70.6%	2.3%	62.8%	62.0%
Fraser North	77.8%	75.2%	72.1%	75.9%	1.1%	77.7%	77.8%
Fraser South	75.9%	74.2%	80.1%	80.3%	1.6%	76.9%	79.5%
<b>VANCOUVER COASTAL</b>	<b>87.8%</b>	<b>86.8%</b>	<b>87.6%</b>	<b>83.6%</b>	<b>29.0%</b>	<b>82.8%</b>	<b>82.3%</b>
Richmond	91.3%	92.4%	93.9%	92.2%	51.7%	93.8%	92.0%
Vancouver	87.9%	87.4%	88.2%	82.6%	10.2%	81.3%	81.5%
North Shore / Coast Garibaldi	85.3%	82.5%	83.2%	80.8%	47.4%	79.0%	78.4%
<b>ISLAND *</b>	<b>73.7%</b>	<b>71.3%</b>	<b>74.5%</b>	<b>74.8%</b>	<b>68.9%</b>	<b>70.1%</b>	<b>71.7%</b>
South Vancouver Island	75.5%	70.4%	73.7%	75.4%	73.3%	73.5%	76.4%
Central Vancouver Island	71.5%	71.8%	75.5%	76.1%	65.5%	70.4%	70.3%
North Vancouver Island	73.7%	72.9%	74.9%	70.6%	64.1%	60.9%	62.8%
<b>NORTHERN</b>	<b>83.9%</b>	<b>80.4%</b>	<b>82.2%</b>	<b>70.9%</b>	<b>59.3%</b>	<b>58.6%</b>	<b>62.2%</b>
Northwest	86.4%	79.9%	79.2%	69.8%	71.5%	64.5%	70.7%
Northern Interior	84.9%	83.8%	83.7%	72.5%	68.3%	62.1%	62.1%
Northeast	79.2%	74.2%	81.9%	69.2%	29.8%	47.4%	54.2%
<b>BRITISH COLUMBIA *</b>	<b>79.4%</b>	<b>77.8%</b>	<b>79.3%</b>	<b>77.8%</b>	<b>27.8%</b>	<b>73.2%</b>	<b>74.3%</b>

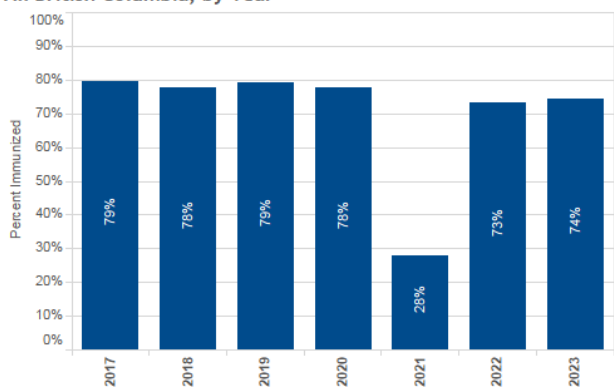
Notes: ^Excluding international students.

\* From 2018 onwards estimates for BC and some of the health authorities are not directly comparable to previous years. See [Notes](#).

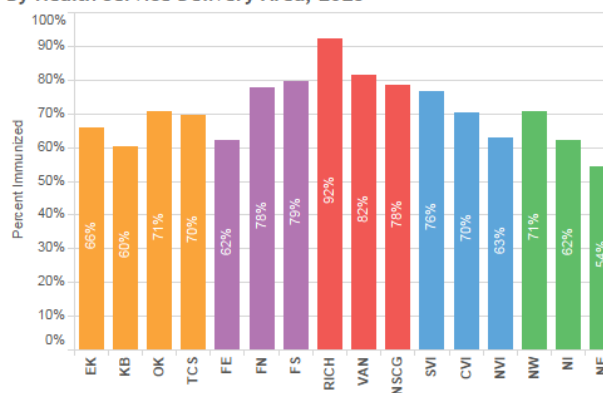


### Grade 9 Students Immunized Meningococcal Quadrivalent Conjugate Vaccine, British Columbia

All British Columbia, by Year



By Health Service Delivery Area, 2023



By Health Authority and Year

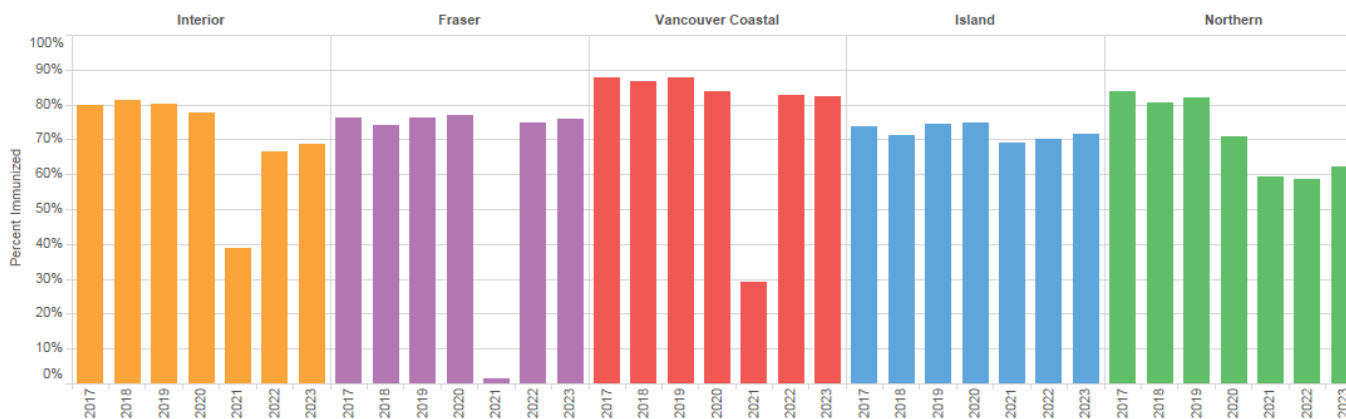


Figure 5. Percent of Grade 9 students with up-to-date immunizations: Meningococcal Quadrivalent Conjugate vaccine

**Table 6. Reasons for non-immunization for Grade 9 students: Meningococcal Quadrivalent Conjugate vaccine, 2023\***

Region	Population	Count		Percent	
		Unimmunized		Unimmunized	
		Refusal	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>
<b>British Columbia</b>	<b>49,450</b>	<b>1,408</b>	<b>11,308</b>	<b>3%</b>	<b>23%</b>
<b>Interior</b>	<b>8,224</b>	637	1,936	8%	24%
East Kootenay	949	70	253	7%	27%
Kootenay Boundary	799	111	206	14%	26%
Okanagan	3,967	308	862	8%	22%
Thompson Cariboo Shuswap	2,509	148	615	6%	24%
<b>Fraser<sup>b</sup></b>	<b>19,890</b>	<b>10</b>	<b>4,816</b>	<b>0%</b>	<b>24%</b>
Fraser East	3,642	7	1,376	0%	38%
Fraser North	6,582	1	1,459	0%	22%
Fraser South	9,666	2	1,981	0%	20%
<b>Vancouver Coastal</b>	<b>10,004</b>	<b>408</b>	<b>1,364</b>	<b>4%</b>	<b>14%</b>
Richmond	1,693	21	114	1%	7%
Vancouver	5,046	192	740	4%	15%
North Shore/Coast Garibaldi	3,265	195	510	6%	16%
<b>Island</b>	<b>7,758</b>	<b>349</b>	<b>1,844</b>	<b>4%</b>	<b>24%</b>
South Vancouver Island	3,619	132	721	4%	20%
Central Vancouver Island	2,669	161	632	6%	24%
North Vancouver Island	1,470	56	491	4%	33%
<b>Northern</b>	<b>3,574</b>	<b>4</b>	<b>1,348</b>	<b>0%</b>	<b>38%</b>
Northwest	877	1	256	0%	29%
Northern Interior	1,766	1	668	0%	38%
Northeast	931	2	424	0%	46%

**Notes:** a. "Unknown" includes all children who are unimmunized who do not have a documented refusal or contraindication, based on information in the immunization registry. This includes children who have deferred or inadvertently missed their immunizations, and those who have not had their refusal, contraindication, or immunization doses recorded.

b. PIR does not contain complete supplementary information on reasons for non-immunization (i.e., exemptions, refusals and contraindications) for FH. Therefore, the proportion of unimmunized students with unknown reasons for non-immunization is likely to be overestimated, see [Note #12](#).

\*Excluding international students.

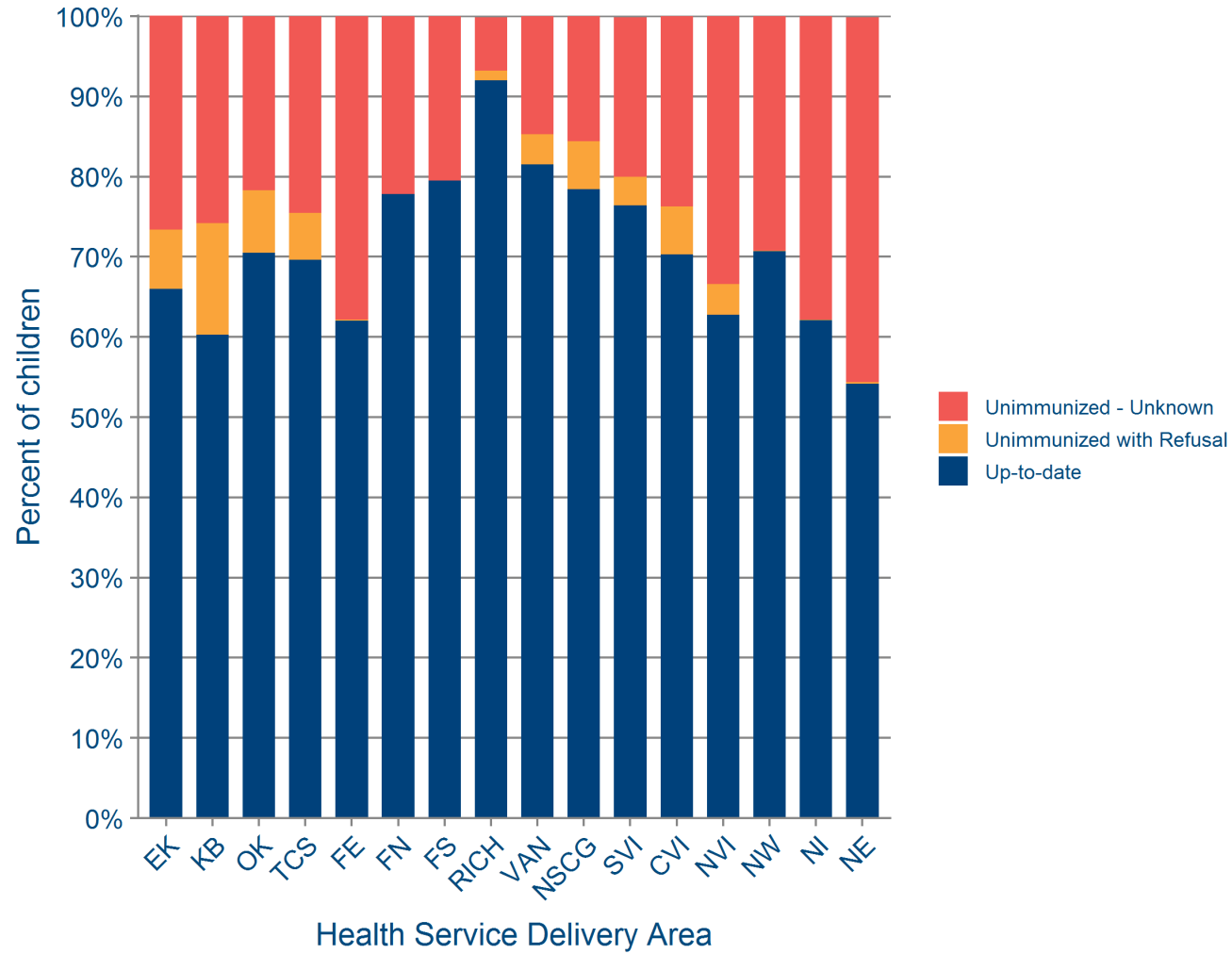


Figure 6. Reasons for non-immunization for Grade 9 students: Meningococcal Quadrivalent Conjugate vaccine, 2023

## Grade 9 students with up-to-date immunizations: Human Papillomavirus (HPV)

The HPV adolescent immunization program has had several iterations. Females who were in grade 9 in 2008/2009-2010/2011 were offered 3 doses of HPV vaccine. Females who were in grade 9 in 2011/2012 and 2012/2013 were offered 3 doses of HPV vaccine in grade 6 in 2008/2009 and 2009/2010, respectively. Uptake rates in these groups are included in the grade 6 results for 2009 and 2010 and were not reassessed in grade 9, so coverage was not assessed for grade 9 females in the 2013 report. Females who were in grade 9 in 2013/2014 received 2 doses in grade 6 and their final (third) dose in grade 9. Completion of three doses was assessed at the end of the 2013/2014 school year. Since 2014, females receiving 2 doses at least 150 days apart, with the first dose given before 15 years old, are considered complete. HPV uptake as of the end of grade 9 was assessed in 2015, but not the following two years. Assessing uptake in grade 9 was re-implemented in 2018. Starting in the 2017/2018 school year, HPV vaccine was extended to include males in grade 6. This corresponds to the grade 9 cohort of the 2020/2021 school year. For more information on the history of the HPV program see [History of Immunization in BC](#).

In 2023, 73.6% of grade 9 females and 70.7% of grade 9 males in BC were up-to-date for HPV (**Table 7**). Rates varied by HSDA, ranging from 51.7% to 89.9% for females (**Table 7** and **Figure 7**) and 52.3% to 86.1% for males (**Table 7** and **Figure 8**). HPV series initiation was similar across most HSDAs (**Figure 9**). All HSDAs had between 4% and 20% of female and male students initiate, but not complete, with the highest proportion of initiated but not completed students in Northwest HSDA.

In the 2022/2023 school year, 3% and 8% of grade 9 students in BC were partially immunized and unimmunized with a documented refusal, respectively (**Tables 8 – 10** and **Figures 10 – 12**). By HSDA, between 3% and 26% of students were unimmunized with a documented refusal (**Table 8**). There were large proportions of partially immunized and unimmunized students with an unknown reason for non-immunization ( $\geq 5\%$  for most HSDAs) recorded, particularly in NH and FH. See [Notes](#) for further information.

Table 7. Percent of Grade 9 students with up-to-date immunizations: Human Papillomavirus (HPV), by sex

HEALTH AUTHORITY / HEALTH SERVICE DELIVERY AREA	YEAR													
	2013	2014*	2015*	2016*	2017*	2018*	2019*	2020*	2021*		2022*		2023*^	
	Females	Females	Females			Females	Females	Females	Females	Males	Females	Males	Females	Males
<b>INTERIOR *</b>		<b>59.0%</b>	<b>70.0%</b>			<b>62.4%</b>	<b>63.4%</b>	<b>66.7%</b>	<b>67.9%</b>	<b>64.9%</b>	<b>69.8%</b>	<b>68.1%</b>	<b>68.1%</b>	<b>65.4%</b>
East Kootenay		67.5%	67.9%			66.7%	61.4%	70.2%	68.0%	63.3%	69.0%	71.8%	66.7%	68.3%
Kootenay Boundary		55.4%	58.2%			52.4%	56.2%	49.6%	61.1%	54.9%	59.8%	59.4%	53.8%	53.5%
Okanagan		51.6%	67.9%			60.8%	62.6%	64.6%	67.4%	64.4%	69.9%	67.7%	69.2%	65.2%
Thompson Cariboo Shuswap		70.0%	77.2%			67.4%	67.7%	74.7%	71.0%	69.4%	72.8%	70.3%	71.6%	68.0%
<b>FRASER *</b>		<b>60.7%</b>	<b>64.2%</b>			<b>61.4%</b>	<b>63.1%</b>	<b>71.4%</b>	<b>70.8%</b>	<b>66.7%</b>	<b>73.5%</b>	<b>71.1%</b>	<b>75.9%</b>	<b>73.0%</b>
Fraser East		51.1%	63.0%			57.4%	59.5%	67.0%	65.1%	59.7%	68.2%	65.2%	66.4%	67.3%
Fraser North		57.8%	60.9%			57.5%	60.4%	69.5%	71.5%	67.6%	74.3%	71.7%	76.5%	72.1%
Fraser South		66.3%	68.0%			65.8%	66.4%	74.4%	72.4%	68.8%	74.9%	72.8%	79.0%	75.7%
<b>VANCOUVER COASTAL</b>		<b>77.9%</b>	<b>76.7%</b>			<b>76.8%</b>	<b>78.6%</b>	<b>76.0%</b>	<b>74.5%</b>	<b>71.8%</b>	<b>81.6%</b>	<b>78.6%</b>	<b>80.5%</b>	<b>76.2%</b>
Richmond		89.6%	77.9%			76.9%	86.2%	85.1%	83.4%	78.8%	90.1%	88.8%	89.9%	86.1%
Vancouver		79.1%	80.1%			79.9%	80.2%	75.1%	74.2%	71.0%	83.3%	79.7%	80.4%	75.4%
North Shore / Coast Garibaldi		68.6%	70.1%			71.9%	71.9%	72.5%	69.9%	69.1%	73.8%	71.0%	75.5%	72.6%
<b>ISLAND *</b>		<b>60.2%</b>	<b>74.1%</b>			<b>62.7%</b>	<b>64.9%</b>	<b>65.3%</b>	<b>69.8%</b>	<b>68.7%</b>	<b>69.6%</b>	<b>68.1%</b>	<b>71.9%</b>	<b>70.5%</b>
South Vancouver Island		60.0%	73.3%			60.1%	63.8%	65.8%	73.1%	70.6%	69.7%	69.0%	77.1%	73.0%
Central Vancouver Island		60.8%	74.2%			64.7%	65.4%	64.8%	69.3%	68.1%	71.8%	68.8%	68.7%	70.0%
North Vancouver Island		59.6%	76.0%			66.5%	67.1%	65.0%	62.5%	64.7%	64.5%	64.5%	64.7%	65.6%
<b>NORTHERN *</b>		<b>64.0%</b>	<b>72.1%</b>			<b>65.8%</b>	<b>67.3%</b>	<b>63.1%</b>	<b>64.2%</b>	<b>58.9%</b>	<b>62.4%</b>	<b>62.4%</b>	<b>57.8%</b>	<b>55.8%</b>
Northwest		66.0%	79.6%			67.9%	65.8%	65.4%	71.0%	58.2%	60.9%	60.7%	57.4%	52.3%
Northern Interior		63.0%	70.5%			66.7%	73.3%	69.6%	67.4%	62.6%	67.6%	66.7%	61.1%	59.4%
Northeast		63.8%	67.3%			62.1%	57.3%	49.2%	50.1%	52.9%	55.0%	56.5%	51.7%	52.3%
<b>BRITISH COLUMBIA *</b>		<b>64.3%</b>	<b>70.3%</b>			<b>65.2%</b>	<b>66.8%</b>	<b>70.1%</b>	<b>70.5%</b>	<b>67.3%</b>	<b>73.1%</b>	<b>71.0%</b>	<b>73.6%</b>	<b>70.7%</b>

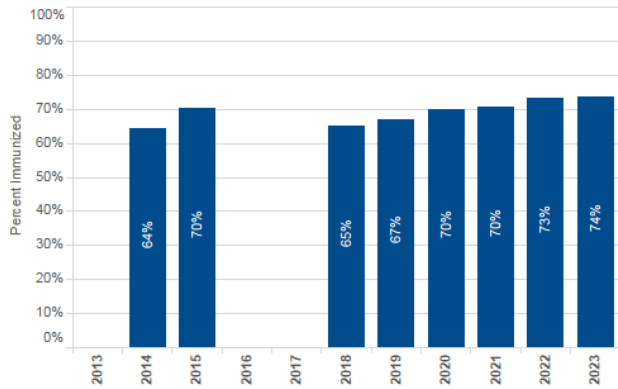
Notes: ^Excluding international students.

\* From 2014 onwards estimates for BC and some of the health authorities are not directly comparable to previous years. Some schools are not included in the 2015 estimates. See [Notes](#).

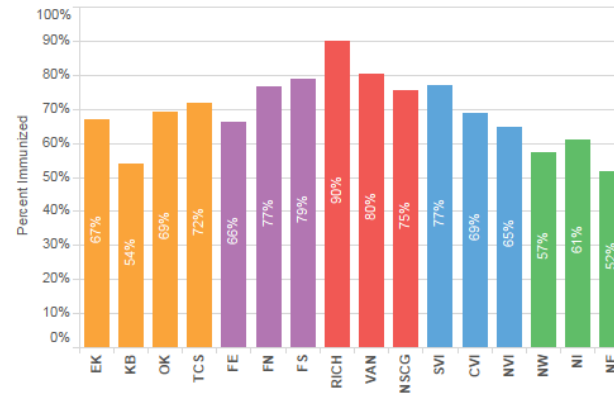
As grade 6 males became eligible for HPV immunization starting in the 2017/2018 school year, grade 9 males could only be assessed starting in 2021 (2020/2021 school year), when the 2017/2018 grade 6 male cohort reached grade 9.

### Grade 9 Female Students Immunized Human Papillomavirus (HPV) Vaccine, British Columbia

All British Columbia, by Year



By Health Service Delivery Area, 2023



By Health Authority and Year

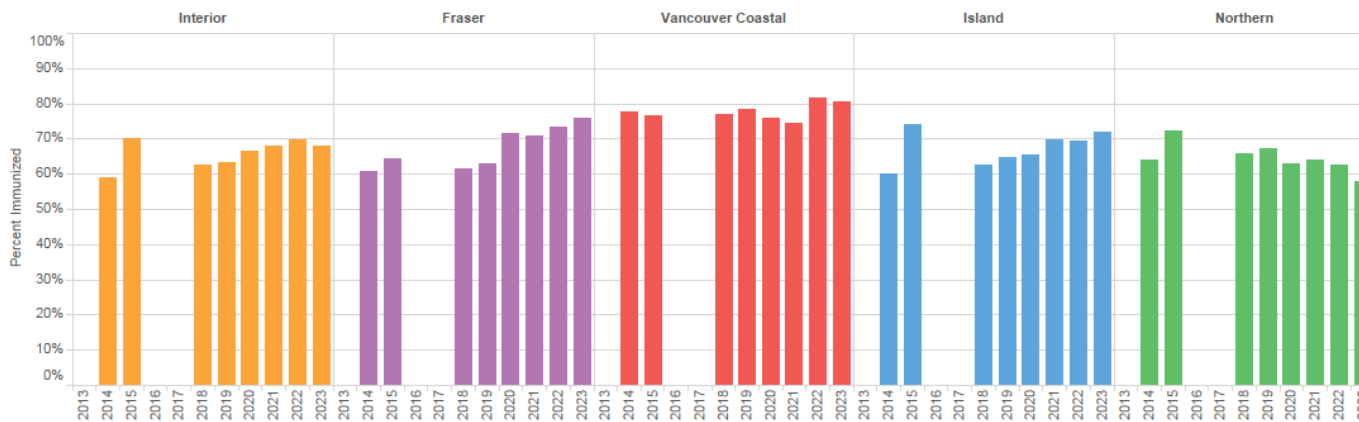
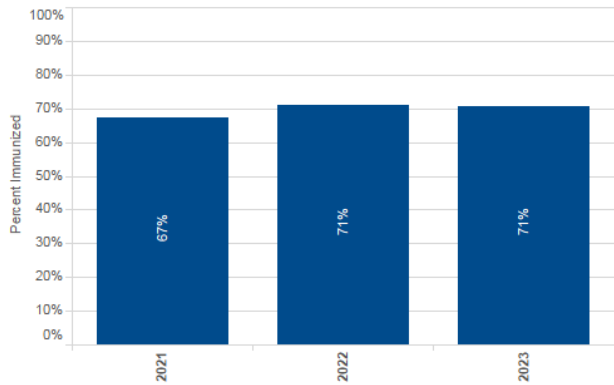


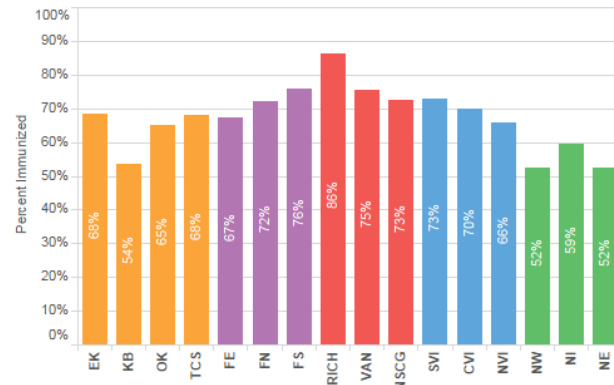
Figure 7. Percent of Grade 9 female students with up-to-date immunizations: Human Papillomavirus (HPV)

### Grade 9 Male Students Immunized Human Papillomavirus (HPV) Vaccine, British Columbia

All British Columbia, by Year



By Health Service Delivery Area, 2023



By Health Authority and Year

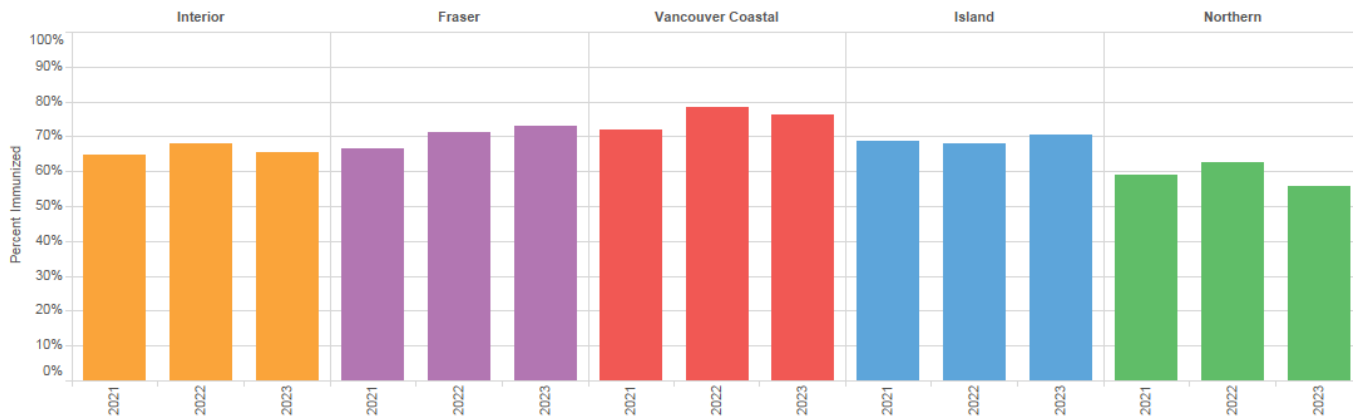


Figure 8. Percent of Grade 9 male students with up-to-date immunizations: Human Papillomavirus (HPV)

### Grade 9 Students Immunized HPV Series Initiation and Series Completion by Gender, British Columbia, 2023

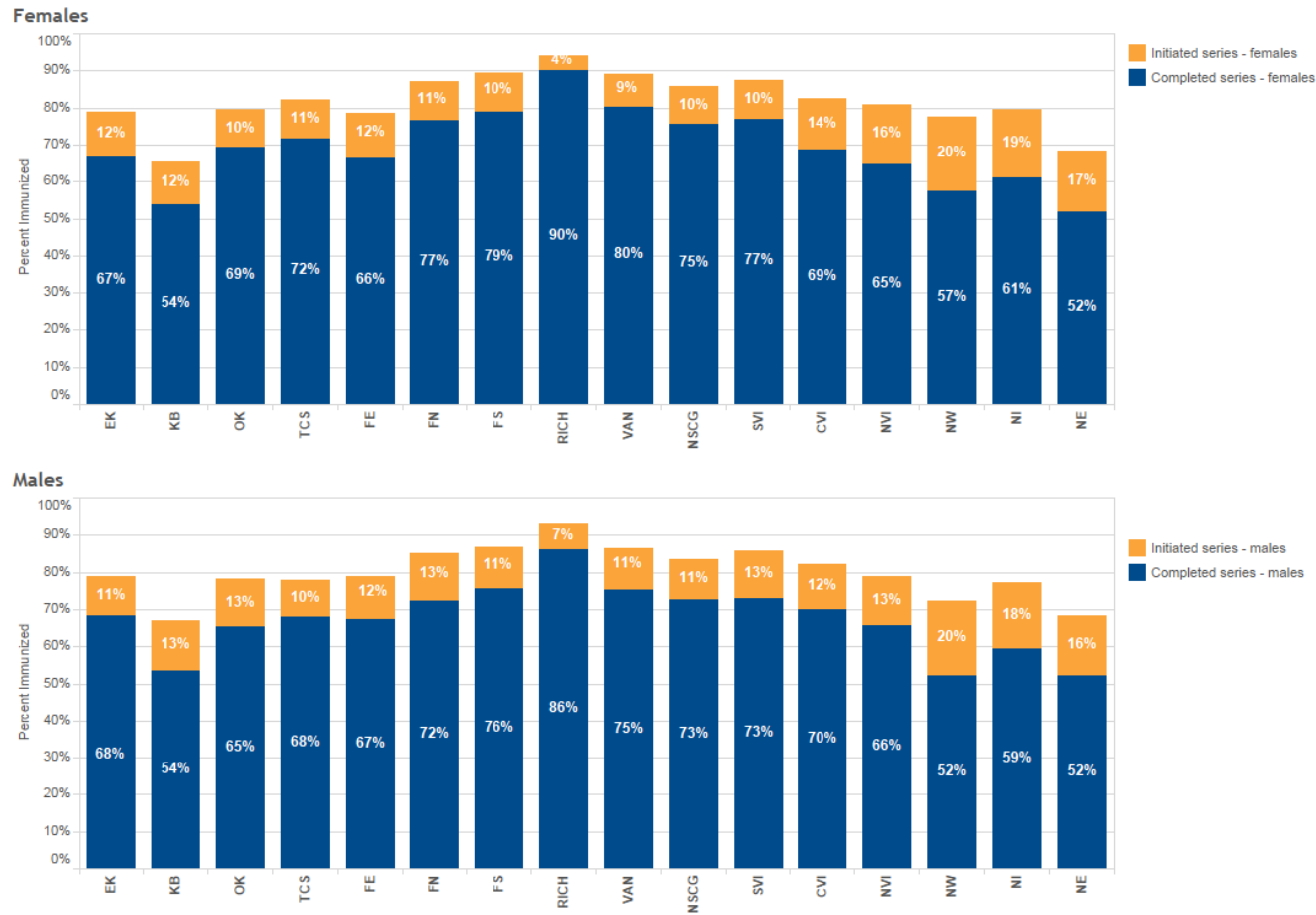


Figure 9. Percent of Grade 9 students who initiated, but did not complete, a Human Papillomavirus (HPV) vaccine series, by sex



**Table 8. Reasons for non-immunization for Grade 9 students: HPV, 2023\***

Region	Population	Count				
		Partially Immunized			Unimmunized	
		Refusal	Contraindication	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>
<b>British Columbia</b>	<b>49,450</b>	<b>1,243</b>	<b>1</b>	<b>4,515</b>	<b>3,707</b>	<b>4,334</b>
<b>Interior</b>	<b>8,224</b>	335	0	599	1,227	579
East Kootenay	949	38	0	70	132	68
Kootenay Boundary	799	50	0	50	211	59
Okanagan	3,967	165	0	302	570	265
Thompson Cariboo Shuswap	2,509	82	0	177	314	187
<b>Fraser<sup>b</sup></b>	<b>19,890</b>	<b>407</b>	<b>0</b>	<b>1,843</b>	<b>1,070</b>	<b>1,781</b>
Fraser East	3,642	94	0	341	349	424
Fraser North	6,582	148	0	631	310	606
Fraser South	9,666	165	0	871	411	751
<b>Vancouver Coastal</b>	<b>10,004</b>	<b>195</b>	<b>1</b>	<b>747</b>	<b>533</b>	<b>702</b>
Richmond	1,693	8	0	87	45	62
Vancouver	5,046	92	0	407	241	384
North Shore/Coast Garibaldi	3,265	95	1	253	247	256
<b>Island</b>	<b>7,758</b>	<b>290</b>	<b>0</b>	<b>693</b>	<b>732</b>	<b>520</b>
South Vancouver Island	3,619	127	0	297	268	213
Central Vancouver Island	2,669	109	0	237	313	160
North Vancouver Island	1,470	54	0	159	151	147
<b>Northern</b>	<b>3,574</b>	<b>16</b>	<b>0</b>	<b>633</b>	<b>145</b>	<b>752</b>
Northwest	877	3	0	173	29	192
Northern Interior	1,766	4	0	317	55	326
Northeast	931	9	0	143	61	234

Table continued on next page

Region	Population	Percent				
		Partially Immunized			Unimmunized	
		Refusal	Contraindication	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>
<b>British Columbia</b>	<b>49,450</b>	<b>3%</b>	<b>0%</b>	<b>9%</b>	<b>8%</b>	<b>9%</b>
<b>Interior</b>	<b>8,224</b>	4%	0%	7%	15%	7%
East Kootenay	949	4%	0%	7%	14%	7%
Kootenay Boundary	799	6%	0%	6%	26%	7%
Okanagan	3,967	4%	0%	8%	14%	7%
Thompson Cariboo Shuswap	2,509	3%	0%	7%	12%	8%
<b>Fraser<sup>b</sup></b>	<b>19,890</b>	<b>2%</b>	<b>0%</b>	<b>9%</b>	<b>5%</b>	<b>9%</b>
Fraser East	3,642	3%	0%	9%	10%	12%
Fraser North	6,582	2%	0%	10%	5%	9%
Fraser South	9,666	2%	0%	9%	4%	8%
<b>Vancouver Coastal</b>	<b>10,004</b>	<b>2%</b>	<b>0%</b>	<b>7%</b>	<b>5%</b>	<b>7%</b>
Richmond	1,693	0%	0%	5%	3%	4%
Vancouver	5,046	2%	0%	8%	5%	8%
North Shore/Coast Garibaldi	3,265	3%	0%	8%	8%	8%
<b>Island</b>	<b>7,758</b>	<b>4%</b>	<b>0%</b>	<b>9%</b>	<b>9%</b>	<b>7%</b>
South Vancouver Island	3,619	4%	0%	8%	7%	6%
Central Vancouver Island	2,669	4%	0%	9%	12%	6%
North Vancouver Island	1,470	4%	0%	11%	10%	10%
<b>Northern</b>	<b>3,574</b>	<b>0%</b>	<b>0%</b>	<b>18%</b>	<b>4%</b>	<b>21%</b>
Northwest	877	0%	0%	20%	3%	22%
Northern Interior	1,766	0%	0%	18%	3%	18%
Northeast	931	1%	0%	15%	7%	25%

**Notes:** a. "Unknown" includes all children who are partially immunized or unimmunized who do not have a documented refusal or contraindication, based on information in the immunization registry. This includes children who have deferred or inadvertently missed their immunizations, and those who have not had their refusal, contraindication, or immunization recorded.

b. PIR does not contain complete supplementary information on reasons for non-immunization (i.e., exemptions, refusals and contraindications) for FH. Therefore, the proportion of partially immunized and unimmunized students with unknown reasons for non-immunization is likely to be higher than actual; see [Note #12](#).

\*Excluding international students.

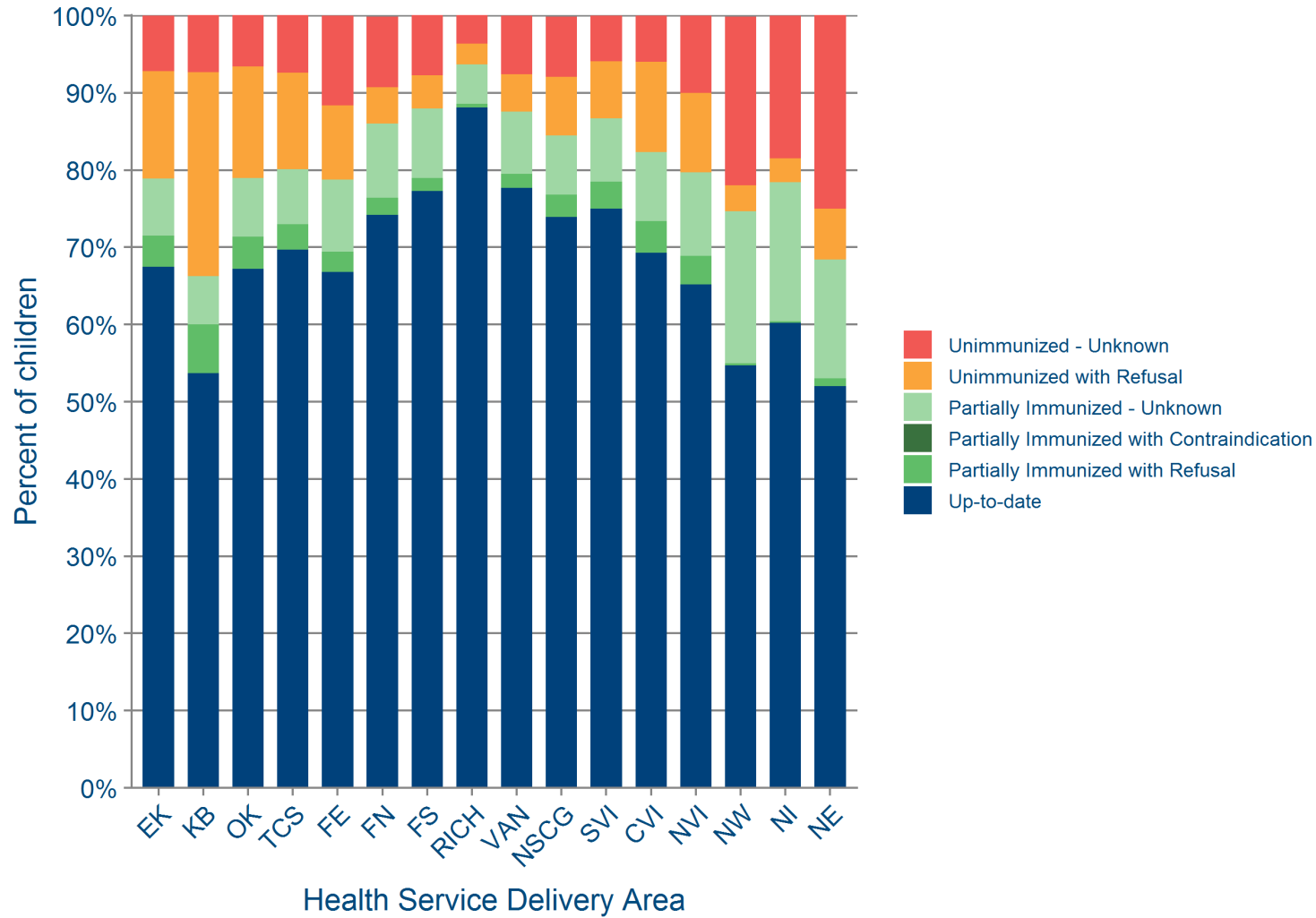


Figure 10. Reasons for non-immunization for Grade 9 students: HPV, 2023

**Table 9. Reasons for non-immunization for Grade 9 students: HPV – females, 2023\***

Region	Population	Count				
		Partially Immunized			Unimmunized	
		Refusal	Contraindication	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>
<b>British Columbia</b>	<b>23,910</b>	<b>589</b>	<b>1</b>	<b>2,077</b>	<b>1,719</b>	<b>1,930</b>
<b>Interior</b>	<b>3,990</b>	167	0	265	563	278
East Kootenay	451	25	0	30	61	34
Kootenay Boundary	403	19	0	28	106	33
Okanagan	1,940	77	0	125	266	129
Thompson Cariboo Shuswap	1,196	46	0	82	130	82
<b>Fraser<sup>b</sup></b>	<b>9,542</b>	<b>188</b>	<b>0</b>	<b>840</b>	<b>500</b>	<b>774</b>
Fraser East	1,718	50	0	160	170	198
Fraser North	3,177	61	0	273	141	271
Fraser South	4,647	77	0	407	189	305
<b>Vancouver Coastal</b>	<b>4,863</b>	<b>83</b>	<b>1</b>	<b>326</b>	<b>232</b>	<b>306</b>
Richmond	865	3	0	34	19	31
Vancouver	2,444	38	0	172	109	161
North Shore/Coast Garibaldi	1,554	42	1	120	104	114
<b>Island</b>	<b>3,794</b>	<b>143</b>	<b>0</b>	<b>337</b>	<b>355</b>	<b>231</b>
South Vancouver Island	1,787	62	0	125	133	90
Central Vancouver Island	1,324	56	0	127	158	74
North Vancouver Island	683	25	0	85	64	67
<b>Northern</b>	<b>1,721</b>	<b>8</b>	<b>0</b>	<b>309</b>	<b>69</b>	<b>341</b>
Northwest	420	1	0	84	13	81
Northern Interior	854	1	0	157	32	142
Northeast	447	6	0	68	24	118

Table continued on next page

Region	Population	Percent				
		Partially Immunized			Unimmunized	
		Refusal	Contraindication	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>
<b>British Columbia</b>	<b>23,910</b>	<b>2%</b>	<b>0%</b>	<b>9%</b>	<b>7%</b>	<b>8%</b>
<b>Interior</b>	<b>3,990</b>	4%	0%	7%	14%	7%
East Kootenay	451	6%	0%	7%	14%	8%
Kootenay Boundary	403	5%	0%	7%	26%	8%
Okanagan	1,940	4%	0%	6%	14%	7%
Thompson Cariboo Shuswap	1,196	4%	0%	7%	11%	7%
<b>Fraser<sup>b</sup></b>	<b>9,542</b>	<b>2%</b>	<b>0%</b>	<b>9%</b>	<b>5%</b>	<b>8%</b>
Fraser East	1,718	3%	0%	9%	10%	12%
Fraser North	3,177	2%	0%	9%	4%	8%
Fraser South	4,647	2%	0%	9%	4%	7%
<b>Vancouver Coastal</b>	<b>4,863</b>	<b>2%</b>	<b>0%</b>	<b>7%</b>	<b>5%</b>	<b>6%</b>
Richmond	865	0%	0%	4%	2%	4%
Vancouver	2,444	2%	0%	7%	4%	7%
North Shore/Coast Garibaldi	1,554	3%	0%	8%	7%	7%
<b>Island</b>	<b>3,794</b>	<b>4%</b>	<b>0%</b>	<b>9%</b>	<b>9%</b>	<b>6%</b>
South Vancouver Island	1,787	4%	0%	7%	7%	5%
Central Vancouver Island	1,324	4%	0%	10%	12%	6%
North Vancouver Island	683	4%	0%	12%	9%	10%
<b>Northern</b>	<b>1,721</b>	<b>0%</b>	<b>0%</b>	<b>18%</b>	<b>4%</b>	<b>20%</b>
Northwest	420	0%	0%	20%	3%	19%
Northern Interior	854	0%	0%	18%	4%	17%
Northeast	447	1%	0%	15%	5%	26%

**Notes:** a. "Unknown" includes all children who are partially immunized or unimmunized who do not have a documented refusal or contraindication, based on information in the immunization registry. This includes children who have deferred or inadvertently missed their immunizations, and those who have not had their refusal, contraindication, or immunization doses recorded.

b. PIR does not contain complete supplementary information on reasons for non-immunization (i.e., exemptions, refusals and contraindications) for FH. Therefore, the proportion of partially immunized and unimmunized students with unknown reasons for non-immunization is likely to be overestimated, see [Note #12](#).

\*Excluding international students.

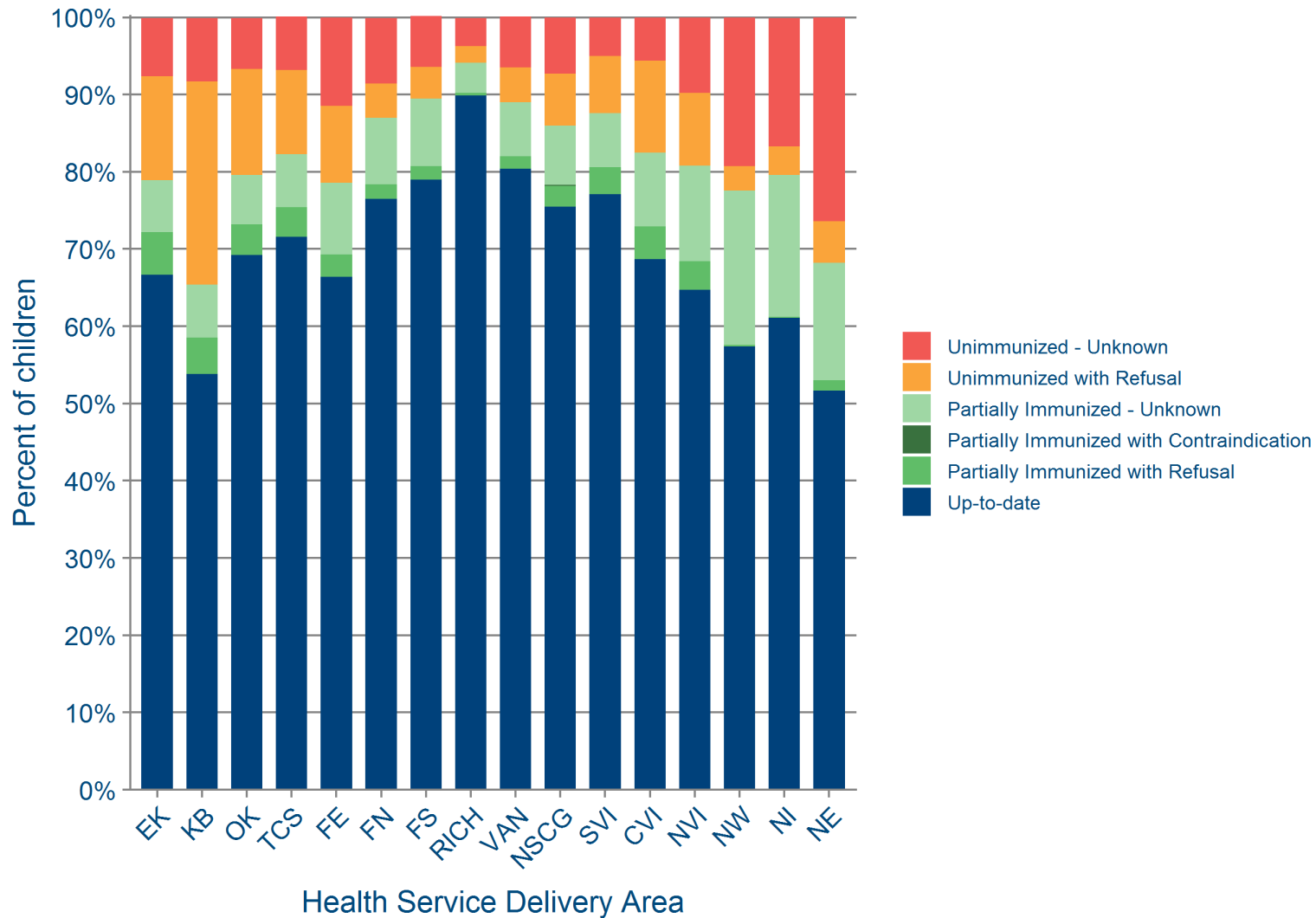


Figure 11. Reasons for non-immunization for unimmunized Grade 9 students: HPV – females, 2023

Table 10. Reasons for non-immunization for Grade 9 students: HPV – males, 2023\*

Region	Population	Count				Percent			
		Partially Immunized		Unimmunized		Partially Immunized		Unimmunized	
		Refusal	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>	Refusal	Unknown <sup>a</sup>
<b>British Columbia</b>	<b>25,518</b>	<b>654</b>	<b>2,436</b>	<b>1,987</b>	<b>2,397</b>	<b>3%</b>	<b>10%</b>	<b>8%</b>	<b>9%</b>
<b>Interior</b>	<b>4,234</b>	<b>168</b>	<b>334</b>	<b>664</b>	<b>301</b>	<b>4%</b>	<b>8%</b>	<b>16%</b>	<b>7%</b>
East Kootenay	498	13	40	71	34	3%	8%	14%	7%
Kootenay Boundary	396	31	22	105	26	8%	6%	26%	7%
Okanagan	2,027	88	177	304	136	4%	9%	15%	7%
Thompson Cariboo Shuswap	1,313	36	95	184	105	3%	7%	14%	8%
<b>Fraser<sup>b</sup></b>	<b>10,346</b>	<b>219</b>	<b>1,003</b>	<b>570</b>	<b>1,006</b>	<b>2%</b>	<b>10%</b>	<b>6%</b>	<b>10%</b>
Fraser East	1,923	44	181	179	225	2%	9%	9%	12%
Fraser North	3,404	87	358	169	335	3%	10%	5%	10%
Fraser South	5,019	88	464	222	446	2%	9%	4%	9%
<b>Vancouver Coastal</b>	<b>5,126</b>	<b>112</b>	<b>419</b>	<b>300</b>	<b>391</b>	<b>2%</b>	<b>8%</b>	<b>6%</b>	<b>8%</b>
Richmond	827	5	53	26	31	1%	6%	3%	4%
Vancouver	2,593	54	233	132	220	2%	9%	5%	8%
North Shore / Coast Garibaldi	1,706	53	133	142	140	3%	8%	8%	8%
<b>Island</b>	<b>3,959</b>	<b>147</b>	<b>356</b>	<b>377</b>	<b>288</b>	<b>4%</b>	<b>9%</b>	<b>10%</b>	<b>7%</b>
South Vancouver Island	1,831	65	172	135	123	4%	9%	7%	7%
Central Vancouver Island	1,342	53	110	155	85	4%	8%	12%	6%
North Vancouver Island	786	29	74	87	80	4%	9%	11%	10%
<b>Northern</b>	<b>1,853</b>	<b>8</b>	<b>324</b>	<b>76</b>	<b>411</b>	<b>0%</b>	<b>17%</b>	<b>4%</b>	<b>22%</b>
Northwest	457	2	89	16	111	0%	20%	4%	24%
Northern Interior	912	3	160	23	184	0%	18%	2%	20%
Northeast	484	3	75	37	116	1%	16%	8%	24%

Notes: a. "Unknown" includes all children who are partially immunized or unimmunized who do not have a documented refusal or contraindication, based on information in the immunization registry. This includes children who have deferred or inadvertently missed their immunizations, and those who have not had their refusal, contraindication, or immunization doses recorded.

b. PIR does not contain complete supplementary information on reasons for non-immunization (i.e., exemptions, refusals and contraindications) for FH. Therefore, the proportion of partially immunized and unimmunized students with unknown reasons for non-immunization is likely to be overestimated, see [Note #12](#).

\*Excluding international students.

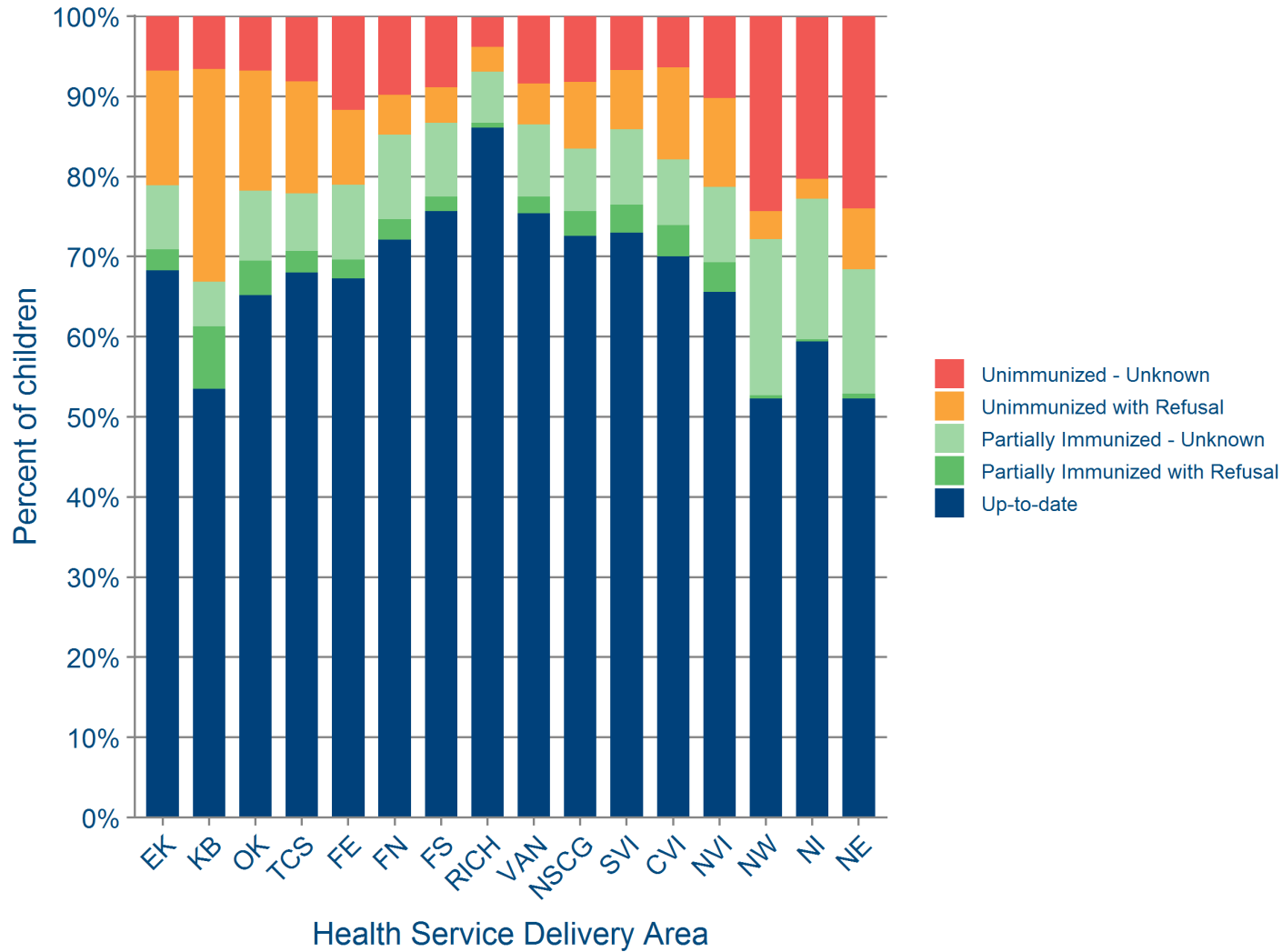


Figure 12. Reasons for non-immunization for Grade 9 students: HPV – males, 2023



## Notes

### 1. Data Sources

Provincial immunization registry (PIR) data based on the grade cohort defined as students whose records indicated they attended school within the region's service area based on MoE enrolment data as recorded in the online MyEdBC system and on student records obtained from schools not participating in MyEdBC. All doses are recorded in the provincial immunization registry if administered by public health, reported by a parent/guardian to public health (e.g., for children arriving from outside of BC), or if reported by a primary care provider to public health. Additionally, doses administered by pharmacists and entered in PharmaNet are also recorded in the provincial immunization registry.

Coverage reported for any given year reflects doses recorded as administered up to June 30 of that year (e.g., 2023 coverage is for students completing a grade by June 30, 2023).

Coverage presented in this report is based on data entry to PIR (including transmission from regional registry systems) to July 31, 2023.

### 2. Up-to-date for Age Definitions

Tetanus / Diphtheria	The proportion of students enrolled in grade 9 as of June 30 who completed a primary series of tetanus/diphtheria-containing vaccine before ten years of age and received a tetanus/diphtheria booster dose on or after the tenth birthday and by June 30, or completed a primary series of tetanus/diphtheria-containing vaccine on or after the tenth birthday and by June 30. (See Note #7)
Pertussis	The proportion of students enrolled in grade 9 as of June 30 who completed a primary series of pertussis-containing vaccine before ten years of age and received an acellular pertussis booster dose on or after the tenth birthday and by June 30, or completed a primary series of acellular pertussis-containing vaccine on or after the tenth birthday and by June 30. (See Note #7)
Meningococcal Quadrivalent Conjugate Vaccine	The proportion of students enrolled in grade 9 as of June 30 who received at least one dose of meningococcal quadrivalent conjugate vaccine in grade 7 or later.
HPV (up-to- date/series completion)	The proportion of female and male students enrolled in grade 9 as of June 30 who were up-to-date for age for HPV based on age at commencement of series.
HPV (series initiation, but not completion)	The proportion of female or male students enrolled in grade 9 as of June 30 who received at least one dose of HPV vaccine, but did not complete a 2-dose or a 3-dose series.

All analyses were conducted using business rules which calculated ages and time intervals at receipt of immunization. Each dose was counted as a valid dose only if given at or after the earliest eligible age, or at a time interval equal to or greater than the shortest recommended interval.

See: [Minimum Intervals Between Doses](#)

For HPV, data are shown for series completion, and series initiation but not completion; these categories are mutually exclusive.

### 3. Changes in Data Sources

The data sources used for each of the HAs have changed over time as follows:

Health Authority	Year											
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
IH	Health Authority Summary Reports*					Pan-Grade*						
FH	Health Authority Summary Reports					Pan-Grade						
VCH	Health Authority Summary Reports											
ISLH	Health Authority Summary Reports	Pan-Year/MoE				Pan-Grade						
NH	Health Authority Summary Reports								Pan-Grade			

**Health Authority Summary Reports:** HAs provided summary reports including the number of students in grade 9 and, of those, the numbers up-to-date for each measure. These were usually based on class lists provided by schools and HA records of immunizations given.

**Pan-Grade:** The PIR records were included for children with active records that indicated they were in grade 9 as of June 30 of the school year of interest.

**Pan-Year/MoE:** The numerator was the number of children in the birth cohort for which the majority of children attended grade 9 during the school year of interest with active records in PIR who were up-to-date for the specified agent. The denominator was the number of children in the birth cohort of interest attending grade 9 in schools within the HA, based on estimates derived from BC MoE enrolment statistics.

\* In 2017, the Rutland Branch in the Okanagan HSDA used Pan-Grade, while the rest of IH used Health Authority Summary Reports.

- The numerator used to calculate percent uptake was the number of students enrolled in grade 9 as of June 30 of the specified year who were up-to-date for age for the vaccine in question (per up-to-date for age definitions).
- Unless otherwise indicated, the denominator used to calculate percent uptake was the number of students enrolled in grade 9 as of June 30 of the specified year, according to class lists in PIR or PARIS (for VCH).
- Students were included in the numerator and denominator if they had a value of 'Grade 9', 'Home Schooled', or 'Secondary ungraded' in the Grade variable in PIR, and met the required birth date range. For the 2023 report, students born between January 1, 2007 and December 31, 2009 were included.
- Some regions have been unable to routinely ascertain completion of the primary series for tetanus/diphtheria and pertussis. In these regions, the numbers reported represent the proportions of students enrolled in grade 9 as of June 30 who received any tetanus/diphtheria- or pertussis-containing vaccine within the past five years and by June 30, regardless of whether the primary series was complete. The regions unable to completely ascertain primary series completion in tetanus/diphtheria and pertussis were:

Years	Regions
2013-2014	IH, FH, ISLH
2015	FH, ISLH
2016-2017	FH

- Ideally, numerators and denominators should be taken from the same data source. Using different data sources for numerators and denominators can result in inaccurate results, including coverage calculations

exceeding 100%. Immunization coverage rates approaching 100% in ISLH in 2014-2017 are likely over-estimates resulting from the use of different data sources for numerators and denominators.

9. Due to a difference in methods used for enumerating the numerator and denominator, the ISLH results, and corresponding provincial data for 2014 to 2017 are not directly comparable to previous or later years. Related to implementation of the new public health information system (Panorama) in July 2013, ISLH was unable to reconcile all records of students enrolled in schools; therefore coverage was calculated using numerator data from Panorama on active records for those born in 2002 (for 2014), 2003 (for 2015), 2004 (for 2016) and 2005 (for 2017) without the ability to confirm school/grade 9 enrolment; denominators were aggregate data from the BC MoE's data on enrolment in grade 9 to attempt to account for those who have moved out of ISLH. This change has led to inaccurate ascertainment of coverage rates, which may be higher or lower than true coverage rates depending on the antigen.
10. Due to the difference in methods used to calculate coverage in the Rutland branch in the Okanagan HSDA in 2017, the Okanagan and IH results, and corresponding provincial data for 2017 are not directly comparable to previous years.
11. Due to changes in data sources used to calculate coverage in IH, ISLH, and FH from 2018, and NH from 2020, the FH, ISLH, IH, and NH corresponding provincial data are not directly comparable to previous years.
12. Due to ongoing development of the interfaces between the FH information system and the PIR, supplementary information on reasons for non-immunization (i.e., exemptions, refusals and contraindications) is not complete. Therefore, the proportion of partially immunized and unimmunized grade 9 students with unknown reasons for non-immunization is likely to be overestimated for this HA. The proportion of children partially immunized or unimmunized due to refusals or contraindications is likely to be underestimated.
13. In the 2020/2021 school year, ongoing prioritization of the COVID-19 pandemic response affected some of the public health resources available for school-based immunization programs. This was most significant in FH, which did not complete any school-based clinics in the 2020/2021 school year. In the 2021/2022 school year, school-based clinics were offered in all HAs including some providing catch-ups for grade 10 students to receive the grade 9 milestone vaccines. Ongoing catch-up will be offered for subsequent years, as required. In instances when coverage did not return to pre-pandemic levels it may reflect some ongoing operational impacts of the COVID-19 response (e.g., increases in absenteeism among schoolchildren due to illness, lack of staffing resources in remote and rural areas, or competing priorities in public health departments) or changes in data sources between pre- and post-pandemic periods.
14. The COVID-19 pandemic was declared in March 2020. This pandemic initially resulted in a province-wide shut down, which impacted the provision of public health services including routine immunization services. As a result, some coverage rates were lower in 2020 than previous years, particularly for the doses scheduled to be received in the last few months of the 2019/2020 school year.
15. Starting in 2018 for IH, ISLH and FH, and 2020 for NH, school and grade information is attached to students' records in the PIR in two ways:
  - a. For schools using either the MyEdBC or the CIMS information systems and who have signed a letter of agreement, information is uploaded from a MoE extract into PIR using a tool called STIX. As of September 2023 and for the 2022/2023 school year, this process included 95% of students in schools registered with the BC MoE. HA staff reconcile the school information against the PIR record when discrepancies occur.
  - b. For schools using other information systems, HA staff may manually enter or upload the school and grade information. The process of adding enrolment details may not be completed for all HAs and grades. Most HAs prioritize milestone grades for enrolment data entry (kindergarten, Grade 6 and Grade 9). A small number of schools may not provide class lists.
16. Coverage results by HA and HSDA are reported based on the location of the school.

17. The following school types are included in the PIR: Alternate, Distance, Distance Learning, Independent, Long Term Program, Self-Directed, Short Term Program, and Standard.
18. The Gender variable in the PIR contains the following values: Male, Female, Undifferentiated, Unknown. For the purpose of this report, only coverage for males and females were reported in the tables stratified by gender as the proportion of those in the Undifferentiated and Unknown categories comprise <0.01% of the total population. Those in the Undifferentiated and Unknown categories are included in the tables that report coverage values for the total population.
19. Due to HPV program changes in the 2014/2015 school year, HPV coverage statistics could not be obtained for three schools in the Fraser East, eleven schools in the Fraser South, and three schools in the Okanagan HSDAs. These schools account for approximately 13%, 27%, and 36% of grade 9 girls in Fraser East, Fraser South, and Okanagan, respectively.
20. In 2015, one school in the Kootenay Boundary HSDA did not provide public health with grade 9 class lists. As the children attending this school could not be identified, they could not be included in the immunization coverage analysis. Based on information posted on the BC MoE's website, this school accounted for approximately 0.9% of grade 9 students in Kootenay Boundary.
21. In 2017, the first year of the meningococcal quadrivalent conjugate vaccine program for grade 9 students, some parents are believed to have refused the vaccine for their children, thinking it was the same as the meningococcal C conjugate vaccine their children received in grade 6.
22. While all grade 9 students attending BC schools are intended to be included in this report, records for some students may be incomplete. Examples may include those who attend schools that do not receive services from regional public health, including some schools serviced by First Nations Health Services Organizations, some distance/distributed learning schools and schools refusing any contact with public health due to religious or philosophical reasons.
23. International students who attend school in BC are classified into two categories in the provincial immunization registry based on their length of stay: 1) short stay (<6 months) and 2) long stay (≥6 months). HAs attempt to collect immunization records for all long stay students in the province, however the length of stay is unknown for the majority of international students in the registry. Thus, immunization records may be incomplete for international students and coverage is likely underestimated for this population. Given that there are larger proportions of international students in high school (i.e., grades 8-12), analyses for grade 9 students were stratified by international student status and reported separately in the [Appendix](#).
24. Data may not be comparable by HSDA from year to year due to ongoing changes in data collection methods and changes in geographic health area boundaries. However, assuming consistency in reporting practices, overall trends in immunization coverage can be assessed by examining these data.

## Acknowledgements

We acknowledge all BC health authorities in the contribution of information for this report.

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## Appendix

Table A1. Percent of grade 9 international students up-to-date for diphtheria/tetanus, pertussis, meningococcal quadrivalent, and HPV, 2023

HEALTH AUTHORITY / HEALTH SERVICE DELIVERY AREA	Denominator	ANTIGEN							
		Diphtheria/Tetanus		Pertussis		Meningococcal Quadrivalent		HPV	
		Count up-to-date	Percentage	Count up-to-date	Percentage	Count up-to-date	Percentage	Count up-to-date	Percentage
<b>INTERIOR</b>	<b>219</b>	<b>75</b>	<b>34%</b>	<b>75</b>	<b>34%</b>	<b>89</b>	<b>41%</b>	<b>39</b>	<b>18%</b>
East Kootenay	16	1	6%	2	13%	3	19%	0	0%
Kootenay Boundary	20	7	35%	7	35%	10	50%	6	30%
Okanagan	121	48	40%	47	39%	55	45%	21	17%
Thompson Cariboo Shuswap	62	19	31%	19	31%	21	34%	12	19%
<b>FRASER</b>	<b>1,726</b>	<b>659</b>	<b>38%</b>	<b>653</b>	<b>38%</b>	<b>894</b>	<b>52%</b>	<b>411</b>	<b>24%</b>
Fraser East	171	48	28%	48	28%	69	40%	37	22%
Fraser North	639	304	48%	302	47%	364	57%	168	26%
Fraser South	916	307	34%	303	33%	461	50%	206	23%
<b>VANCOUVER COASTAL</b>	<b>707</b>	<b>485</b>	<b>69%</b>	<b>481</b>	<b>68%</b>	<b>510</b>	<b>72%</b>	<b>383</b>	<b>54%</b>
Richmond	149	126	85%	125	84%	125	84%	97	65%
Vancouver	402	270	67%	267	66%	279	69%	215	53%
North Shore / Coast Garibaldi	156	89	57%	89	57%	106	68%	71	46%
<b>ISLAND</b>	<b>446</b>	<b>123</b>	<b>28%</b>	<b>118</b>	<b>26%</b>	<b>132</b>	<b>30%</b>	<b>79</b>	<b>18%</b>
South Vancouver Island	289	89	31%	85	29%	96	33%	53	18%
Central Vancouver Island	81	28	35%	27	33%	27	33%	20	25%
North Vancouver Island	76	6	8%	6	8%	9	12%	6	8%
<b>NORTHERN</b>	<b>39</b>	<b>20</b>	<b>51%</b>	<b>20</b>	<b>51%</b>	<b>20</b>	<b>51%</b>	<b>15</b>	<b>39%</b>
Northwest	3	1	33%	1	33%	3	100%	1	33%
Northern Interior	28	18	64%	18	64%	16	57%	13	46%
Northeast	8	1	13%	1	13%	1	13%	1	13%
<b>BRITISH COLUMBIA</b>	<b>3,137</b>	<b>1,362</b>	<b>43%</b>	<b>1,347</b>	<b>43%</b>	<b>1,645</b>	<b>52%</b>	<b>939</b>	<b>30%</b>

**Table A2. Percent of grade 9 international students who have completed or initiated a HPV series, by gender, 2023**

HEALTH AUTHORITY / HEALTH SERVICE DELIVERY AREA	HPV series completion		HPV series initiation but not completion		Total	
	Female	Male	Female	Male	Female	Male
INTERIOR	23%	14%	26%	23%	49%	37%
FRASER	28%	21%	23%	32%	50%	52%
VANCOUVER COASTAL	58%	52%	19%	20%	77%	72%
ISLAND	19%	17%	15%	13%	33%	30%
NORTHERN	33%	43%	11%	14%	44%	57%
BRITISH COLUMBIA	<b>33%</b>	<b>27%</b>	<b>21%</b>	<b>26%</b>	<b>53%</b>	<b>52%</b>

Table A3. Reasons for non-immunization definitions

Measure	Definition
Partially Immunized with Contraindication	<p><i>For agents/antigens requiring more than one dose.</i></p> <p>Does not meet any of the previous definitions AND            Received at least one valid dose of the agent/antigen of interest AND            Type of Special Consideration = Contraindication AND            Reason for Special Consideration is valid for the agent/antigen of interest AND            Special Consideration Effective From Date &lt;= June 30 AND            Special Consideration Effective To Date &gt; June 30 OR &lt;blank&gt;</p>
Partially Immunized with Refusal	<p><i>For agents/antigens requiring more than one dose.</i></p> <p>Does not meet any of the previous definitions AND            Received at least one valid dose of the agent/antigen of interest AND            Type of Special Consideration = Exemption            Reason for Special Consideration = Client Refusal OR Parental/Guardian Refusal            Special Consideration Effective From Date &lt;= June 30</p>
Partially Immunized - Unknown	<p><i>For agents/antigens requiring more than one dose.</i></p> <p>Does not meet any of the previous definitions AND            Received at least one valid dose of the agent/antigen of interest</p> <p><b>Note:</b> This category will include children with at least one valid dose of the agent/antigen of interest. These children may have any of the following: invalid doses recorded; invalid refusals, exemptions, or contraindications for the agent/antigen of interest; valid refusals, exemptions, or contraindications that do not apply to the agent/antigen of interest; or no recorded refusals, exemptions, or contraindications for any agent/antigen.</p>
Unimmunized with Contraindication	<p>Does not meet any of the previous definitions AND            Has no recorded valid dose(s) of the agent/antigen of interest AND            Type of Special Consideration = Contraindication AND            Reason for Special Consideration is valid for the agent/antigen of interest AND            Special Consideration Effective From Date &lt;= June 30 AND            Special Consideration Effective To Date &gt; June 30 OR &lt;blank&gt;</p>
Unimmunized with Refusal	<p>Does not meet any of the previous definitions AND            Has no recorded valid dose(s) of the agent/antigen of interest AND            Type of Special Consideration = Exemption            Reason for Special Consideration = Client Refusal OR Parental/Guardian Refusal            Special Consideration Effective From Date &lt;= June 30</p>
Unimmunized - Unknown	<p>Does not meet any of the previous definitions AND            Has no recorded valid dose(s) of the agent/antigen of interest</p> <p><b>Note:</b> This category will include children with no recorded valid dose(s) of the agent/antigen of interest. These children may have any of the following: invalid doses recorded; invalid refusals, exemptions, or contraindications for the agent/antigen of interest; valid refusals, exemptions, or contraindications that do not apply to the agent/antigen of interest; or no recorded refusals, exemptions, or contraindications for any agent/antigen.</p>

**Table A4. Minimum Intervals Between Doses**

Antigen/Agent	Minimum Age or Minimum Time Interval Between Eligible Doses			
	Dose 1 <sup>A</sup>	Dose 2	Dose 3	Dose 4
Tetanus/Diphtheria and Pertussis				
Series started at any age	42 days	28 days	28 days	24 weeks <sup>B</sup>
Dose 1 received after 1 year and dose 3 after 10 years of age	1 year	28 days	24 weeks <sup>C</sup>	
Meningococcal Quadrivalent Conjugate	11 years + 8 months			
HPV				
2 Dose schedule (for dose 1 given age 9 to 14)	9 years	150 days		
3 Dose schedule (for dose 1 given age 15+)	15 years	28 days	12 weeks <sup>D</sup>	

- A. Dose 1 refers to the earliest age a child can receive the initial dose.
- B. Most children immunized according to BC schedule would have received 6 doses. To be considered up-to-date, the last dose must be received on or after 10 years of age.
- C. To be considered up-to-date, dose 3 must be received on or after 10 years of age.
- D. Dose 3 must be given at least 24 weeks after dose 1.