

Immunization Coverage in Children by the Seventh Birthday

2016-2025

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Contact Information

Immunization Programs and Vaccine Preventable Diseases Service

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Report is available [here](#).

Acknowledgements

We gratefully acknowledge the residents of BC whose data were integrated in the information presented here and all BC health authorities for the contribution of information for this report.

We acknowledge the Title and Rights of BC First Nations who have cared for and nurtured the lands, air and waters for all time, including the xʷməθkʷəy̓əm (Musqueam), Skwxwú7mesh Úxwumixw (Squamish Nation), and səliłwətaʔ (Tsleil-Waututh Nation) on whose unceded, occupied, and ancestral territory BCCDC is located. As a provincial organization, we also recognize and acknowledge the inherent Title and Rights of BC First Nations whose territories stretch to every inch of the lands colonially known as “British Columbia”.

BC is also home to many First Nations, Métis, and Inuit people from homelands elsewhere in Canada. We recognize the distinct rights of First Nations, Inuit, and Métis people and BCCDC is beginning its work to uphold a [distinctions-based approach](#) to Indigenous data sovereignty and self-determination. All Indigenous Peoples who live in BC have rights to self-determination, health and wellness, and respectful use of their data in alignment with Indigenous data governance principles, including but not limited to [OCAP®](#).

BCCDC is working to address the consequences of settler-colonial policies, which continue to have effects on all Indigenous Peoples living in the province. Consistent with the [Coast Salish teaching of Thee eat \(truth\)](#) gifted to PHSA by Coast Salish Knowledge Keeper Siem Te Ta-in, we recognize that ongoing settler colonial harms and ideology in BC undermine the inherent rights of Indigenous Peoples who live in BC and significantly contributes to health inequities and data gaps. For further information, please see “[In Plain Sight: Addressing Indigenous-specific Racism and Discrimination in B.C. Health Care](#)”. We also recognize the direct impact of colonial policies, which led to violations of patient autonomy and consent, resulting in vaccine hesitancy and mistrust among Indigenous Peoples in Canada:

- [TB vaccine experimentation in Saskatchewan in the 1930s and 1940s](#)
- [Medical experimentation and the roots of COVID-19 vaccine hesitancy among Indigenous Peoples in Canada](#)
- [Vaccine mistrust: A legacy of colonialism](#)

While the data shown in this report represent BC residents, there is no stratification by Indigeneity and as such, the results are not reflective of the situation for First Nations, Métis and Inuit Peoples and communities. First Nations children may also be disproportionately under-represented in the immunization registry data. Please see the [Limitations](#) section of the Data Notes for further information.

Abbreviations

Health Authorities

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

Additional abbreviations

BC	British Columbia	DTaP	Diphtheria, tetanus, acellular pertussis
MoE	Ministry of Education	DTap-IPV	Diphtheria, tetanus, acellular pertussis, polio
HA	Health Authority	MMRV	Measles, mumps, rubella, varicella
HSDA	Health Service Delivery Area	Tdap-IPV	Tetanus, diphtheria, acellular pertussis, polio
MyEdBC	MyEducation BC		
PIR	Provincial Immunization Registry		
PARIS	Primary Access Regional Information System		

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

Executive Summary

Immunization coverage is routinely assessed at milestone ages for children in British Columbia (BC). This report outlines immunization coverage among seven-year-olds from 2016 to 2025 for nine antigens: diphtheria, tetanus, pertussis, polio, hepatitis B, measles, mumps, rubella, and varicella; as well as overall up-to-date coverage (i.e., those up-to-date for all antigens). Infants in BC are currently recommended to receive thirteen doses of seven different vaccines. In addition to infant vaccines, children in BC are [recommended](#) to receive a single booster dose of two different vaccines (Tdap-IPV and MMRV) between the ages of 4-6 years which protect against tetanus, diphtheria, pertussis, polio and measles, mumps, rubella, and varicella.

The proportion of BC seven-year-olds who are up-to-date for all routine immunizations declined from 72.5% in 2021 to 63.8% in 2024, followed by an increase to 65.3% in 2025. Up-to-date coverage also increased in 2025 from the previous year across all regional health authorities except Northern Health (NH), with increases ranging from 0.6% in Interior Health (IH) to 3.6% in Island Health (ISLH). Up-to-date coverage in NH has declined since 2022, with a further 4.1% decrease from 2024 to 2025. Provincial coverage was highest for rubella (87.6%) and hepatitis B (82.4%), while coverage for DTaP, DTaP-IPV, polio, measles, mumps, and varicella ranged from 69.5% to 71.8%.

In recent years, the most significant declines in immunization coverage were observed for antigens contained in the school-entry (4-6 years) booster doses, including DTaP, polio, measles, mumps, and varicella. These declines may be partially explained by the COVID-19 pandemic, which impacted both receipt of school-entry booster doses and immunization record collection for children born between 2014 and 2016, who turned 4 to 6 years of age in 2020. Up-to-date immunization status at the seven-year-old milestone was assessed for these cohorts in 2022 (2014 birth cohort), 2023 (2015 birth cohort), and 2024 (2016 birth cohort). The current report assesses coverage for children born in 2017, who turned 4 years of age in 2021 and whose receipt of school-entry booster doses may have been partially impacted by the COVID-19 pandemic. While coverage levels in 2025 remain below those observed prior to the pandemic, coverage increased provincially from 2024 across all antigens included in the school-entry booster series by 1.4-1.9%. In comparison to 2024, coverage increased in 2025 for all antigens in IH, FH, VCH, and ISLH (0.6-4.2% increase), while in NH coverage decreased across all antigens (2.1-5.0% decrease).

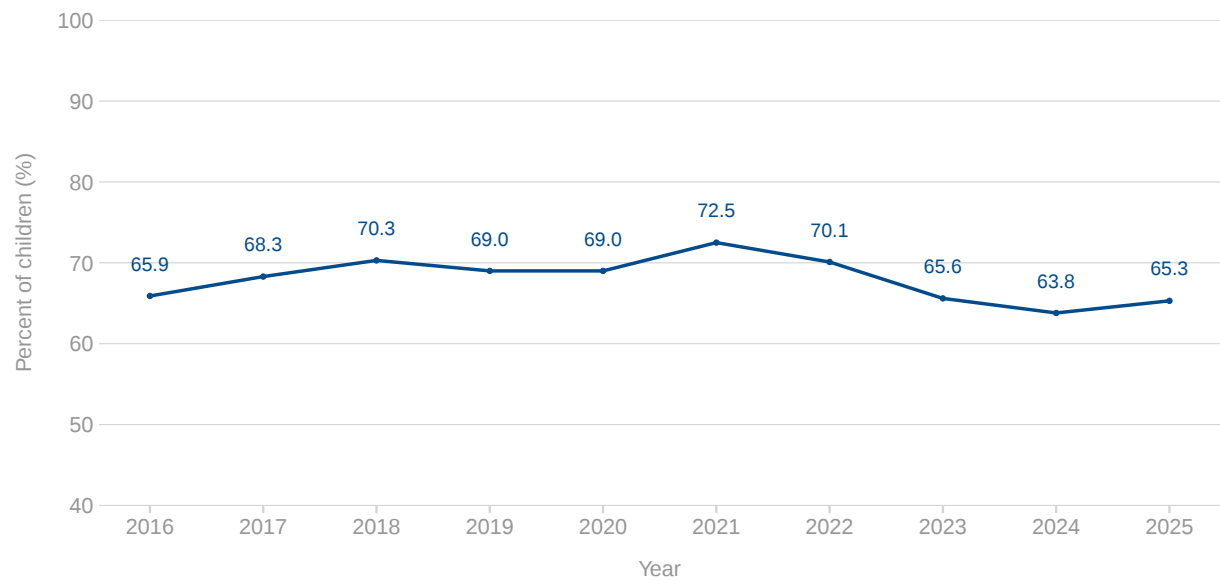
Since 2021, the proportion of seven-year-olds in BC with documented refusals to all vaccines has been relatively stable, slightly decreasing from 1.3% in 2023 to 1.0% in 2025. At the health authority level, refusal rates ranged from 0.6-1.7%, with the highest refusal rate observed in IH (1.7%). Reasons for non-immunization (i.e., documented refusals, exemptions, or contraindications) were assessed for each individual agent/antigen. Across all agents/antigens, children who were not up-to-date for their immunizations often did not have a documented refusal, exemption, or contraindication for the agent/antigen of interest in the Provincial Immunization Registry (PIR) – i.e., were partially immunized for unknown reasons or unimmunized for unknown reasons. For DTaP, polio, measles, mumps, and varicella, BC seven-year-olds who were not considered immunized up-to-date were most commonly partially immunized for unknown reasons (14.9-17.9%), while for hepatitis B and rubella (one dose only), BC seven-year-olds who were not up-to-date were most commonly unimmunized for unknown reasons (10.8% for hepatitis B, 11.1% for rubella).

Every year there is a proportion of the cohort assessed for immunization coverage status for whom we have no information pertaining to immunizations; the immunization status of these children is unknown. In 2025, 8.8% of seven-year-olds in BC's 2017 birth cohort had no records in the PIR for the assessed antigens (category: Unimmunized - Unknown: No Immunization Record) (refer to reasons for non-immunization [definitions](#) for further information on inclusion criteria for this measure). Across health authorities, the proportion of seven-year-olds in the 2017 birth cohort with no records in the PIR for the included antigens ranged from 5.2% in ISLH to 11.6% in Fraser Health (FH).

Please refer to the [data notes](#) for additional information and data limitations. Data tables used to create the figures in this report can be downloaded [here](#).

Immunization Coverage in BC

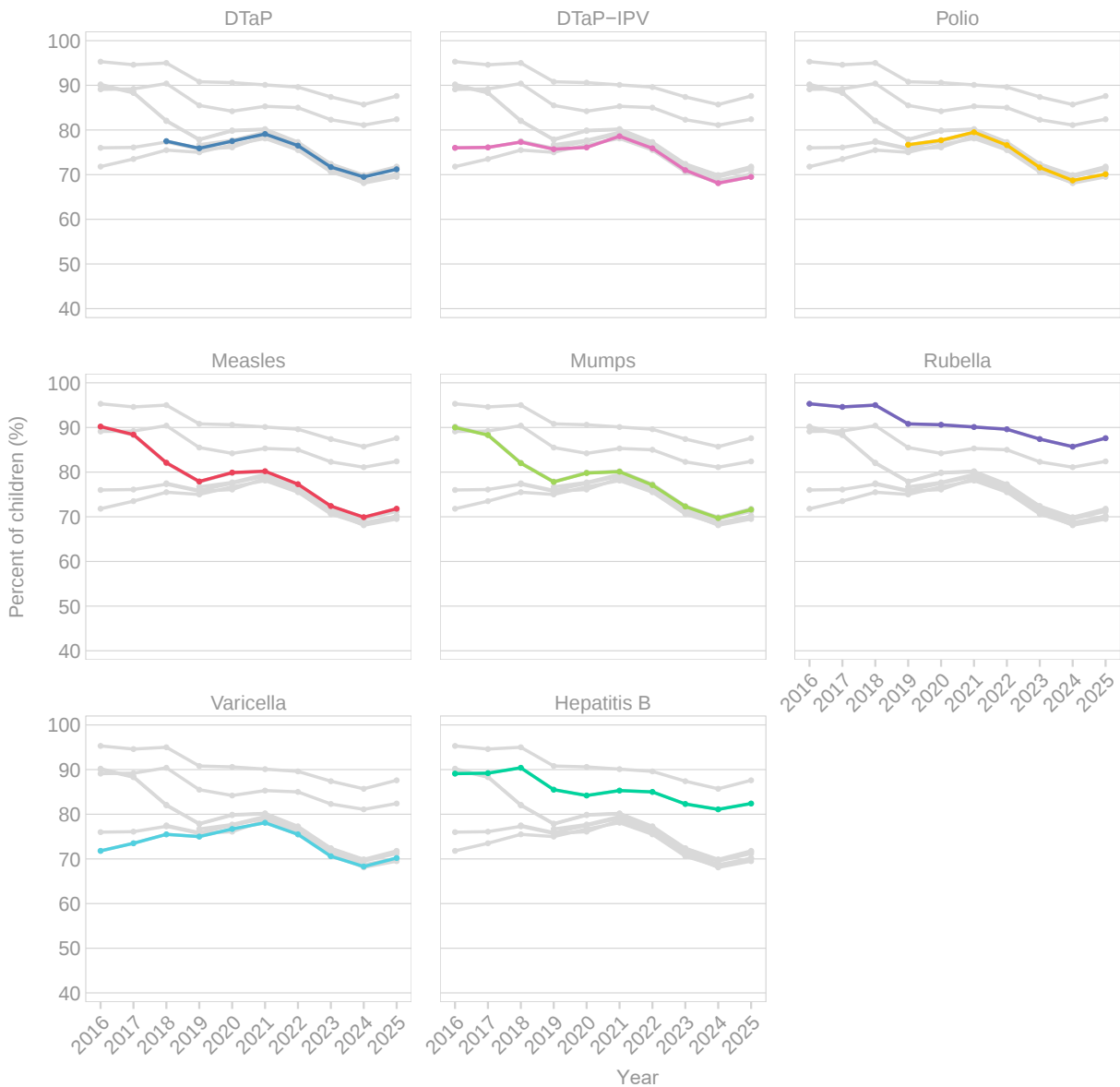
Up-to-date for Age



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 1. Up-to-date for age coverage by year, 7-year-olds, British Columbia

Coverage by Antigen

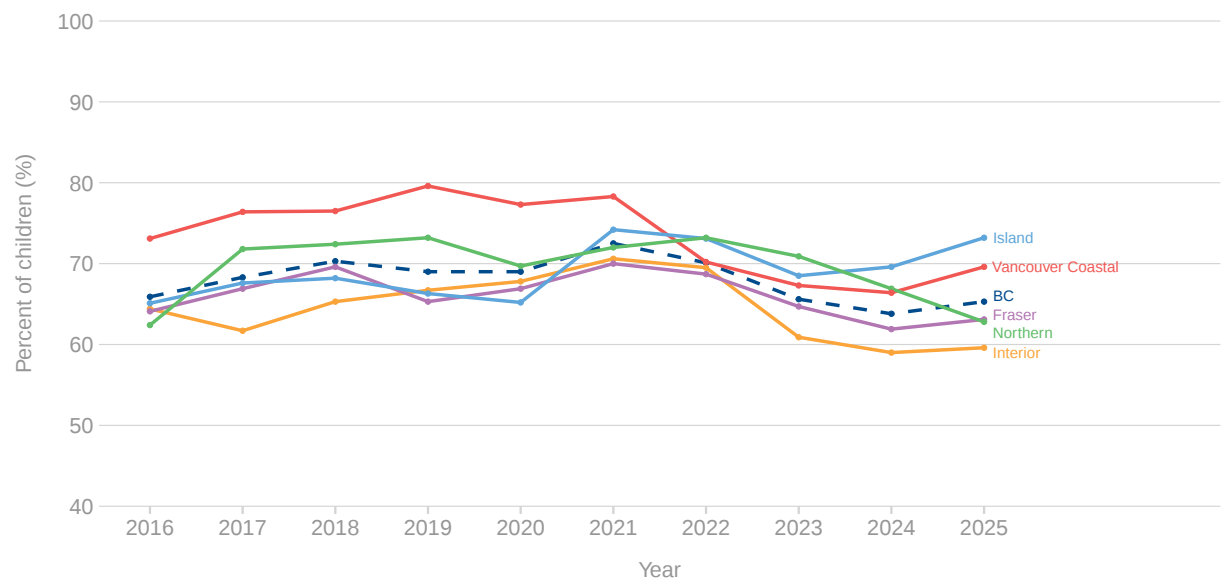


Note: The y-axis for this figure starts at 40% for clearer data visualization. The coloured lines represent the specified antigens.

Figure 2. Comparison of coverage for all antigens by year, 7-year-olds, British Columbia

Immunization Coverage by Regional Health Authority

Summary



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 3. Up-to-date for age by year and health authority, 7-year-olds, British Columbia

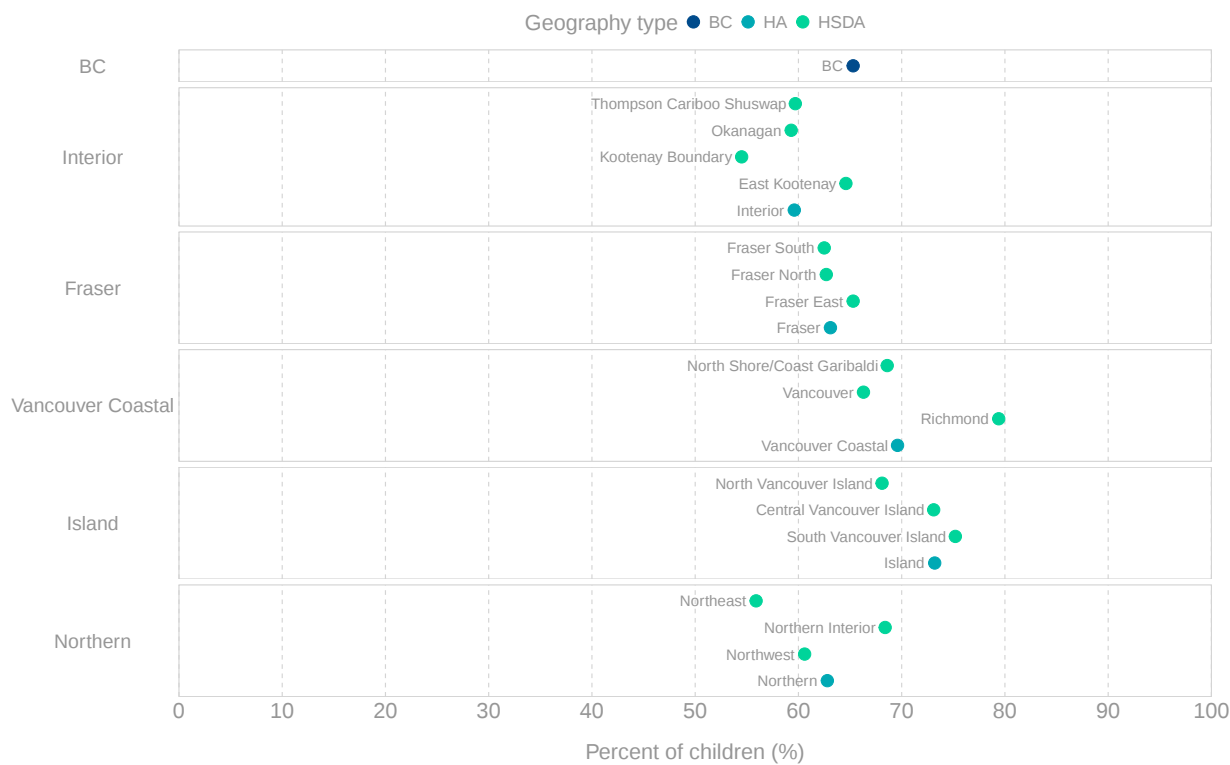


Figure 4. Up-to-date for age by geographic region, 7-year-olds, British Columbia, 2025

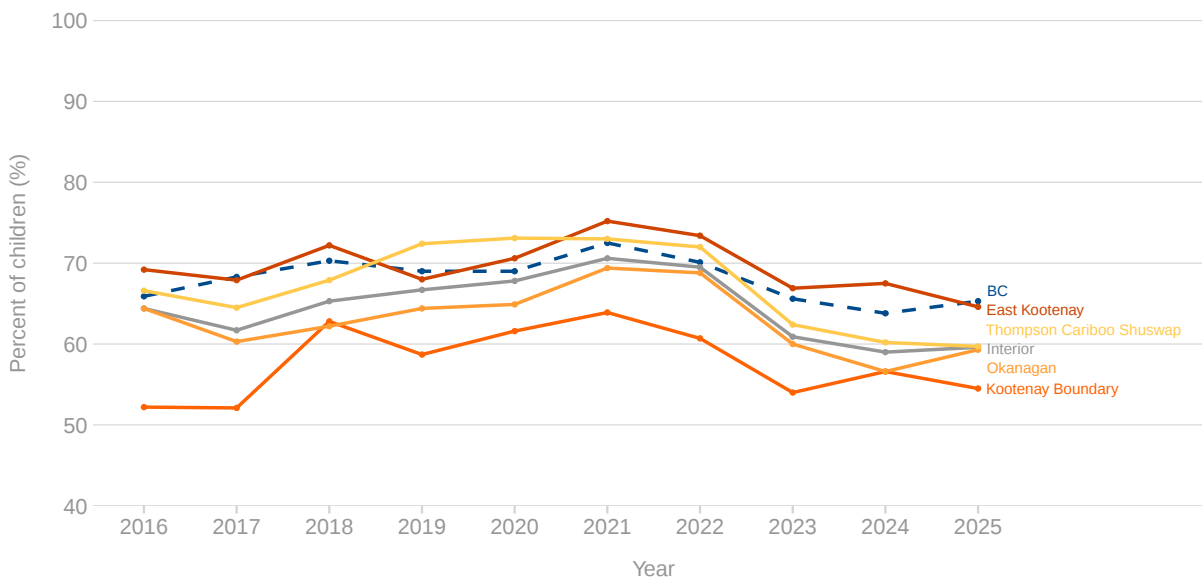


Note: The y-axis for this figure starts at 40% for clearer data visualization. Coverage estimates overlap for measles and mumps, and for DTaP, DTaP-IPV, and polio, and the individual antigens may be difficult to differentiate.

Figure 5. Antigen coverage by year and health authority, 7-year-olds, British Columbia

Interior Health

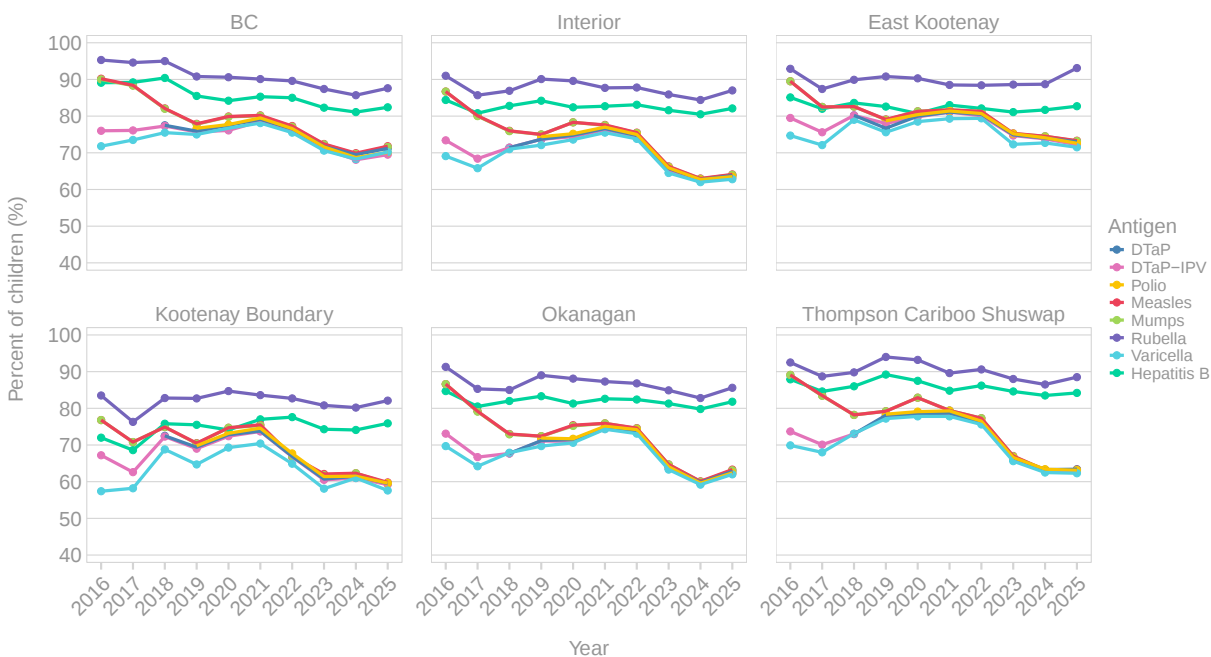
Up-to-date for age



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 6. Up-to-date for age by year and health service delivery area, 7-year-olds, Interior Health

Coverage by antigen

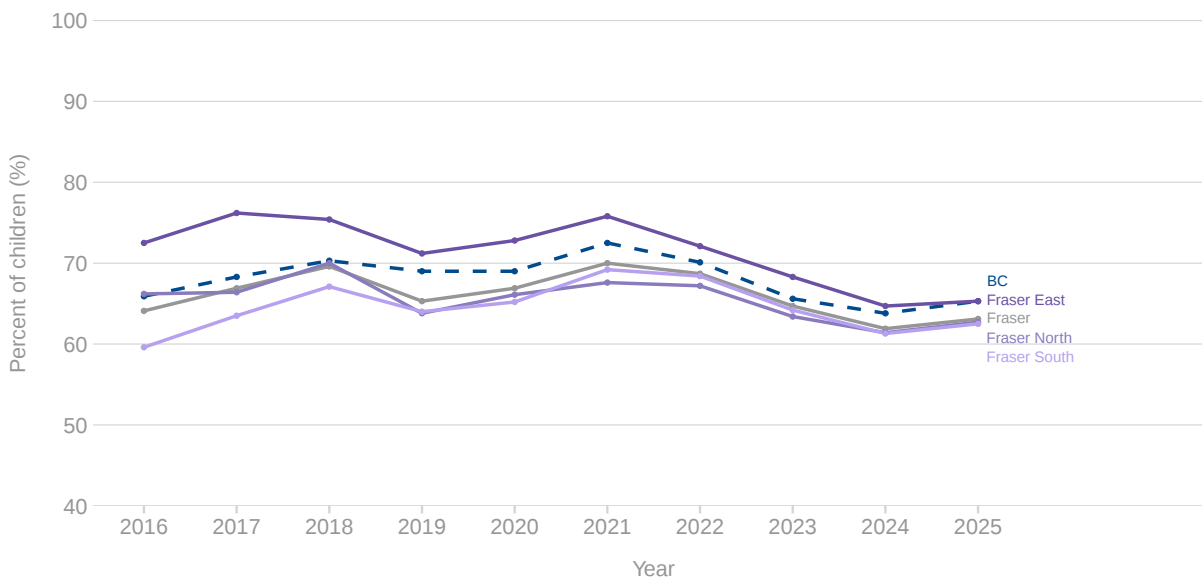


Note: The y-axis for this figure starts at 40% for clearer data visualization. Coverage estimates overlap for measles and mumps, and for DTaP, DTaP-IPV, and polio, and the individual antigens may be difficult to differentiate.

Figure 7. Antigen coverage by year and health service delivery area, 7-year-olds, Interior Health

Fraser Health

Up-to-date for age



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 8. Up-to-date for age by year and health service delivery area, 7-year-olds, Fraser Health

Coverage by antigen

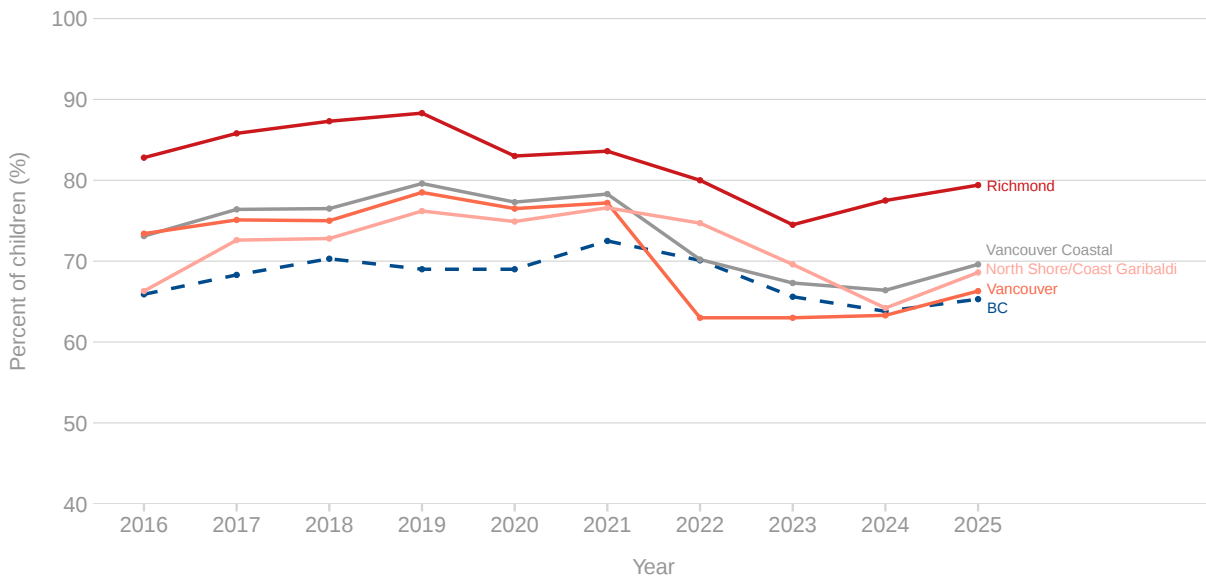


Note: The y-axis for this figure starts at 40% for clearer data visualization. Coverage estimates overlap for measles and mumps, and for DTaP, DTaP-IPV, and polio, and the individual antigens may be difficult to differentiate.

Figure 9. Antigen coverage by year and health service delivery area, 7-year-olds, Fraser Health

Vancouver Coastal Health

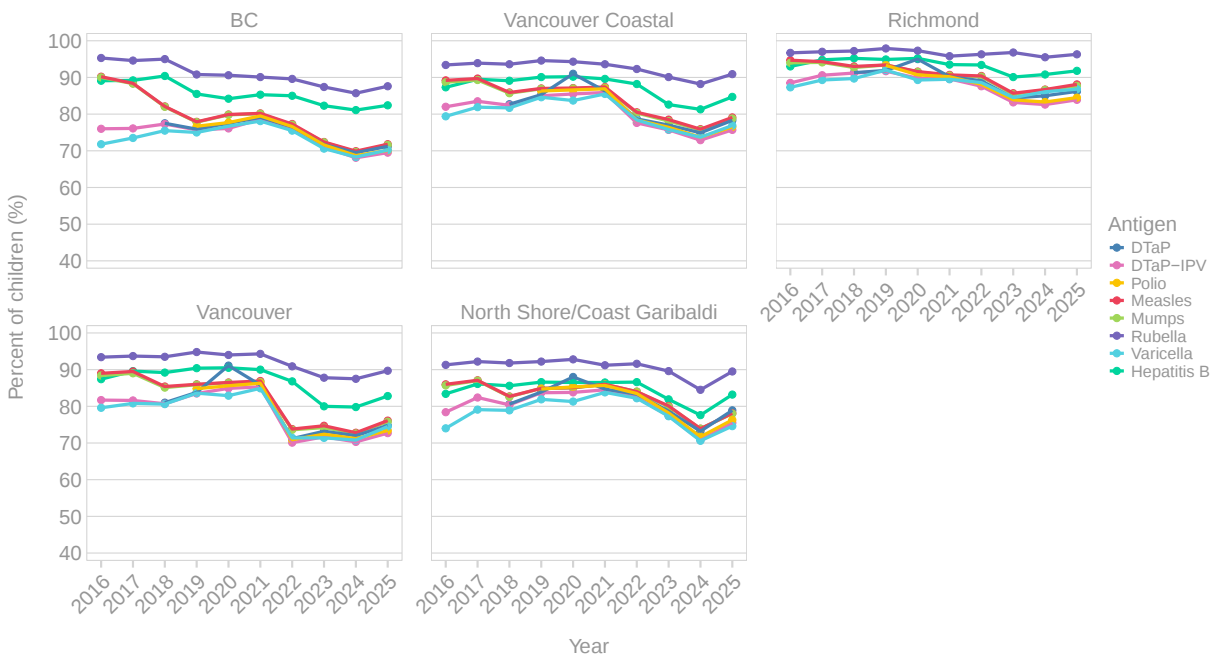
Up-to-date for age



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 10. Up-to-date for age by year and health service delivery area, 7-year-olds, Vancouver Coastal Health

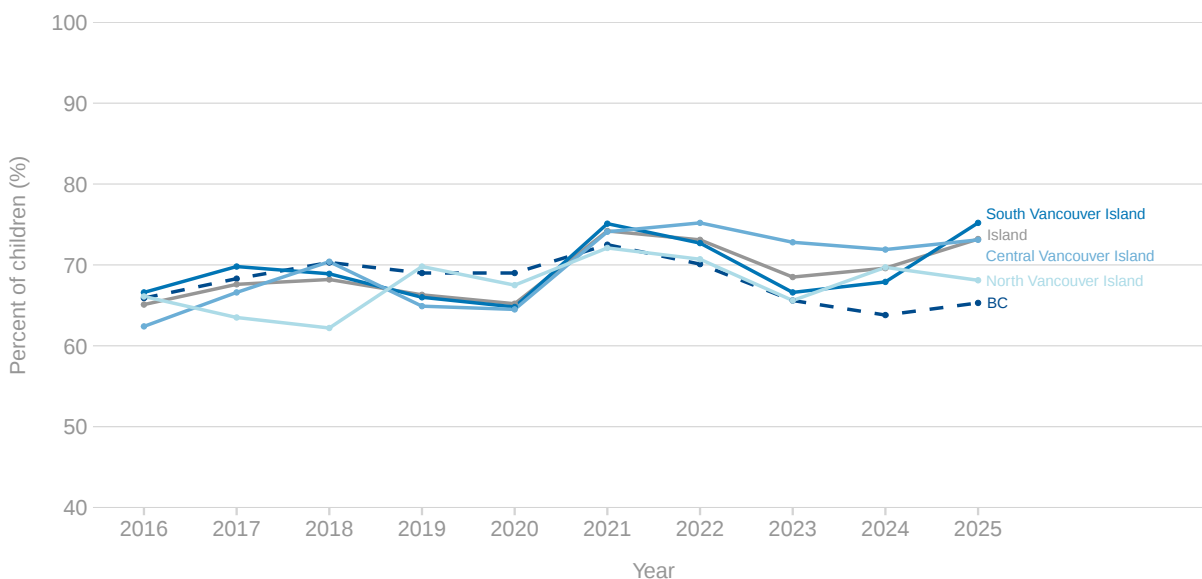
Coverage by antigen



Note: The y-axis for this figure starts at 40% for clearer data visualization. Coverage estimates overlap for measles and mumps, and for DTaP, DTaP-IPV, and polio, and the individual antigens may be difficult to differentiate.

Figure 11. Antigen coverage by year and health service delivery area, 7-year-olds, Vancouver Coastal Health

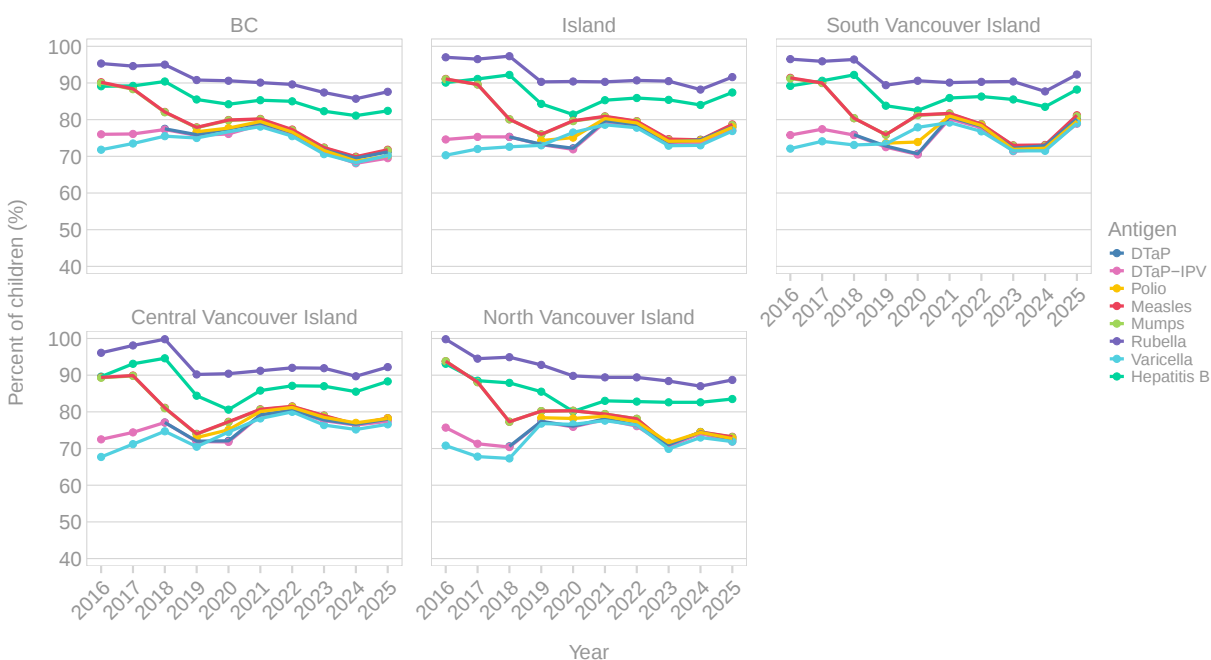
Island Health Up-to-date for age



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 12. Up-to-date for age by year and health service delivery area, 7-year-olds, Island Health

Coverage by antigen

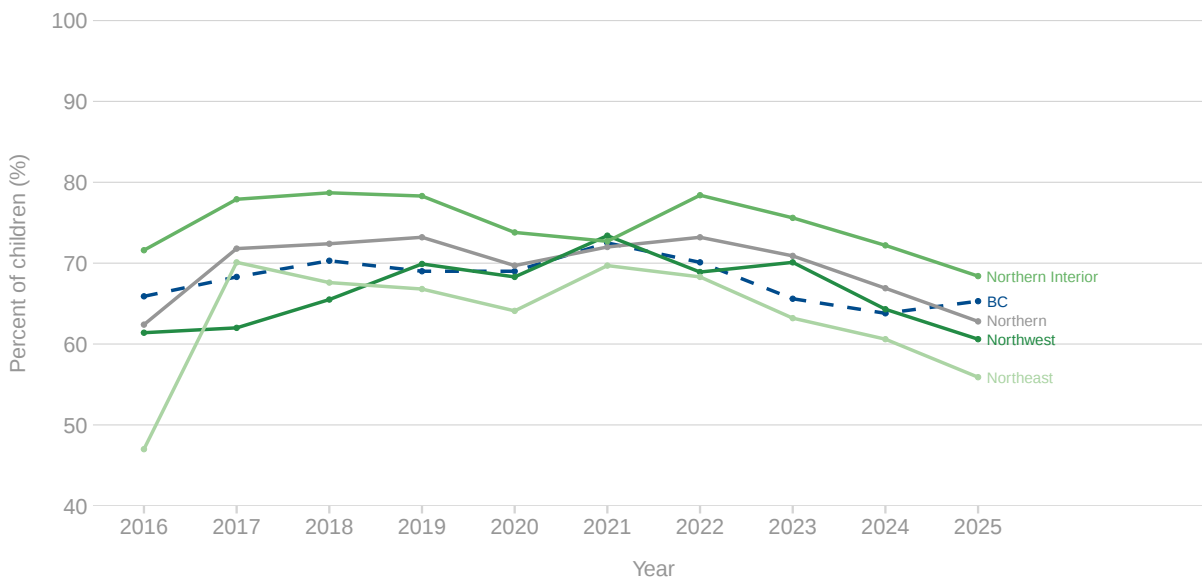


Note: The y-axis for this figure starts at 40% for clearer data visualization. Coverage estimates overlap for measles and mumps, and for DTaP, DTaP-IPV, and polio, and the individual antigens may be difficult to differentiate.

Figure 13. Antigen coverage by year and health service delivery area, 7-year-olds, Island Health

Northern Health

Up-to-date for age



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 14. Up-to-date for age by year and health service delivery area, 7-year-olds, Northern Health

Coverage by antigen



Note: The y-axis for this figure starts at 40% for clearer data visualization. Coverage estimates overlap for measles and mumps, and for DTaP, DTaP-IPV, and polio, and the individual antigens may be difficult to differentiate.

Figure 15. Antigen coverage by year and health service delivery area, 7-year-olds, Northern Health

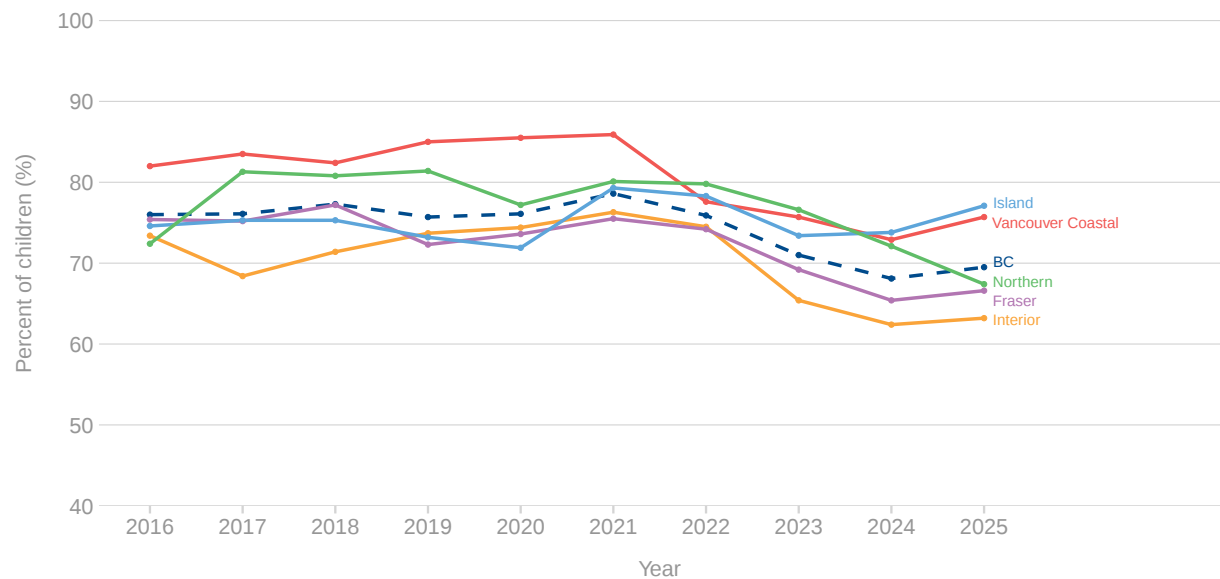
Immunization Coverage by Antigen

In the following coverage by antigen sections, the 'Unknown' subcategories of partially immunized and unimmunized includes all children who do not have a documented refusal, contraindication, or exemption for the antigen of interest and were therefore partially immunized or unimmunized for a reason not recorded.

The 'Unimmunized - Unknown' subcategory is further divided into two categories based on whether any immunization record exists. 'Immunization Record' includes children who have any record(s) (documented immunization, refusal, contraindication, and/or exemption) for other routine childhood immunizations, or who have records for the antigen/agent of interest that were not considered in the other categories (e.g. invalid doses, inactive contraindications, and/or inactive exemptions). 'No Immunization Record' includes children with no documented records for any of the assessed routine childhood immunizations. See reasons for non-immunization [definitions](#) for further information.

Diphtheria, Tetanus, Pertussis, and Polio (DTaP-IPV)

Immunization coverage



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 16. DTaP-IPV coverage by year and health authority, 7-year-olds, British Columbia

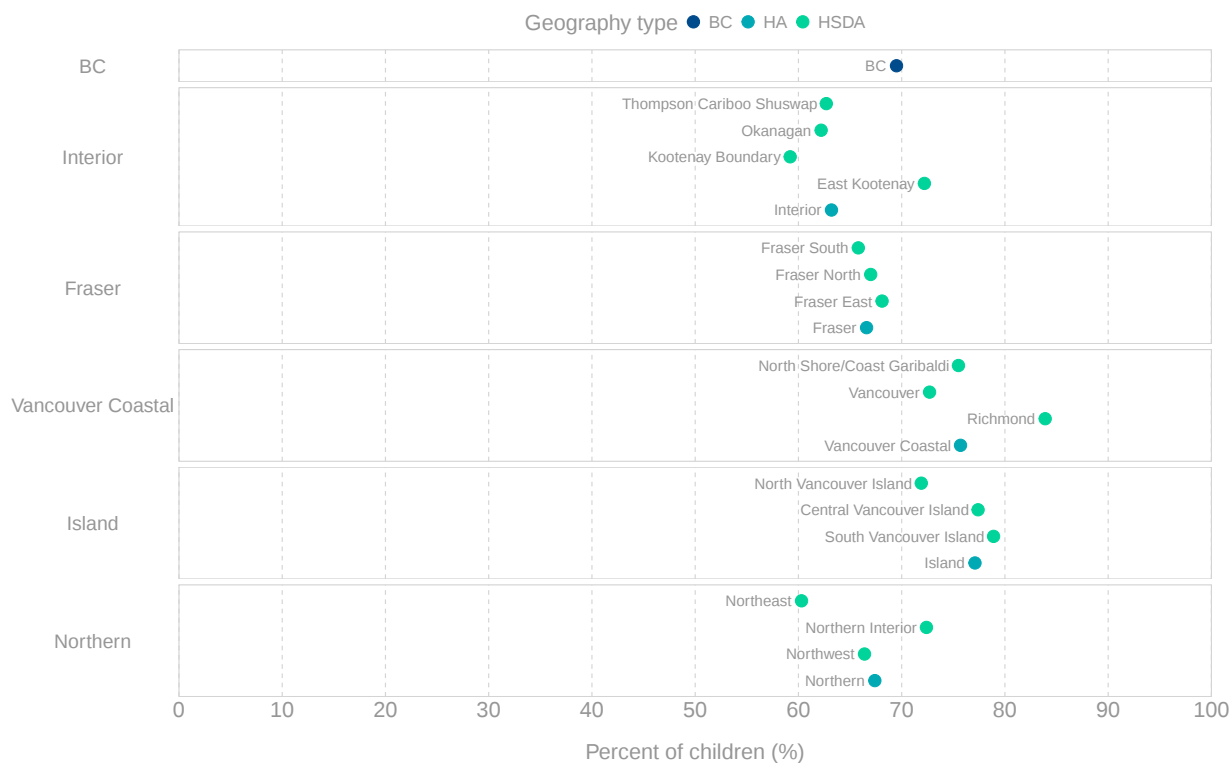
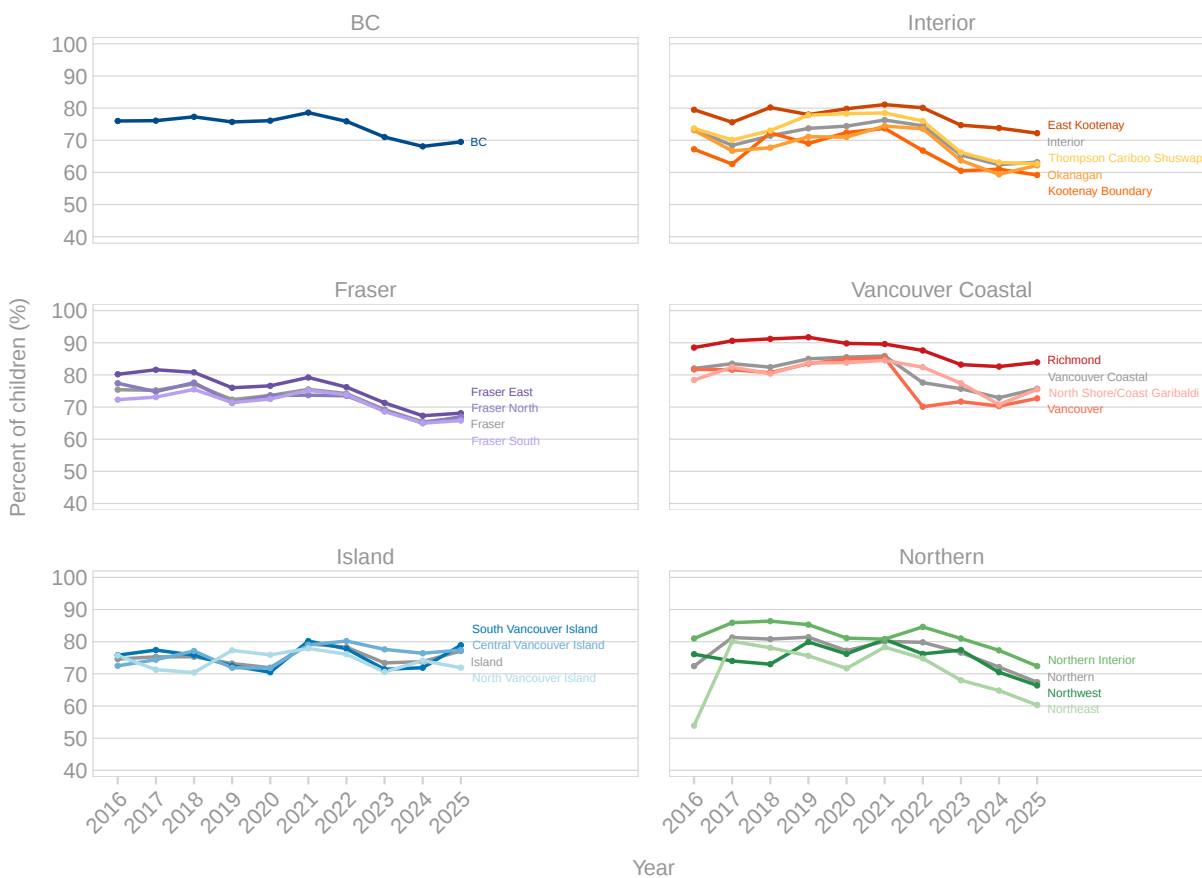


Figure 17. DTaP-IPV coverage by geographic region, 7-year-olds, British Columbia, 2025



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 18. DTaP-IPV coverage by year and geographic region, 7-year-olds, British Columbia

Diphtheria, Tetanus, Pertussis (DTaP)

Immunization coverage

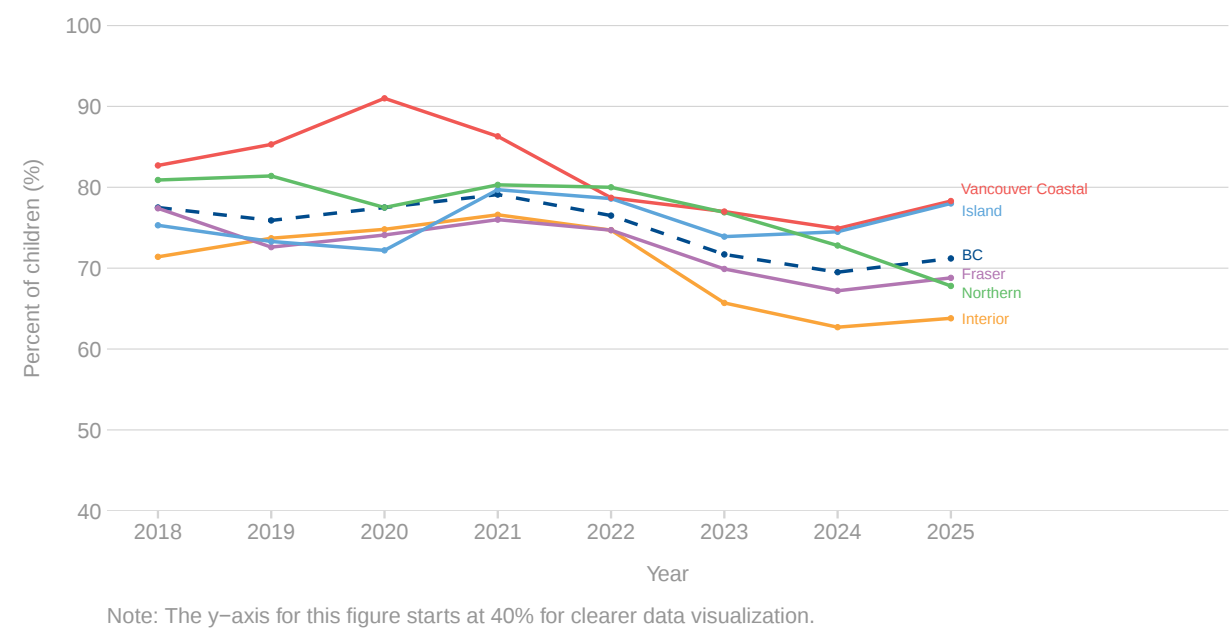


Figure 19. DTaP coverage by year and health authority, 7-year-olds, British Columbia

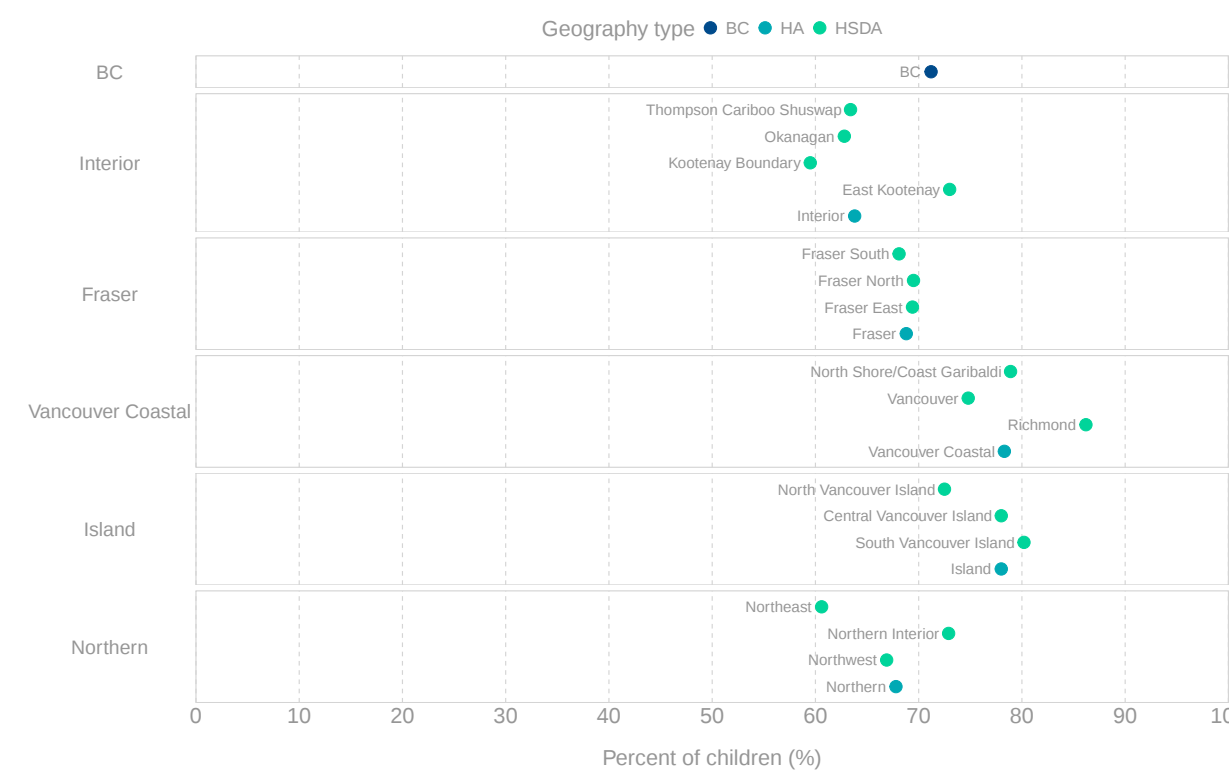
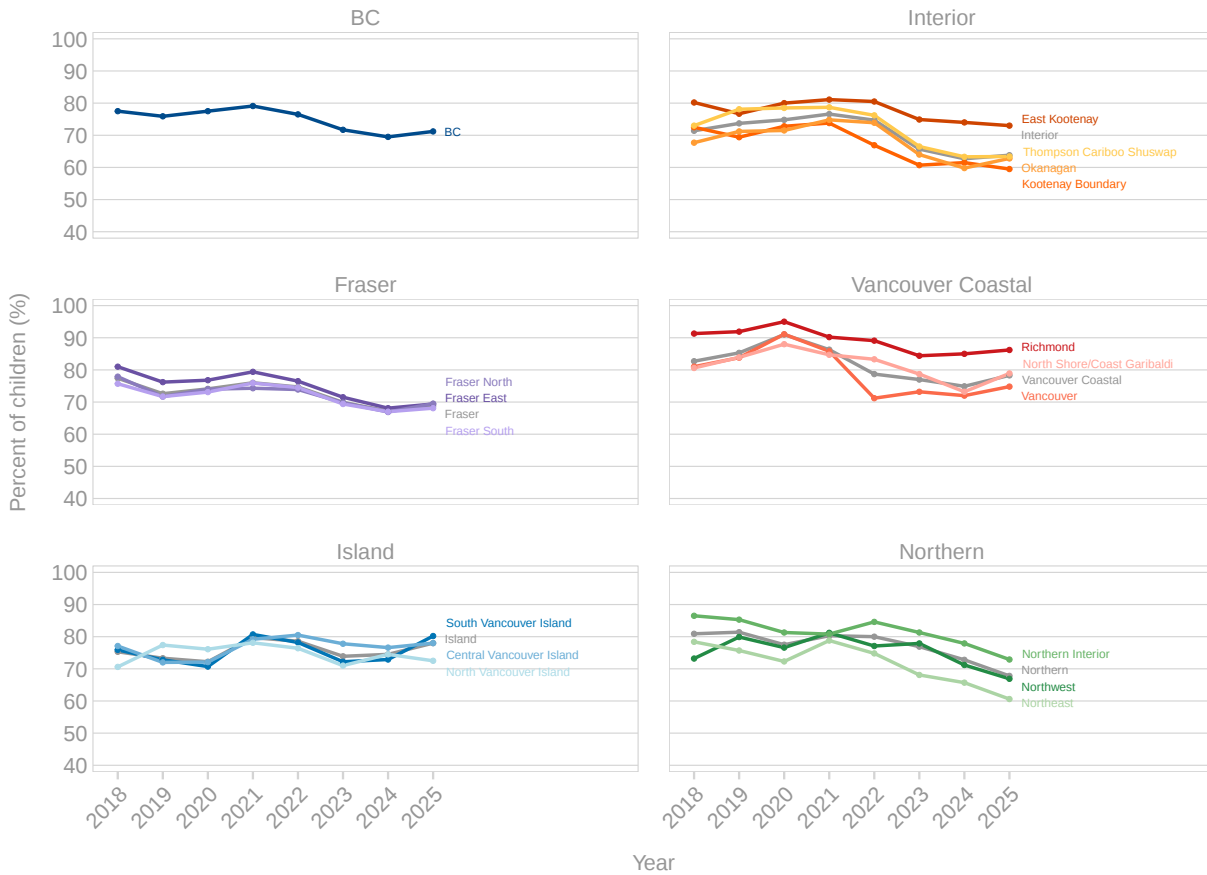


Figure 20. DTaP coverage by geographic region, 7-year-olds, British Columbia, 2025



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 21. DTaP coverage by year and geographic region, 7-year-olds, British Columbia

Reasons for non-immunization

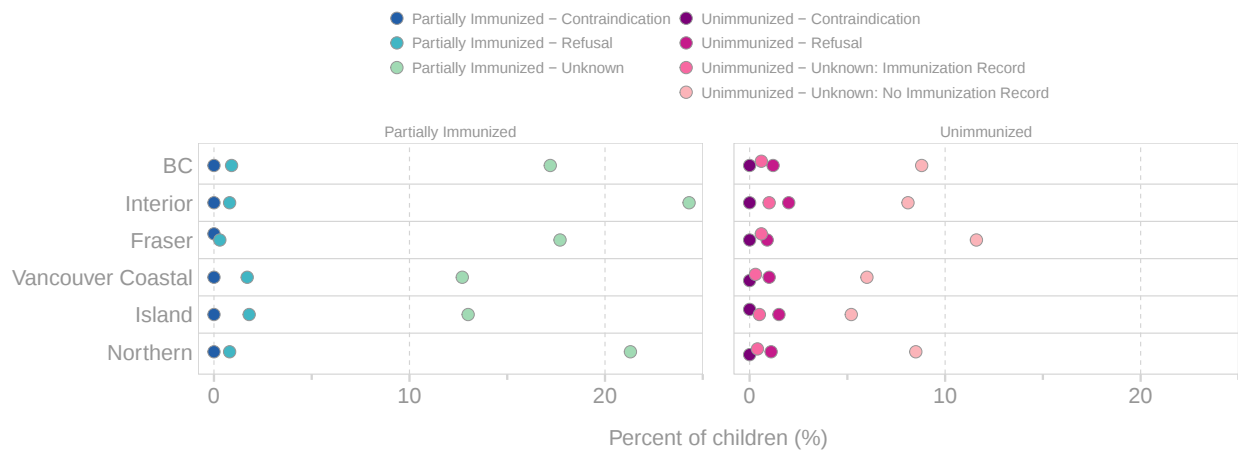


Figure 22. Reasons for non-immunization by health authority, DTaP, 7-year-olds, British Columbia, 2025

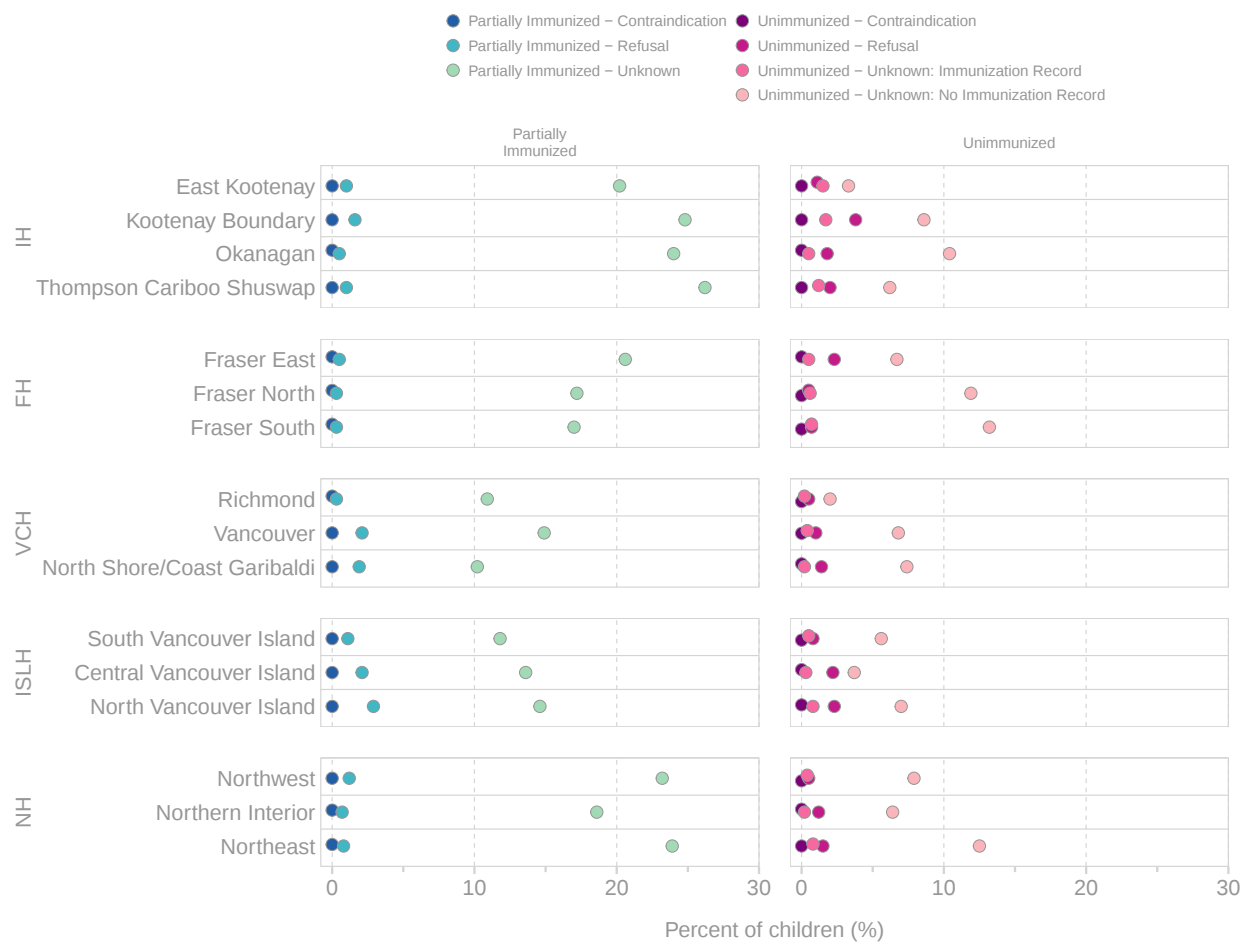


Figure 23. Reasons for non-immunization by health service delivery area, DTaP, 7-year-olds, British Columbia, 2025

Polio Immunization coverage

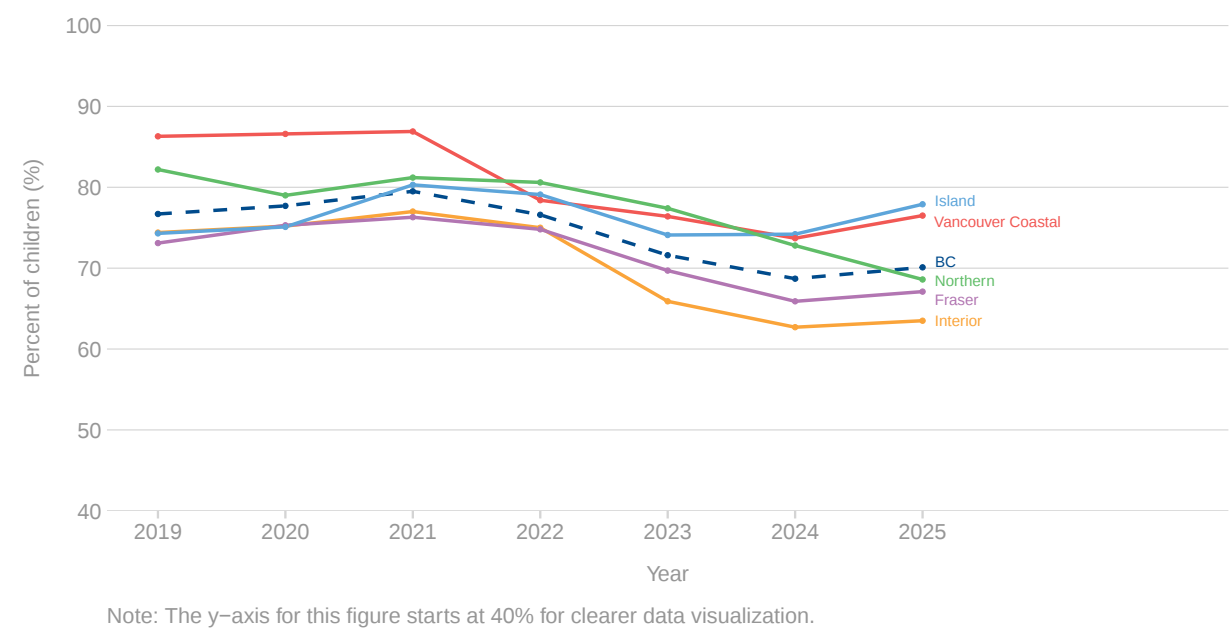


Figure 24. Polio coverage by year and health authority, 7-year-olds, British Columbia

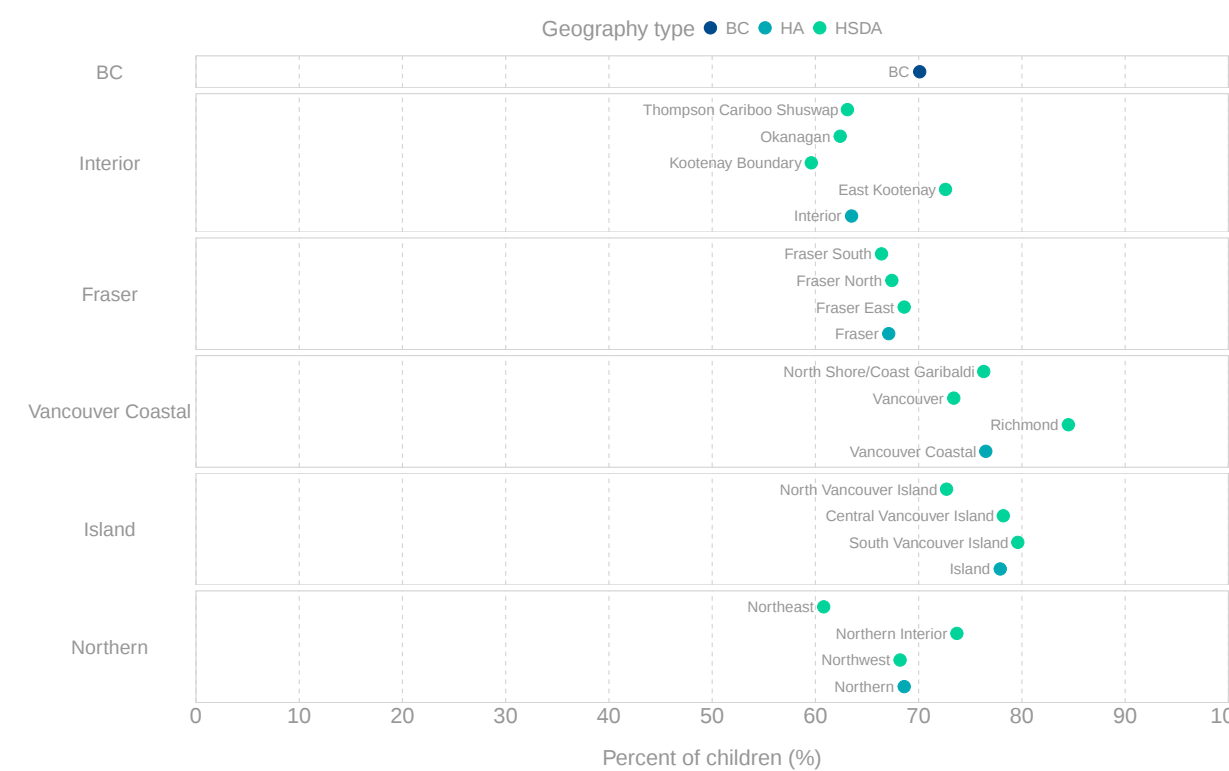


Figure 25. Polio coverage by geographic region, 7-year-olds, British Columbia, 2025



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 26. Polio coverage by year and geographic region, 7-year-olds, British Columbia

Reasons for non-immunization

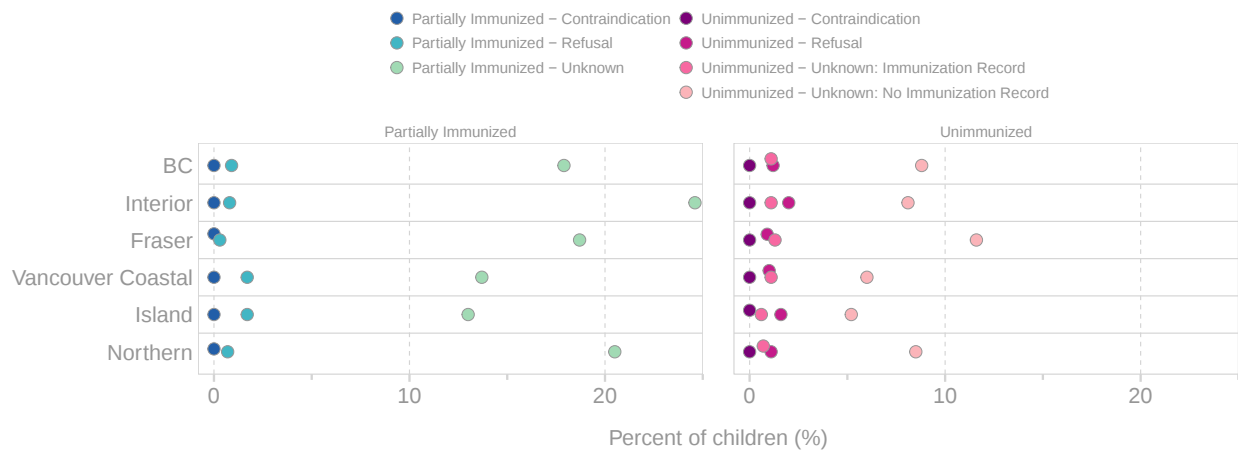


Figure 27. Reasons for non-immunization by health authority, Polio, 7-year-olds, British Columbia, 2025

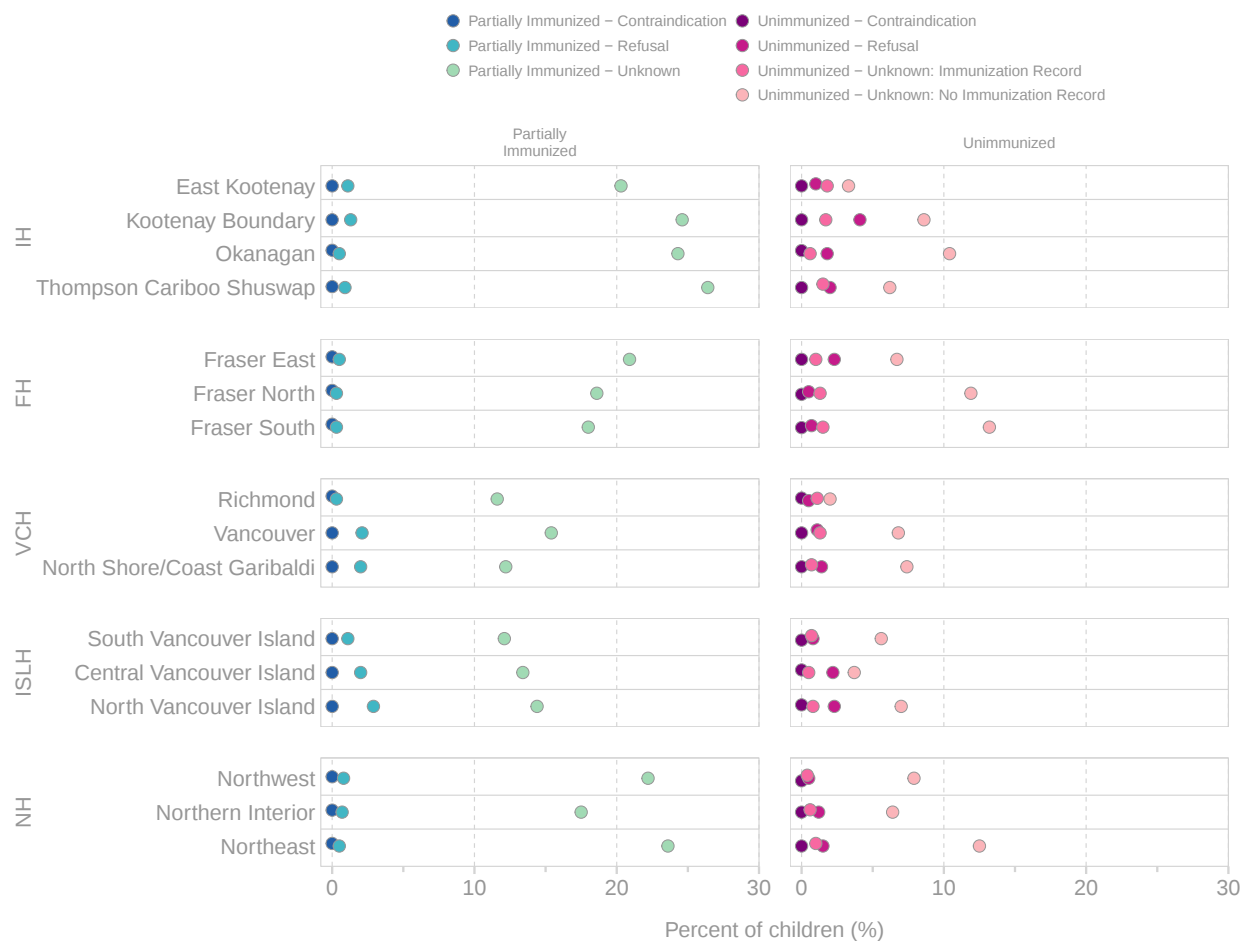


Figure 28. Reasons for non-immunization by health service delivery area, Polio, 7-year-olds, British Columbia, 2025

Measles

Immunization coverage

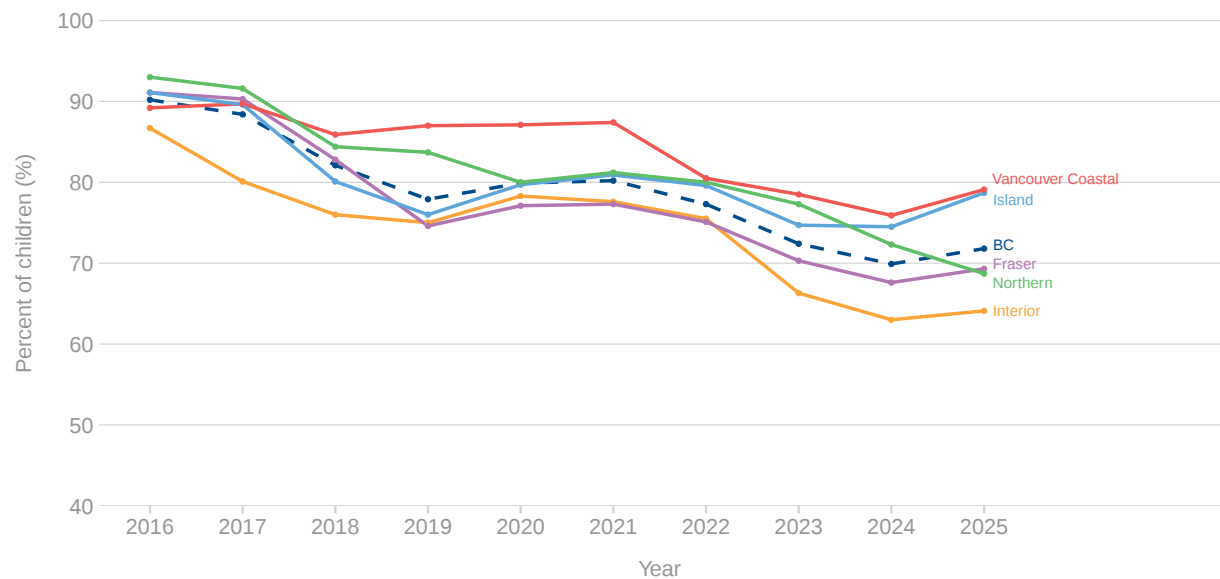


Figure 29. Measles coverage by year and health authority, 7-year-olds, British Columbia

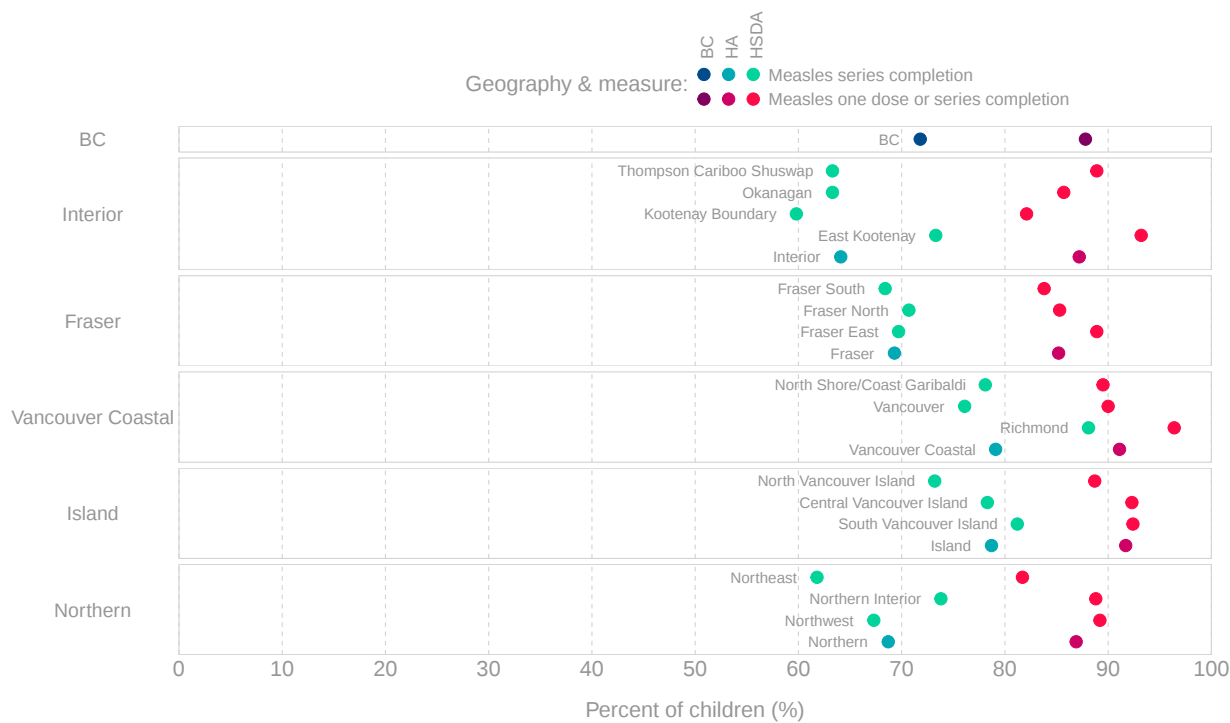
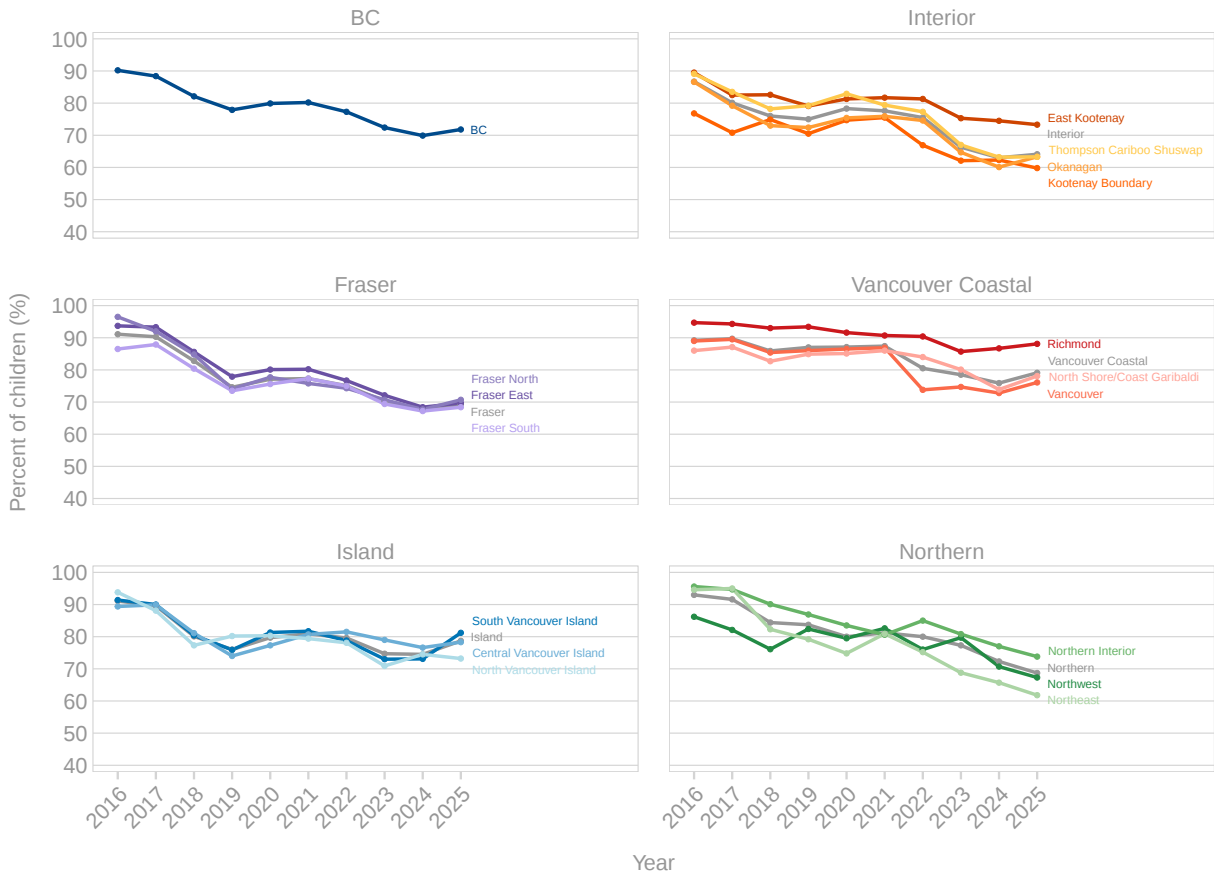


Figure 30. Measles one dose or series completion coverage by geographic region, 7-year-olds, British Columbia, 2025



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 31. Measles coverage by year and geographic region, 7-year-olds, British Columbia

Reasons for non-immunization

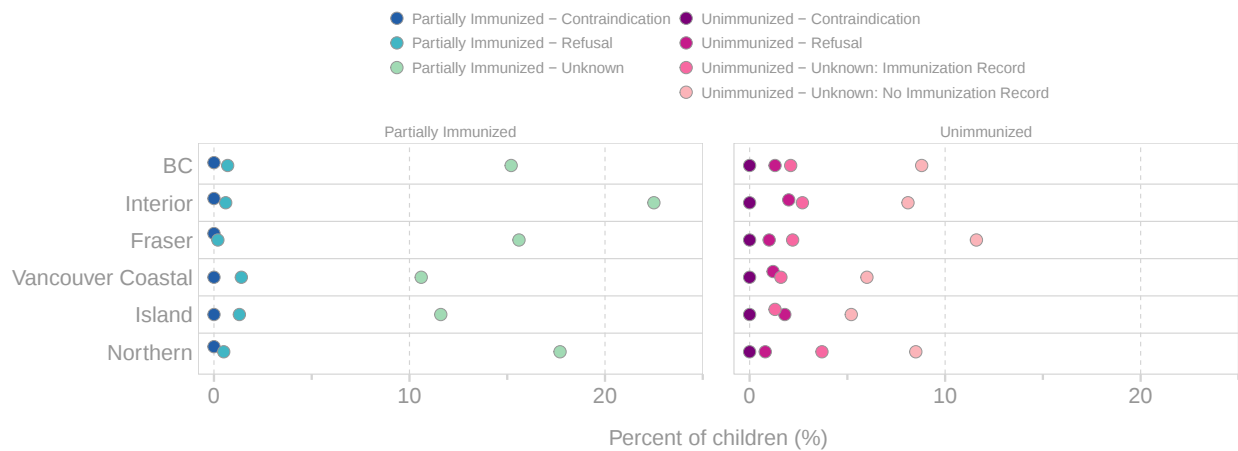


Figure 32. Reasons for non-immunization by health authority, Measles, 7-year-olds, British Columbia, 2025

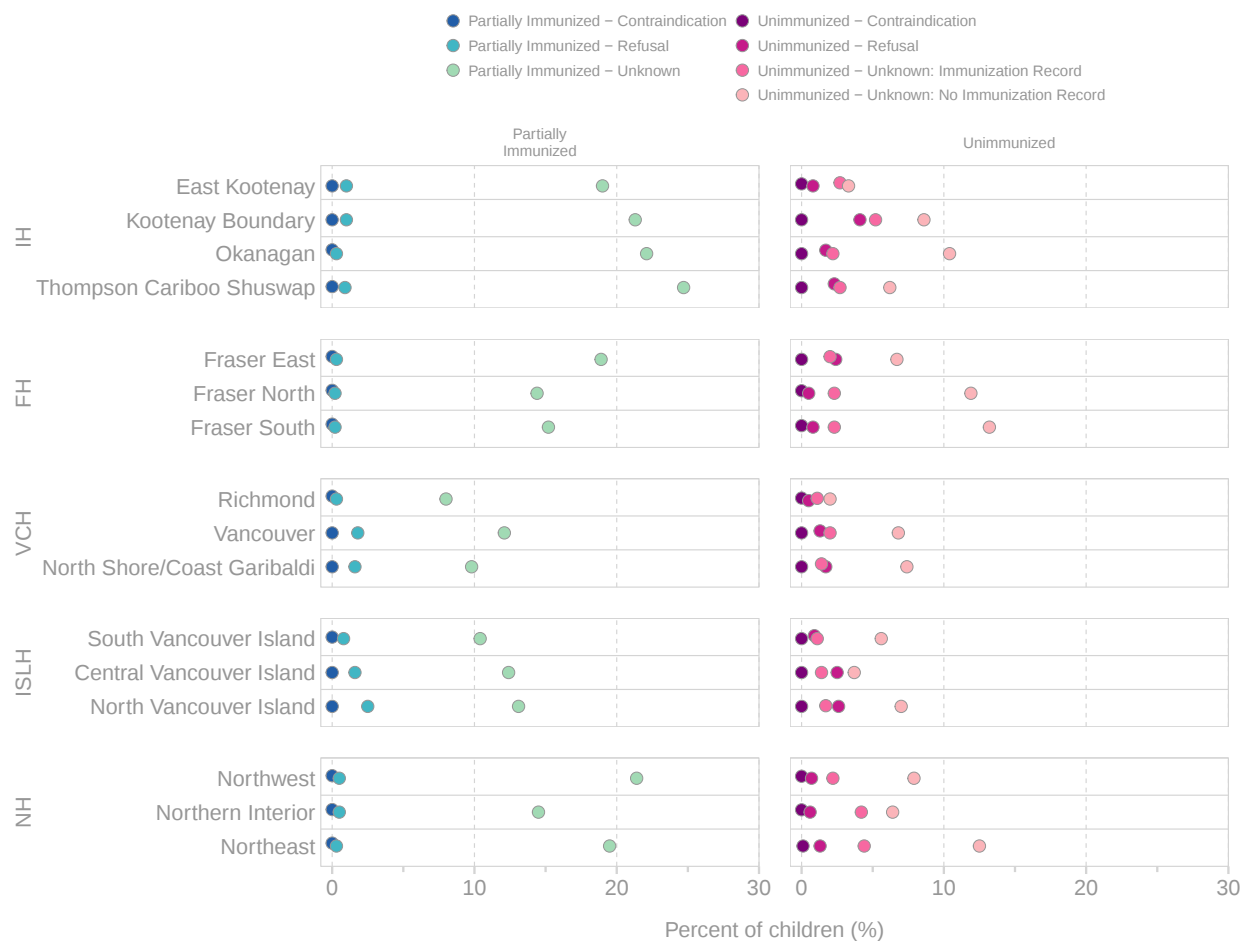


Figure 33. Reasons for non-immunization by health service delivery area, Measles, 7-year-olds, British Columbia, 2025

Mumps

Immunization coverage

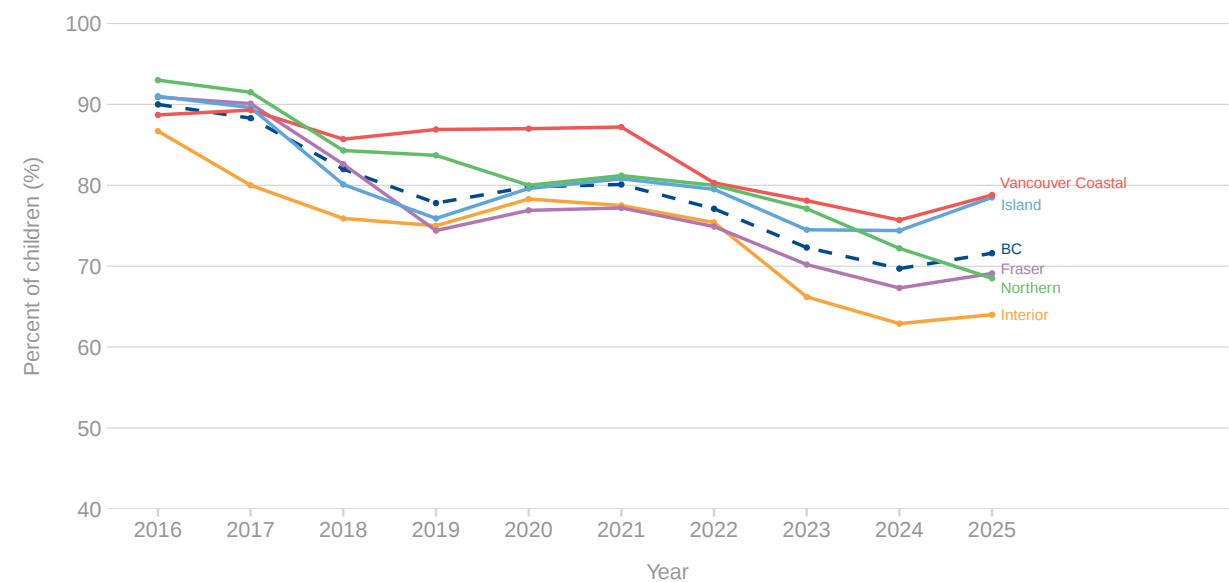


Figure 34. Mumps coverage by year and health authority, 7-year-olds, British Columbia

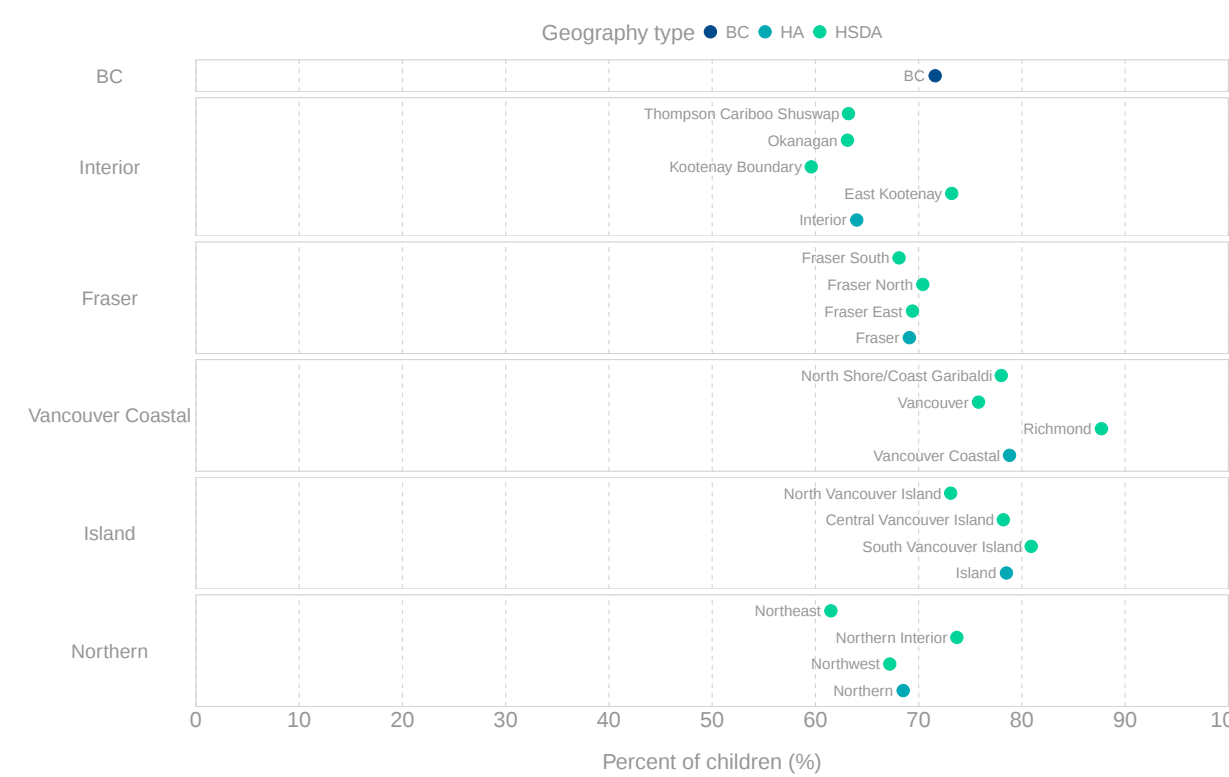


Figure 35. Mumps coverage by geographic region, 7-year-olds, British Columbia, 2025



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 36. Mumps coverage by year and geographic region, 7-year-olds, British Columbia

Reasons for non-immunization

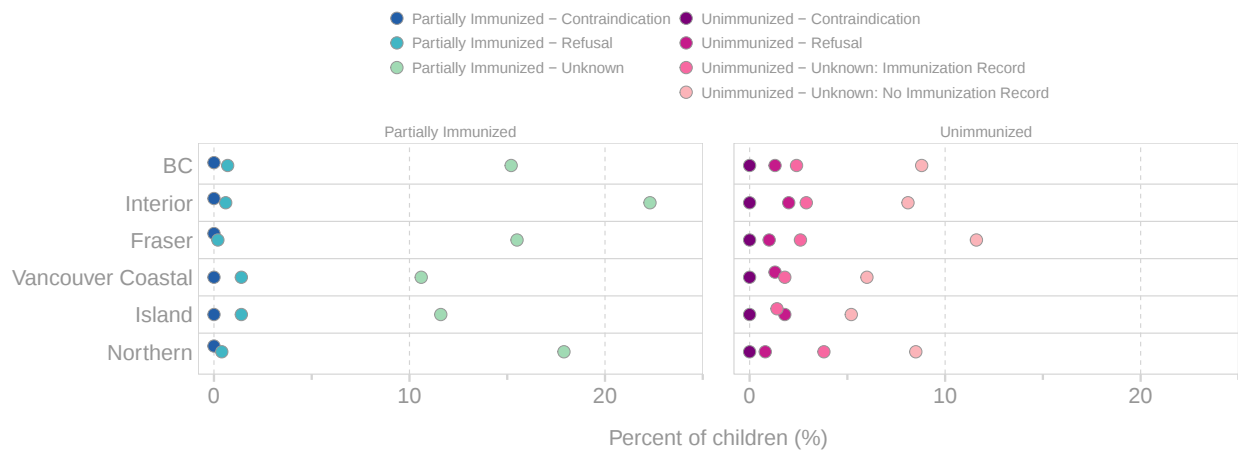


Figure 37. Reasons for non-immunization by health authority, Mumps, 7-year-olds, British Columbia, 2025

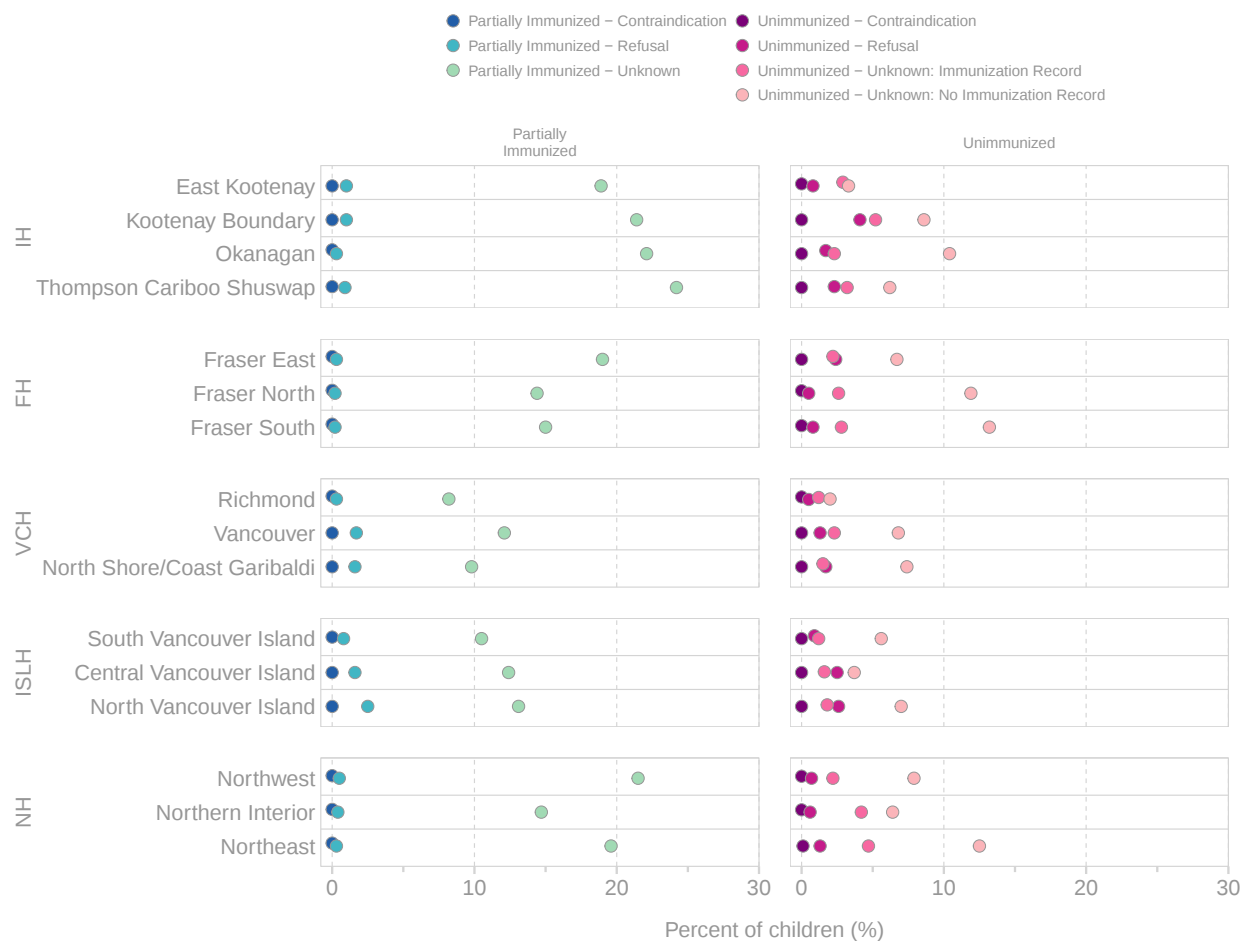
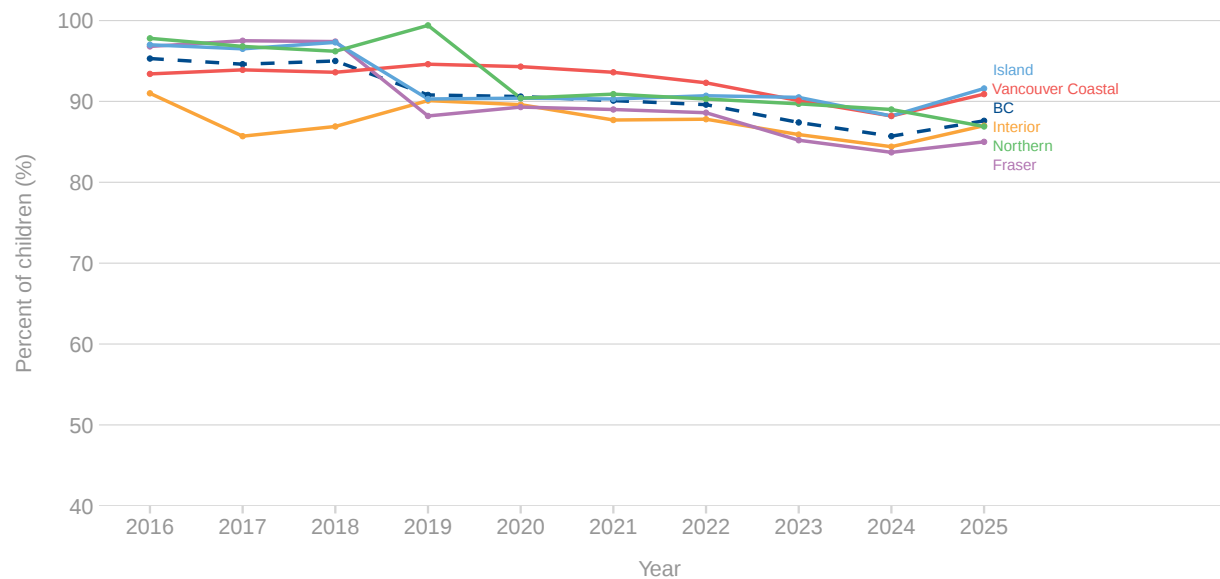


Figure 38. Reasons for non-immunization by health service delivery area, Mumps, 7-year-olds, British Columbia, 2025

Rubella

Immunization coverage



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 39. Rubella coverage by year and health authority, 7-year-olds, British Columbia

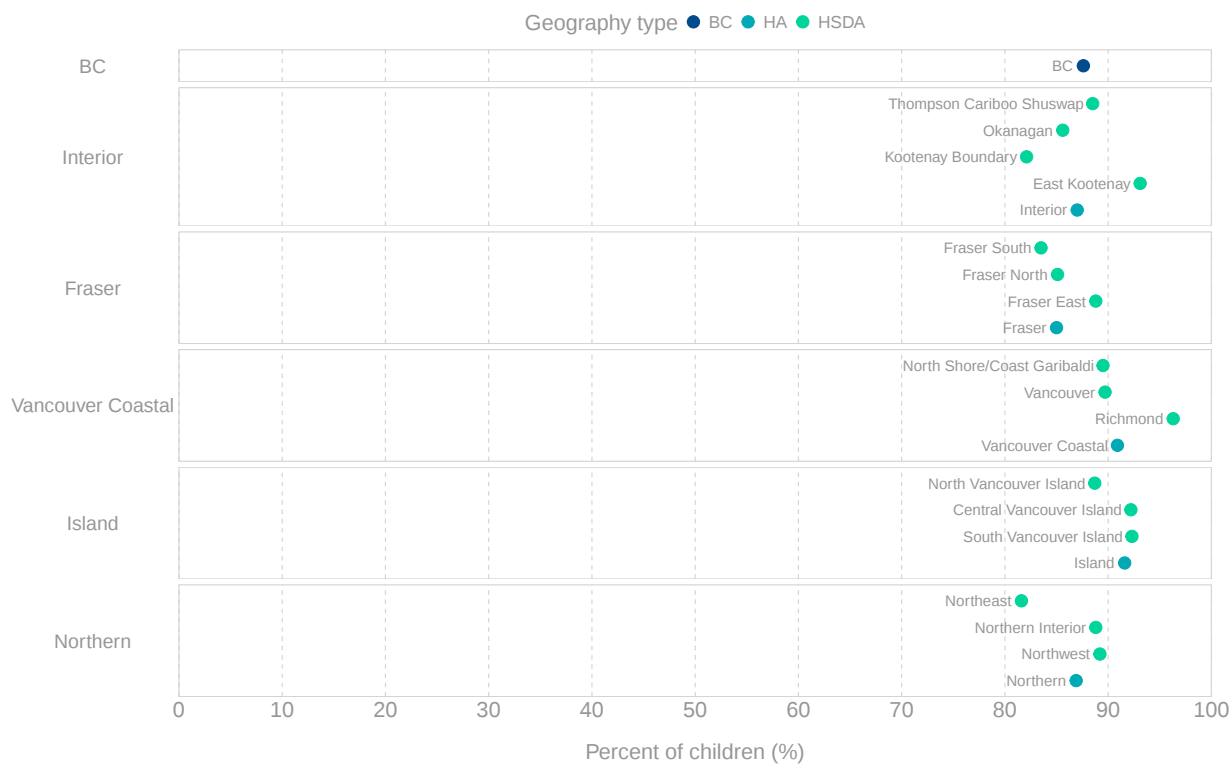
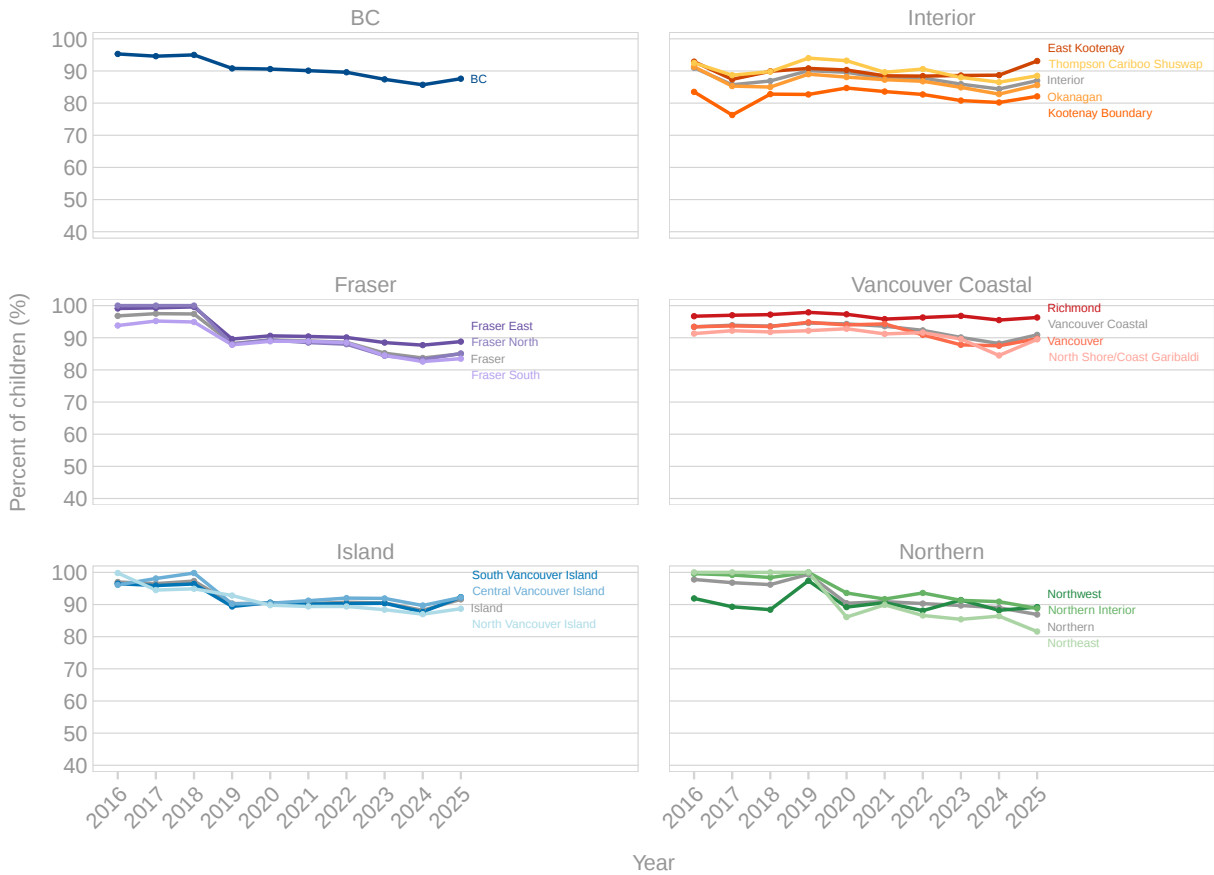


Figure 40. Rubella coverage by geographic region, 7-year-olds, British Columbia, 2025



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 41. Rubella coverage by year and geographic region, 7-year-olds, British Columbia

Reasons for non-immunization

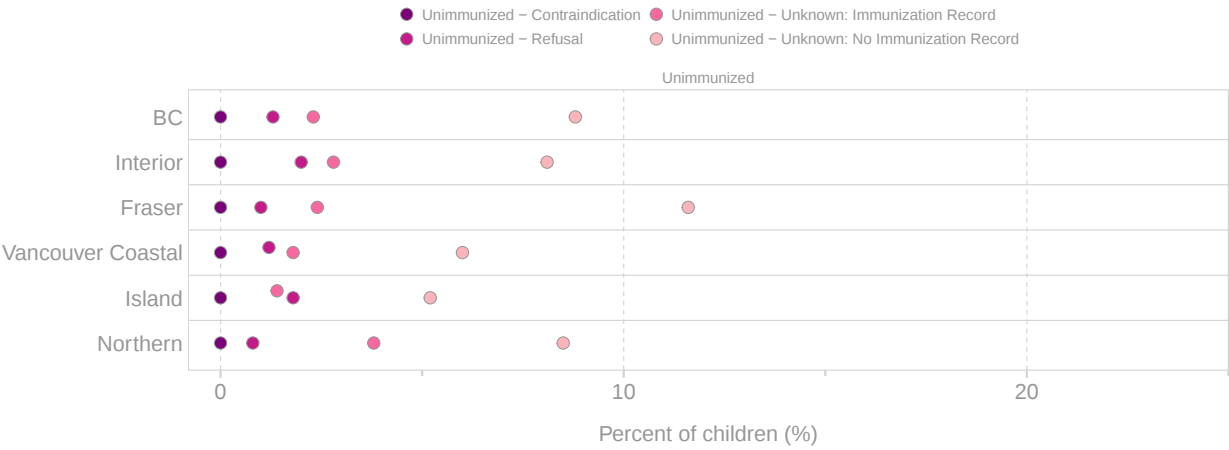


Figure 42. Reasons for non-immunization by health authority, Rubella, 7-year-olds, British Columbia, 2025

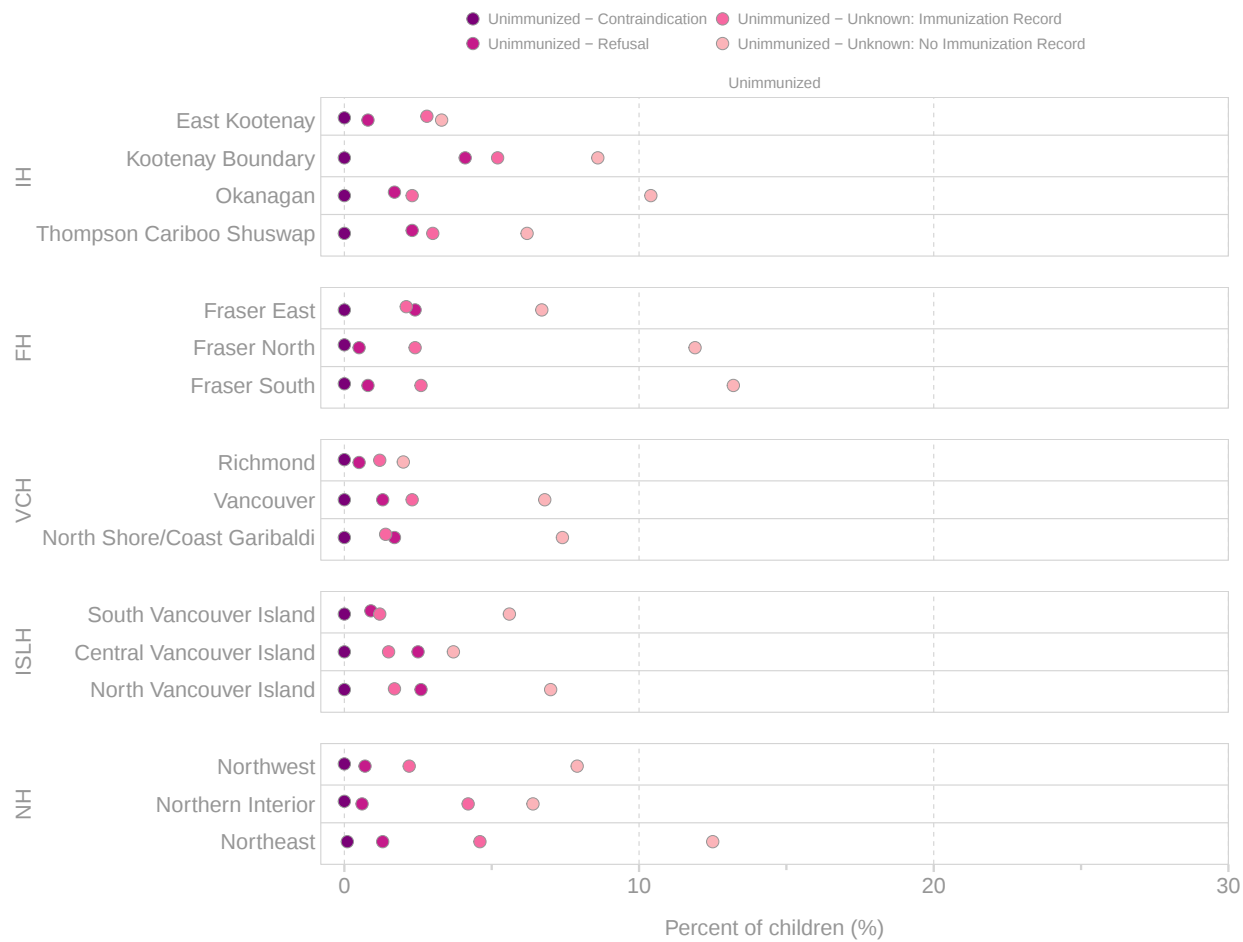
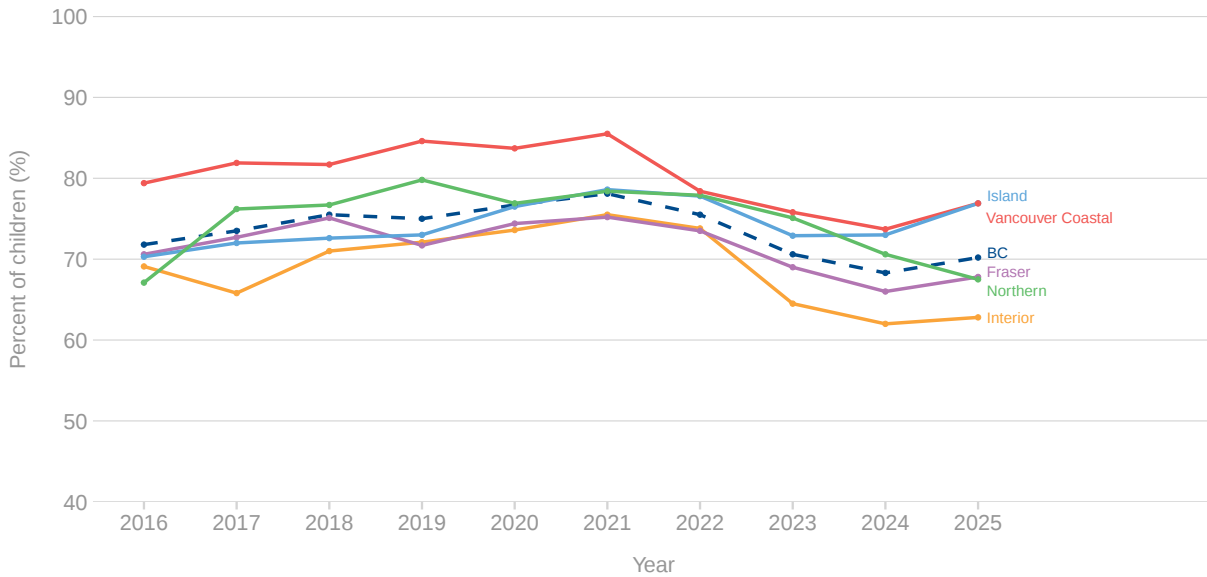


Figure 43. Reasons for non-immunization by health service delivery area, Rubella, 7-year-olds, British Columbia, 2025

Varicella

Immunization coverage



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 44. Varicella coverage by year and health authority, 7-year-olds, British Columbia

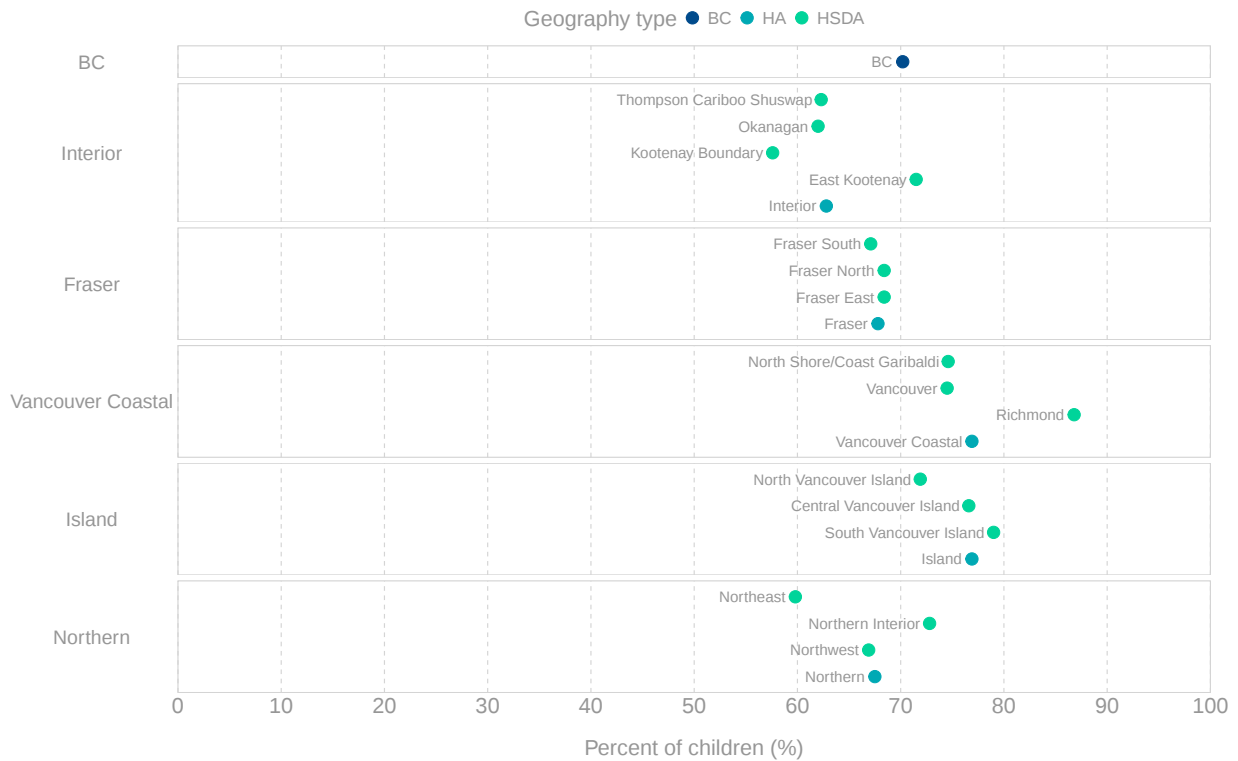
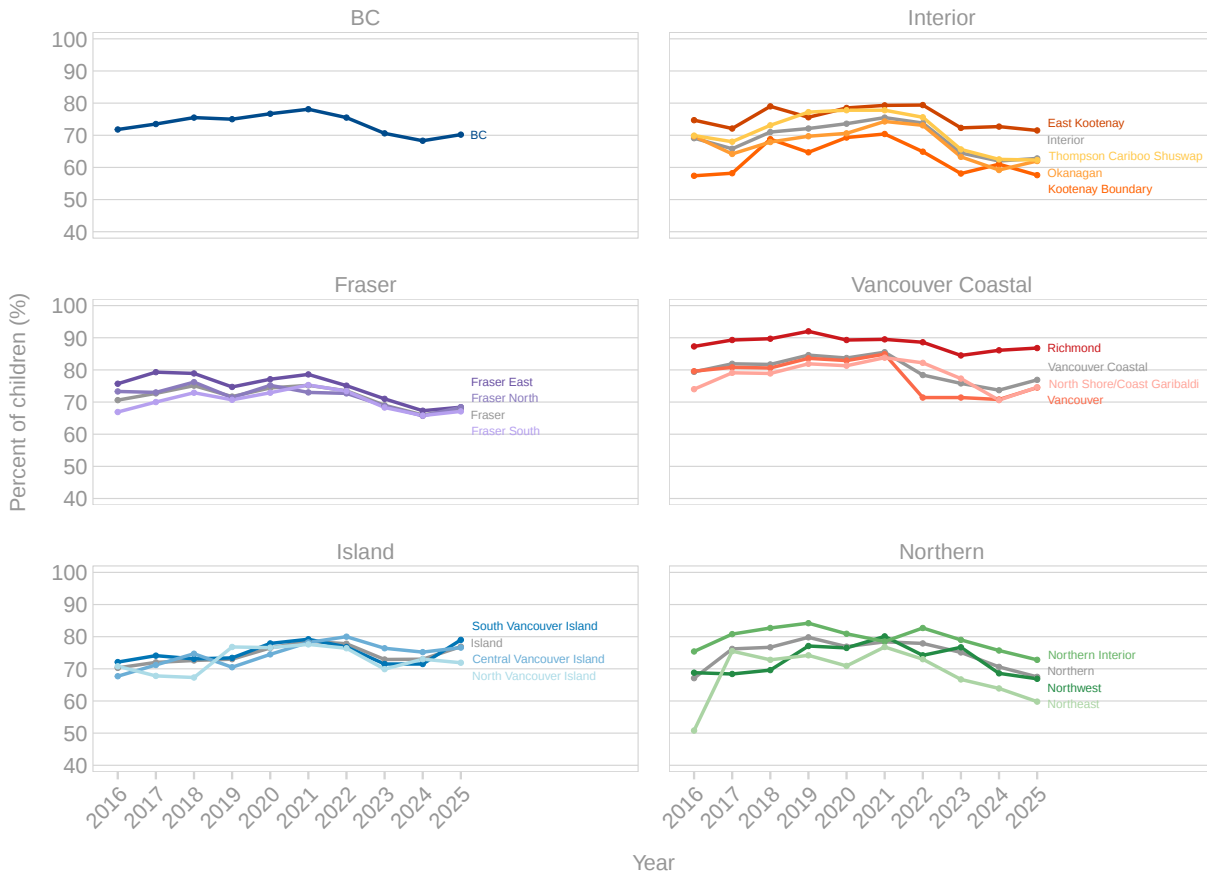


Figure 45. Varicella coverage by geographic region, 7-year-olds, British Columbia, 2025



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 46. Varicella coverage by year and geographic region, 7-year-olds, British Columbia

Reasons for non-immunization

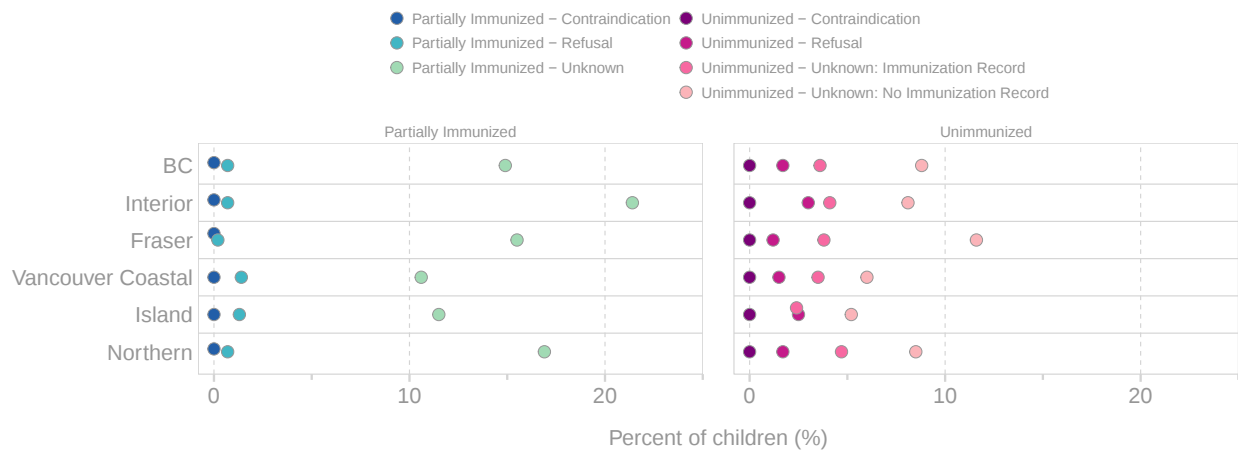


Figure 47. Reasons for non-immunization by health authority, Varicella, 7-year-olds, British Columbia, 2025

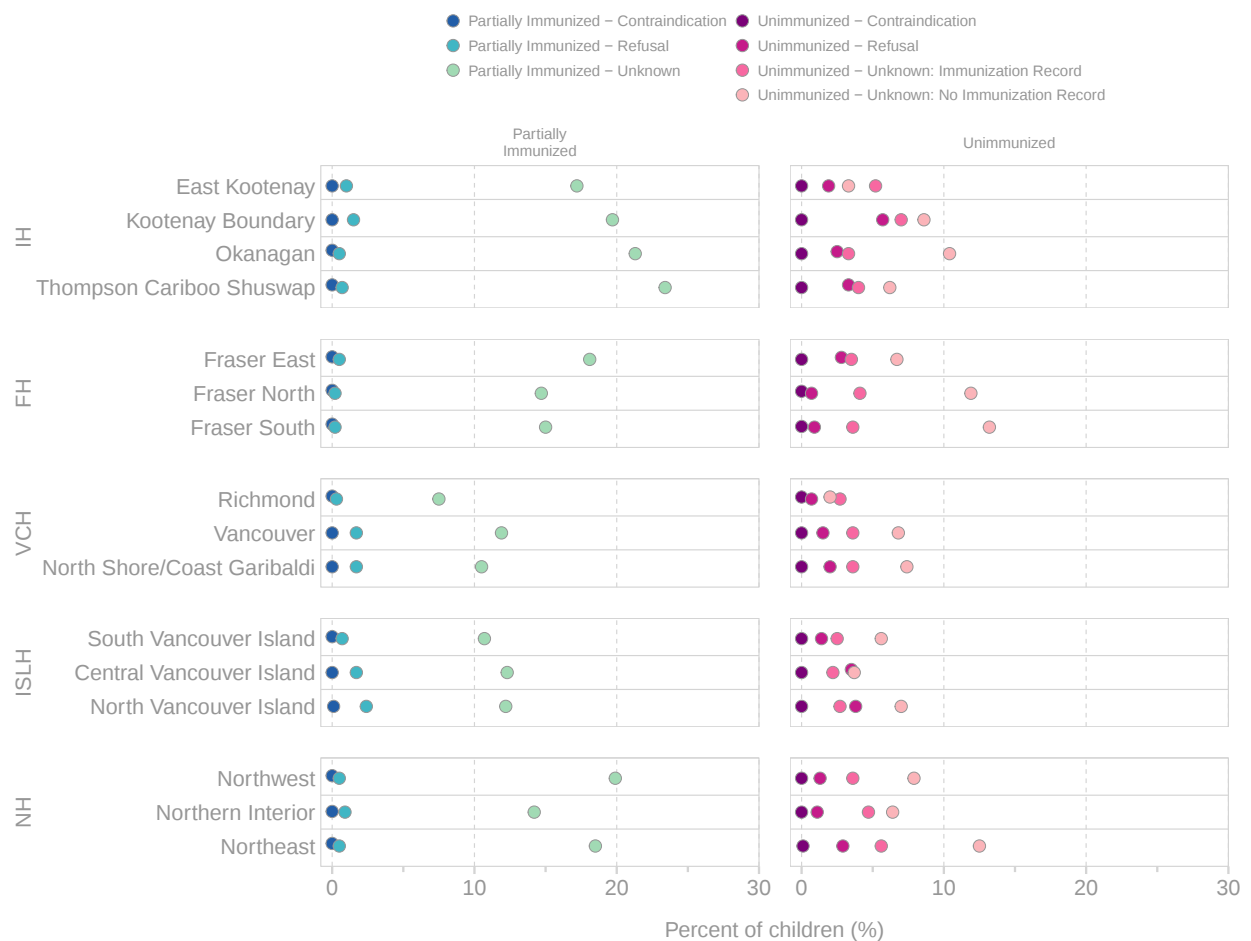
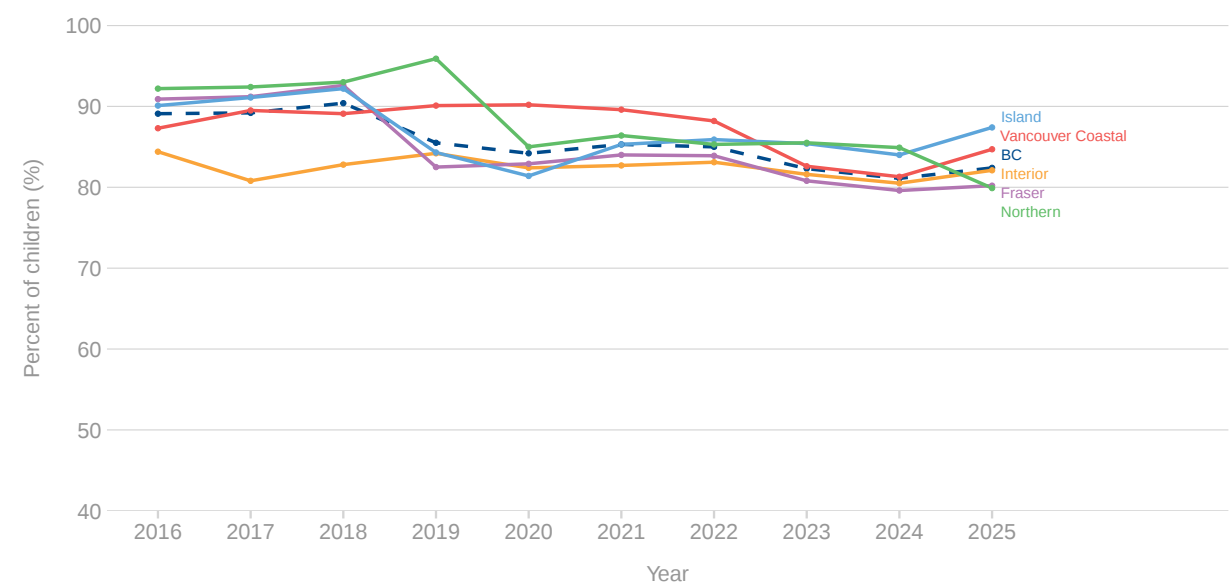


Figure 48. Reasons for non-immunization by health service delivery area, Varicella, 7-year-olds, British Columbia, 2025

Hepatitis B

Immunization coverage



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 49. Hepatitis B coverage by year and health authority, 7-year-olds, British Columbia

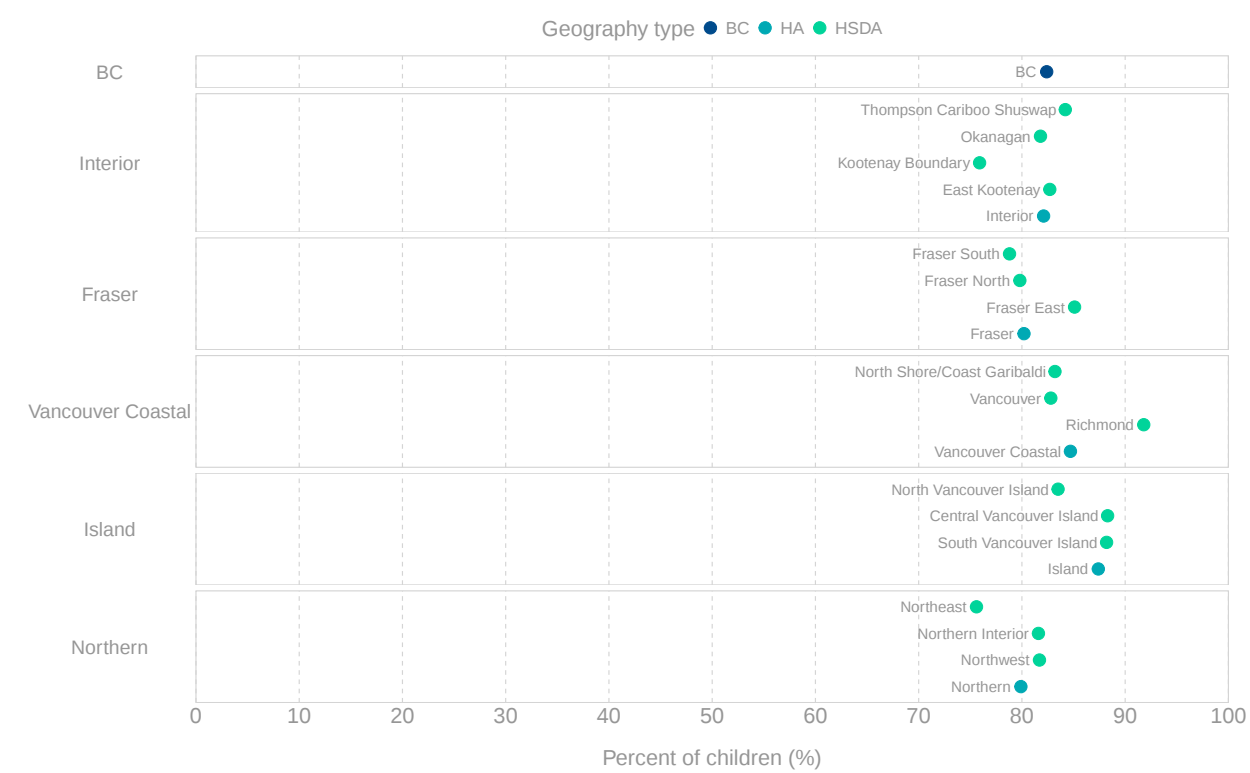


Figure 50. Hepatitis B coverage by geographic region, 7-year-olds, British Columbia, 2025



Note: The y-axis for this figure starts at 40% for clearer data visualization.

Figure 51. Hepatitis B coverage by year and geographic region, 7-year-olds, British Columbia

Reasons for non-immunization

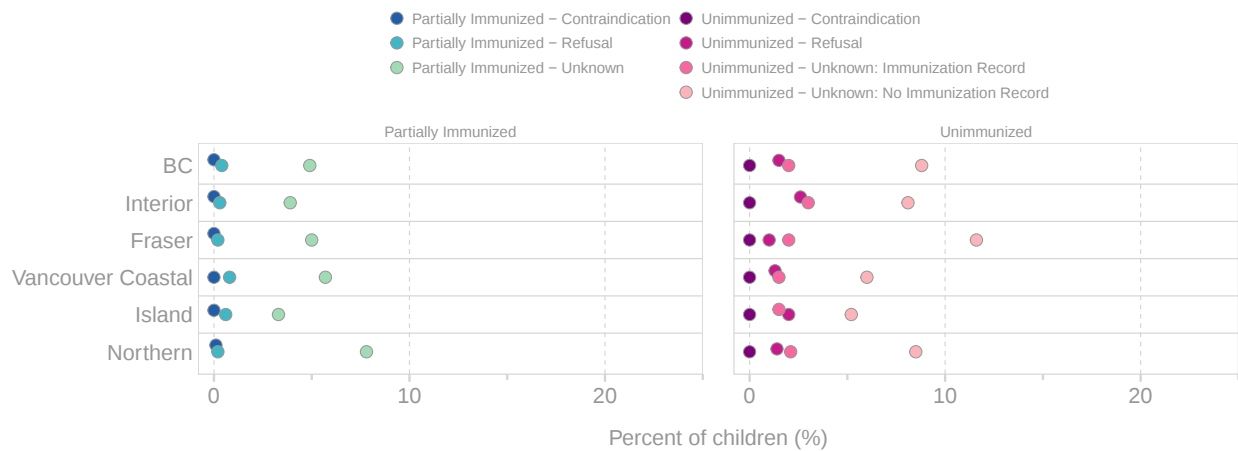


Figure 52. Reasons for non-immunization by health authority, Hepatitis B, 7-year-olds, British Columbia, 2025



Figure 53. Reasons for non-immunization by health service delivery area, Hepatitis B, 7-year-olds, British Columbia, 2025

Vaccine Refusals

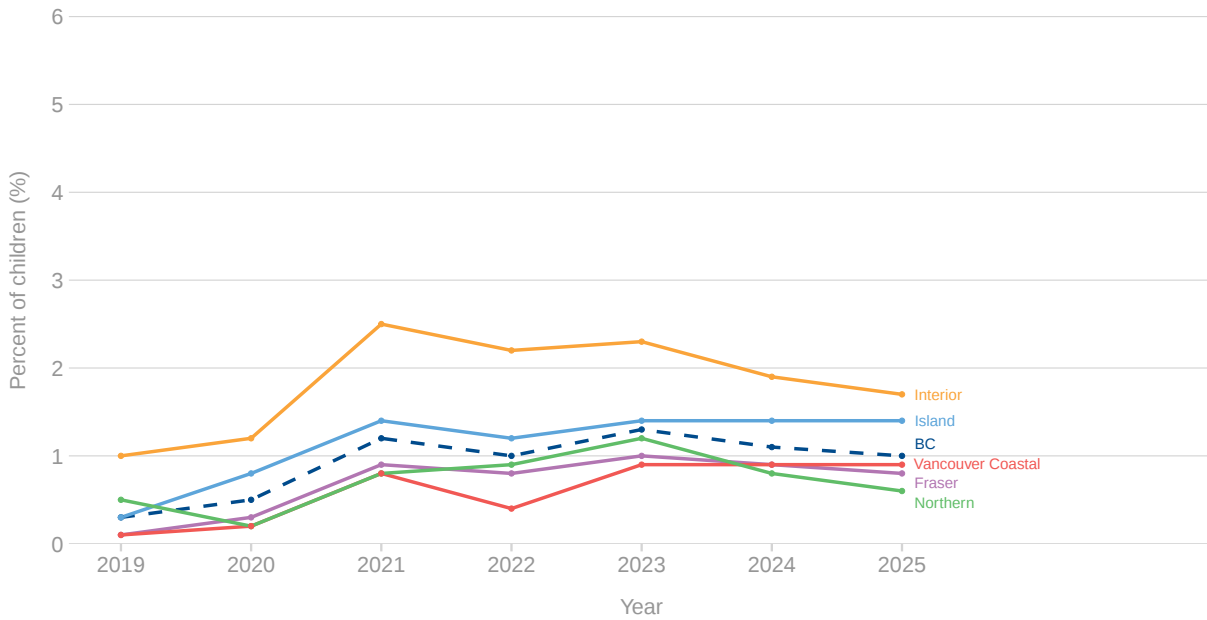


Figure 54. Refusal to all vaccines by year and health authority, 7-year-olds, British Columbia

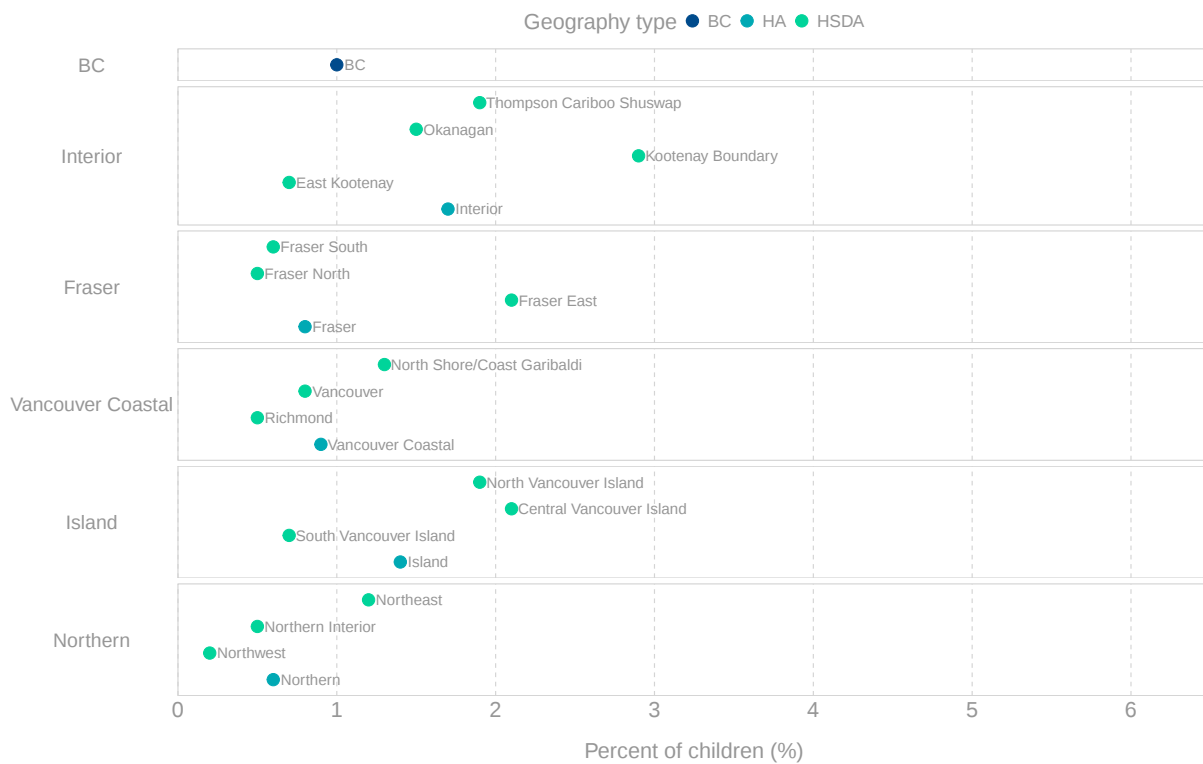


Figure 55. Refusal to all vaccines by geographic region, 7-year-olds, British Columbia, 2025

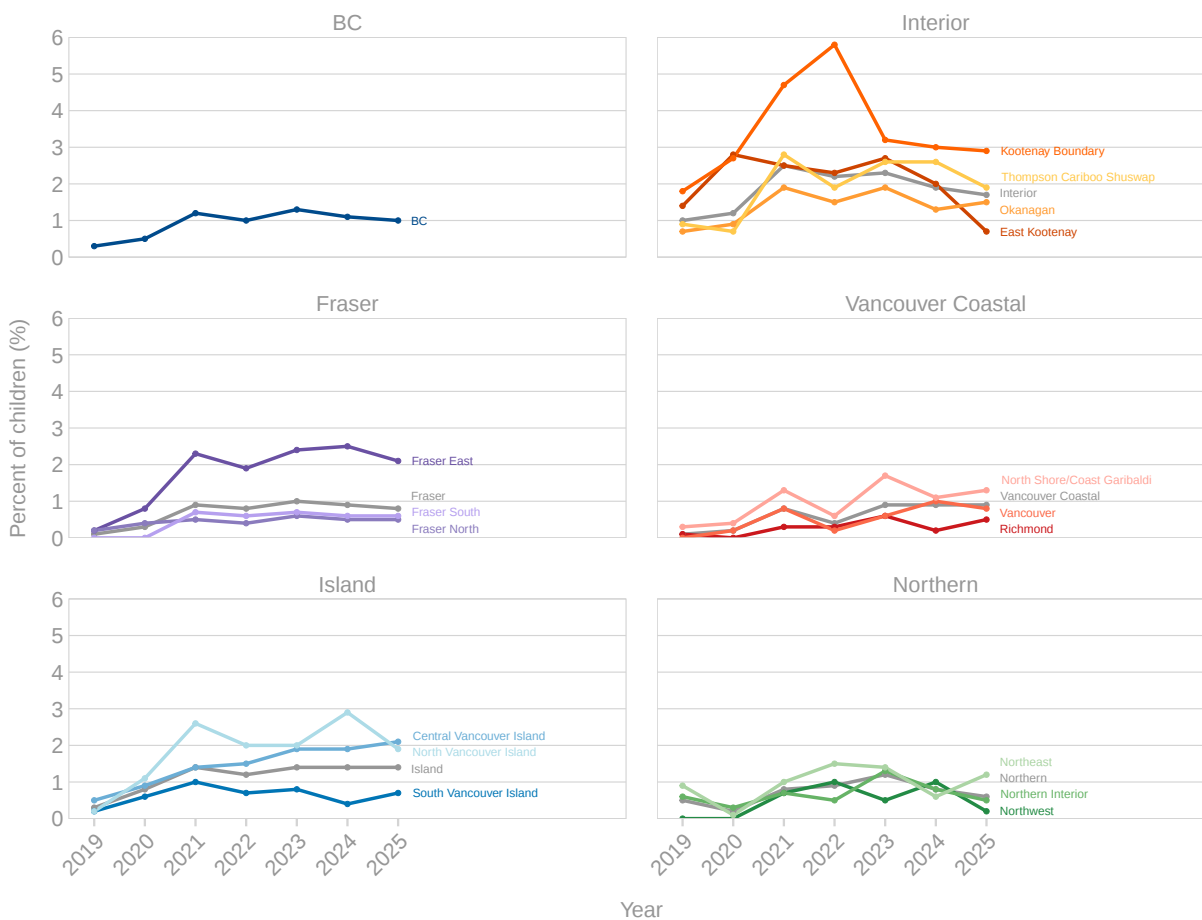


Figure 56. Refusal to all vaccines by year and geographic region, 7-year-olds, British Columbia

Data Notes

Data Sources

In 2025, coverage estimates for all health authorities are based on records extracted from the Provincial Immunization Registry (PIR) (including records transmitted from regional clinical systems) on July 31, 2025.

All doses are recorded in PIR 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 PIR.

Data sources used for each of the health authorities have changed over time as follows:

Health Authority	Year									
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
IH	Registry (birth cohort)		Registry (school cohort)							
FH	Registry (birth cohort)/MoE aggregate enrollment			Registry (school cohort)						
VCH	Registry (school cohort)^									
ISLH	Registry (birth cohort)/MoE aggregate enrollment			Registry (school cohort)						
NH	Registry (birth cohort)/MoE aggregate enrollment				Registry (school cohort)					

^In 2024, the data source for VCH transitioned from the VCH Primary Access Regional Information System (PARIS) to PIR.

Numerators and denominators are defined as follows:

Data source	Numerator	Denominator
Registry (birth cohort)	Number of children from the denominator who were up-to-date for the specified agent(s) by their seventh birthday.	Number of children in the birth cohort of interest with active records in the health authority's immunization registry or clinical system (PIR or PARIS).
Registry (school cohort)	Number of children from the denominator who were up-to-date for the specified agent(s) by their seventh birthday.	Number of children in the birth cohort of interest with active records in the health authority's immunization registry or clinical system (PIR or PARIS) indicating they were enrolled in a BC school as of June 30th of the most recent school year. Beginning in 2024, the data source for all health authorities is the PIR.
Registry (birth cohort)/MoE aggregate enrollment	Number of children in the birth cohort of interest with active records in the health authority's immunization registry or clinical system (PIR or PARIS) who were up-to-date for the specified agent(s) by their seventh birthday.	Number of children in the birth cohort of interest attending schools within the health authority, based on estimates derived from BC MoE enrollment statistics.

School and grade information is attached to students' records in the PIR in two ways:

- For schools using either the MyEducation BC (MyEdBC) or the Comprehensive Integrated Management System (CIMS) information systems and who have signed a letter of agreement, information is uploaded from a Ministry of Education (MoE) extract into PIR using a tool called STIX (Student Information Exchange). An analysis conducted in September 2023 found that for the 2022/2023 school year, this process included 95% of students in schools registered with the BC MoE. Health authority staff reconcile the school information against the PIR record when discrepancies occur. Efforts to onboard additional schools to MyEdBC continue.
- For schools using other information systems, health authority staff may manually enter or upload school and grade information. The process of adding enrollment details may not be completed for all health authorities and grades. Most health authorities prioritize immunization coverage assessment milestone grades (kindergarten, grade 6 and grade 9) and a small number of schools may not make their class lists available.

To maintain accurate denominators in an immunization registry, health authorities need to be aware of every child who moves into and out of the health region. Prior to 2020, not all health regions had been able to fully establish these processes. BC MoE enrollment data were considered more accurate estimates of the number of children in a health region than Panorama for ISLH (2015-2018), FH (2015-2018), and NH (2015-2019), while IH (2015-2017) used estimates based on birth cohort for both numerator and denominator. Between 2018 and 2020, the data sources for IH, FH, ISLH, and NH changed to more accurately reflect the population of the region, which may explain some differences observed in coverage rates when compared to previous years.

When different data sources are used for numerators and denominators, coverage results may appear as greater than 100%. When this occurred, the coverage rates were adjusted to 100%. Immunization coverage rates approaching 100% in FH (2015-2018), ISLH (2015-2018) and NH (2015-2019) are likely over-estimates resulting from the use of different data sources for numerators and denominators. This artifact was rectified when the health authorities began using the same data source for numerators and denominators.

Cohort

Coverage reported for any given year reflects uptake among children who turned seven years old during the previous calendar year (i.e., 2025 results are for children born in 2017 and who turned seven-years-old in 2024).

Calculations

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 and/or at a time interval greater than or equal to the shortest acceptable interval. Only doses given prior to the seventh birthday are included in the coverage assessment.

Coverage results by health authority and HSDA are reported based on the location of the child's school.

Limitations

All calculations are based on vaccine doses recorded in the PIR or regional clinical systems and school enrollment records maintained by regional health authorities using electronic enrollment records from the MoE, or records received directly from schools. To be considered up-to-date for age, documentation of every dose in the immunization registry (PIR) or a clinical system (PARIS) is required.

Immunization coverage rates presented here are impacted by:

- Children attending independent schools that are not captured within STIX or MyEdBC, including:
 - Independent schools not registered with the MoE
 - Independent schools using MyEdBC without a signed Letter of Agreement
 - Independent schools not using MyEdBC (in some cases, partial enrolment data may still exist in PIR if provided by health authorities)
 - First Nations schools that are federally funded, not within provincial education jurisdiction, and outside the scope of STIX or MyEdBC data collection processes
- Exclusions related to school-based data are driven by enrolment data limitations rather than immunization status. As such, individuals may be excluded from reporting even where immunization records exist in PIR.
- Children whose immunization records are incomplete in the PIR, including:
 - Those immunized in communities or clinical settings where records are not consistently submitted to PIR (e.g., private clinics or providers outside Regional Health Authority Public Health)
 - Children who have recently moved to or out of British Columbia
 - Children immunized outside of BC whose records have not been submitted or reconciled

Definitions

Up-to-date for age

Measure	Definition
Up-to-date for age	Children who met the up-to-date requirements for DTaP-IPV, hepatitis B, measles, mumps, rubella, and varicella as defined below.
DTaP-IPV	4th or 5th dose of diphtheria/acellular pertussis/tetanus and 3rd or 4th dose of polio on or after 4 years of age.
DTaP	4th or 5th dose of diphtheria/acellular pertussis/tetanus on or after 4 years of age.
Polio	3rd or 4th dose of polio on or after 4 years of age.
Hepatitis B	3rd dose of hepatitis B vaccine on or after 24 weeks of age.
Measles	2 doses of measles-containing vaccine or recorded exemption due to laboratory evidence of immunity/previous disease.
Mumps	2 doses of mumps-containing vaccine.
Rubella	At least 1 dose of rubella-containing vaccine or recorded exemption due to laboratory evidence of immunity/previous disease.
Varicella	1 (to 2014) or 2 (2015 onward) doses of varicella vaccine, or recorded exemption for varicella due to previous disease or protective antibody levels. The evidence required to be recorded as having a previous history of varicella disease or shingles has changed over time. See data notes for Varicella.
Refusal to all vaccines	Documented refusals for all of the following antigens: diphtheria, tetanus, pertussis, polio, hepatitis B, meningococcal C, measles, mumps, rubella, and varicella, and no recorded immunizations administered prior to the seventh birthday for any of the listed antigens. Refusals that are effective any time on or before the seventh birthday are counted, regardless of a documented end date, as long as the child is unimmunized.

Reasons for non-immunization

Measure	Definition
Exemption: Lab Evidence of Immunity	<i>For varicella, measles and rubella only.</i> For the agent/antigen of interest, does not meet the criteria for up-to-date and has an active exemption due to lab evidence of immunity/disease recorded prior to the milestone birthday.
Exemption: Previous Disease (varicella)	<i>For varicella only</i> Does not meet any of the previous definitions and has an active exemption due to previous disease for varicella recorded prior to the milestone birthday.
Partially Immunized with Contraindication	<i>For agents/antigens requiring more than one dose.</i> For the agent/antigen of interest, does not meet any of the previous definitions and has received at least one valid dose and has an active contraindication recorded prior to the milestone birthday.
Partially Immunized with Refusal	<i>For agents/antigens requiring more than one dose.</i> For the agent/antigen of interest, does not meet any of the previous definitions and has received at least one valid dose and has an active or inactive refusal recorded prior to the milestone birthday.
Partially Immunized - Unknown	<i>For agents/antigens requiring more than one dose.</i> For the agent/antigen of interest, does not meet any of the previous definitions and has received at least one valid dose. Note: These children may have invalid doses, inactive exemptions, or inactive contraindications for the agent/antigen of interest. They may also have valid/invalid doses or active or inactive 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.
Unimmunized with Contraindication	For the agent/antigen of interest, does not meet any of the previous definitions and has no recorded valid dose(s) and has an active contraindication recorded prior to the milestone birthday.
Unimmunized with Refusal	For the agent/antigen of interest, does not meet any of the previous definitions and has no recorded valid dose(s) and has an active or inactive refusal recorded prior to the milestone birthday.

Unimmunized - Unknown	For the agent/antigen of interest, does not meet any of the previous definitions and has no recorded valid dose(s) prior to the milestone birthday.
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Note: These children may have valid doses recorded on or after the milestone birthday or invalid doses, inactive exemptions, or inactive contraindications for the agent/antigen of interest recorded any time up to and including the data extract date. They may also have valid/invalid doses or active/inactive refusals, exemptions, or contraindications that do not apply to the agent/antigen of interest, or no recorded doses, refusals, exemptions, or contraindications for any agent/antigen.

2024 report onwards:

Unimmunized – Unknown: Immunization Record	Meets the 'Unimmunized - Unknown' definition and has at least one of the following: valid dose(s) for the agent/antigen of interest recorded on or after the milestone birthday, or invalid doses, inactive contraindications, or inactive exemptions for the agent/antigen of interest recorded at any time up to/including the data extract date or valid/invalid doses, active or inactive refusals, contraindications or exemptions that do not apply to the agent/antigen of interest recorded at any time up to/including the data extract date. The antigens considered include diphtheria, tetanus, pertussis, polio, hepatitis B, meningococcal C, measles, mumps, rubella, and varicella.
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Unimmunized – Unknown: No Immunization Record	Meets the 'Unimmunized - Unknown' definition and has no recorded valid or invalid doses or active or inactive refusals, exemptions, or contraindications for any of diphtheria, tetanus, pertussis, polio, hepatitis B, meningococcal C, measles, mumps, rubella, and varicella.
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Minimum Intervals and Ages Between Doses

Antigen/Agent	Minimum Age or Minimum Time Interval Between Eligible Doses			
	Dose 1 ^A	Dose 2	Dose 3	Dose 4
Diphtheria, tetanus, acellular pertussis (DTaP or Tdap)	42 days	28 days	28 days	24 weeks ^B
Polio ^C	42 days	28 days	24 weeks ^B	
Hepatitis B				
received 3 rd dose before June 2007	0 days	28 days	28 days	
received 3 rd dose between June 2007 and May 2014	0 days	28 days	56 days ^D	
received 3 rd dose in June 2014 or later	0 days	28 days	56 days ^{D,E}	
Measles	12 months	28 days		
Mumps	12 months	28 days		
Rubella ^F	12 months			
Varicella ^G	12 months	28 days		

- A. Dose 1 refers to the earliest age a child can receive the initial dose.
- B. Last dose must be given on or after 4 years of age.
- C. Schedule for DTaP should be followed when poliomyelitis provided in combination vaccine.
- D. Dose 3 must be given at least 16 weeks (112 days) after dose 1.
- E. Dose 3 must be given on or after 24 weeks of age.
- F. Schedule for measles/mumps should be followed when rubella provided in combination vaccine with measles/mumps.
- G. Dose must be given at least 8 weeks after any previous meningococcal C conjugate dose (if previous dose given).

Other Data Notes

Historical changes to the seven-year-old immunization coverage report:

- Starting in 2024, meningococcal C vaccine coverage was excluded from the up-to-date for age and by antigen coverage measures for seven-year-olds. Receipt of meningococcal-containing vaccine(s) is assessed at the 2nd birthday. While meningococcal C is not included as part of the up-to-date for age measure, it is considered when assessing for refusal to all vaccines, as children remain eligible to receive the vaccine.
- In 2016 (2008 birth cohort), the in-Panorama coverage report was used to assess immunization coverage because the routine method (analysis using an external analysis program) could not be applied. The in-Panorama reports allow for doses to be counted as adequate even if these do not meet the minimum age/interval criteria through a manual validation process at the user and record level. An assessment of the differences between estimates produced by the two reporting methods indicated that these produce very similar results. For the 2007 birth cohort, the difference in coverage results between the two reporting methods were less than 0.7% for all measures at the provincial level.
- In 2012 (2004 birth cohort), the seven-year-old coverage assessment became an official measure. Prior to this, assessment of school-entry immunization coverage was conducted at the end of kindergarten. This did not allow for complete capture of on-time immunizations since 'school-entry' doses are recommended at 4-6 years of age and the kindergarten assessment would not capture doses administered after kindergarten but before the seventh birthday. Due to the use of different data sources, seven-year old coverage results cannot be directly compared to kindergarten coverage results.

Immunization program and coverage assessment rule changes:

VCH 2015 birth cohort:

- In 2023 (2015 birth cohort), minor adjustments for VCH antigen coverage calculations were made to improve alignment with provincial coverage surveillance definitions. As such, caution is warranted when comparing 2023 VCH estimates to previous years.
- In VCH, the COVID-19 pandemic closed clinics during the 2020/21 school year. Due to this, the 2015 birth cohort (2023 estimates) did not receive their planned immunizations during kindergarten. As a result, catch-up efforts were implemented in subsequent years, leading to many immunizations occurring beyond the 7th birthday.

Northern Health (NH):

- In 2025, Northern Health (NH) is currently investigating the low rates of vaccine refusals to ascertain if they are true declines/increases or data flow issues.

Varicella:

- The evidence required to be recorded as having a previous history of varicella disease or shingles has changed over time. Beginning in December 2013, a varicella susceptible person was defined as having no history of varicella disease or shingles after 1 year of age and no history of age-appropriate varicella vaccination. A self-reported history of disease was adequate for those born before 2004, while a health care provider diagnosed history was required for those born in 2004 or later. Since June 2018, a varicella susceptible person is defined as one without a history of lab-confirmed varicella or shingles after 1 year of age and without a history of age-appropriate varicella vaccination. As such, the current definition requires lab evidence of prior disease on or after 1 year of age for proof of immunity. The date of varicella disease onset is not systematically entered into PIR, therefore, for the purposes of this assessment, any child with a varicella exemption effective as of the 7th birthday is considered protected, regardless of their age at the time of illness.
- In January 2012, the BC immunization schedule introduced a second dose of varicella at school entry (4-6 years) (offered as combined MMRV beginning in 2014), thus the varicella requirement changed

from requiring one to two doses for a child to be considered up-to-date. Children born in 2007 (2015 report) were the first cohort to be affected by this change. As a result of this change, the percent of children born in 2007 who were considered up-to-date for varicella decreased considerably compared to previous years. If only one dose of varicella vaccine had been required for the 2007 birth cohort, the percent of children up-to-date for varicella would have been 24% higher (93%) and the percent of up-to-date for age would have been 6% higher (69%). See the [History of Immunization in BC](#).

- Starting in 2015, only exemptions for previous varicella disease that were effective at the time of the 7th birthday were considered as proof of immunity, while in previous years all recorded exemptions for previous disease in Panorama were considered as proof of immunity. This change only applied to a small number of children and did not have an appreciable effect on overall coverage rates.

Measles, mumps, and rubella:

- In 2025, in addition to the routine immunization clinics held across HAs, FH increased the number of school age clinic appointments available over the summer to accommodate for more MMR immunizations.
- In 2019, BC launched a measles catch-up immunization program for school-age children, which ran between April 1 and June 30, 2019. This program resulted in the collection of measles-related immunization records that were not previously reported to public health and some catch-up immunization with measles/mumps/rubella (MMR) or measles/mumps/rubella/varicella vaccine (MMRV). The impact of this program cannot be assessed using the routine seven-year-old immunization coverage data due to the concurrent change in [data sources](#) for immunization coverage assessment and the implementation of the [Vaccination Status Reporting Regulation](#) (see PIR notes below), which may have contributed to improved immunization record documentation.
- In January 2012, the second dose of MMR vaccine was moved from 18-months to school entry (4-6 years of age) (offered as combined MMRV beginning in 2014). The first group of children affected by this change was those born in July 2010, or those receiving their second dose of MMR-containing vaccine in 2012 or later. The change in immunization schedule may have resulted in fewer opportunities to provide the second dose of MMR-containing vaccine prior to the seventh birthday, explaining the drop in measles and mumps coverage in the 2018 report year. The impact of this program change could not be assessed in the 2019 report due to changes in [data sources](#) and the measles catch-up immunization program for school-age children that resulted in the collection of measles-related immunization records (see above). For further information, see the [History of Immunization in BC](#).

PIR notes:

- As of December 2024, the flow of supplementary information on the reasons for non-immunization (i.e., exemptions, refusals, and contraindications) for children in Fraser Health (FH) is supported by the interface between the FH clinical system and PIR.
 - Before 2025, incomplete supplementary information on reasons for non-immunization likely resulted in the overestimation of the proportion of partially immunized and unimmunized FH seven-year-olds with unknown reasons for non-immunization and the underestimation of the number of children partially immunized or unimmunized due to refusals or contraindications, as well as the number of children with protection against varicella, measles, and rubella due to previous infection and/or lab evidence of immunity. Caution should be used in comparing 2025 estimates for the reasons for non-immunization and documented refusals in FH to prior years.
- In 2020, the proportion of children with refusals to all vaccines increased over the prior year in all health authorities except NH. This is likely related to improved documentation of refusals as a result of the implementation of the [Vaccination Status Reporting Regulation](#), which supports the collection of immunization records (including refusals) of school-age children by public health.
- In spring 2020, PIR was updated to include all clients from the Ministry of Health (MoH) Client Roster. The population is maintained via regular feeds from MoH's Registration and Premium Information Determination (RAPID) system for new clients eligible for Medical Services Plan (MSP) coverage and

Enterprise Master Patient Index (EMPI) for births and deaths. This should provide more complete information on the entire BC population in PIR.

- Client records with no or inadequate immunizations recorded may reflect children who have moved out of the province or died. When public health is not aware of these events, they cannot update the Panorama records to reflect the status of these children. Records reported by provinces with reciprocal agreements with MSP for individuals who have moved out of BC and established health insurance in other Canadian jurisdictions are inactivated through the RAPID system process outlined above.
- Between June 2015 and January 2018 the Panorama records of children born in 2008-2013 that had been inactivated because they received the majority of their immunizations from First Nations Health Services Organizations (FNHSOs), were reactivated to facilitate Panorama use by those FNHSOs that had adopted this system. Historically, records of these clients would not be included in provincial immunization estimates as their immunizations were recorded in other systems and therefore expected to be incomplete within Panorama. The overall effect of activating the Panorama records was an increase of up to 0.1% in the provincial immunization coverage estimate for children up-to-date for age in 2015-2018. This ranged from a decrease of 0.5% to an increase of 1.5% at the health authority level and a decrease of 1.1% to an increase of 2.1% at the HSDA level. When the school enrollment denominators were used for the coverage calculations, the denominators remained the same. As such, any change in the proportion up-to-date for age reflected the fact that additional children were being counted in the numerator. When Panorama data were used for both the numerators and denominators, the inclusion of the records that had previously been inactivated resulted in small declines in coverage, likely due to the inclusion of children with incomplete Panorama records.
- Starting in 2015, doses marked invalid in Panorama due to vaccine interactions and manual invalidation were excluded from counts, while in previous years these invalid doses in Panorama had been counted. At the provincial level, this change resulted in a decrease in coverage rates that ranged 0-0.5% for all measures.