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An agency of the Provincial Health Services Authority

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Immunization Coverage in Children by the Second Birthday

2013-2023

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Provincial Health Services Authority
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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	PIR	Provincial Immunization Registry
DTaP	Diphtheria, tetanus, acellular pertussis	DTaP-IPV-Hib	Diphtheria, tetanus, acellular pertussis, polio, *Haemophilus influenzae* type b
DTaP-IPV	Diphtheria, tetanus, acellular pertussis, polio	MMR	Measles, mumps, rubella

For an explanation of BC Health Authorities, please visit this website.

Executive Summary

Infants in BC are currently recommended to receive thirteen doses of seven different vaccines that protect against thirteen diseases: diphtheria, tetanus, pertussis, polio, *Haemophilus influenzae* type b (Hib), hepatitis B, measles, mumps, rubella, varicella, pneumococcal disease, meningococcal serogroup C disease, and rotavirus. For most doses, the recommended age milestones for receipt are 2, 4, 6, or 12 months with a booster dose of DTaP-IPV-Hib at 18 months.

Childhood immunization coverage is routinely assessed at milestone ages in BC. This report outlines coverage among two-year-olds from 2013 to 2023 including indicators of whether infants received specific antigens/agents by the second birthday, all routine immunizations by the second birthday, and all routine immunizations except the 18-month booster dose by the second birthday. As a signatory to Canada's Vaccination Coverage Goals and Vaccine Preventable Disease Reduction Targets by 2025, BC aims to achieve 95% vaccination coverage by two years for the following vaccines: diphtheria, tetanus, pertussis and Hib, polio, hepatitis B, MMR, varicella, pneumococcal conjugate, and meningococcal C conjugate.

Following a period of stable coverage from 2016 to 2020, the proportion of two-year-olds in BC who were up-to-date for all routine immunizations declined from 73% in 2020 to 70% in 2021 and has remained stable through 2022 and 2023 (Figure 1). The percentage of infants who received all routine vaccines excluding the 18-month booster peaked at 83-84% in 2019/2020 before declining to 79% in 2021 (Figure 3). The rate further declined by 1% for each of the past two years, reaching 77% in 2023. These declines in coverage coincide with the COVID-19 pandemic as the 2019 birth cohort (2021 report) was scheduled to receive their 12- and 18-month vaccine doses starting in 2020. BC initially implemented a province-wide shut down which impacted the provision of public health services as well as in-person clinical services by physician providers. The pandemic response continued through 2022; routine childhood immunization may have been affected in some regions due to rescheduled appointments or longer wait times. Up-to-date coverage has not rebounded to pre-pandemic rates with only 69% of two-year-olds in 2023 having received all recommended routine immunizations by their second birthday, which also remains well below the 95% coverage target.

In the regional health authorities, 2023 up-to-date coverage ranged from 59% to 74% (Figure 1); coverage was highest in Island Health (74%), with comparable rates in Interior Health and Fraser Health (69-70%), and the lowest coverage in Northern Health (59%). Rates in Interior and Fraser Health have followed a similar trend as BC overall with relatively stable coverage from 2021 to 2023. During this time period, Northern Health has observed a more rapid downward trend with annual declines of 2-4%. Conversely, Island Health only observed a small decline in up-to-date coverage from 2020 to 2021 and rates have since improved.

The percentage of two-year-olds who were up-to-date for all routine immunizations except the 18-month booster ranged from 69% to 81% at the health authority level in 2023 (Figure 3). Whereas overall up-to-date coverage was relatively stable in Interior and Fraser Health from 2021 to 2023, up-to-date minus booster coverage declined slightly during this time period. Compared to last year, Northern Health saw the largest decrease (3%) in up-to-date minus booster coverage. The gap between the proportion of infants fully up-to-date and up-to-date minus the booster was 8% provincially (Table 1) and ranged from 7-10% at the health authority level (Table 2). While this indicates that many infants are receiving immunizations recommended in the first year of life, there is an opportunity to improve uptake of the 18-month booster vaccines.

At the health service delivery area (HSDA) level, there was a notable decline in up-to-date (6%) and up-to-date minus booster coverage (7%) in Northwest in 2023 compared to 2022 (Table 6). Conversely,

Kootenay Boundary saw a 5% improvement in up-to-date coverage to 67% in 2023 with up-to-date minus booster coverage comparable to 2022 at 71% (Table 3). This indicates that, compared to 2022, a higher proportion of vaccinated infants received the 18-month booster as further demonstrated by the 5% increases in DTaP, polio, and Hib rates.

Across all antigens/agents, provincial coverage declined by a similar magnitude (1%) in 2023 (Figure 2). Rates in 2023 were lowest for DTaP-containing agents (72%) and highest for hepatitis B and MMR (82%). As shown in Table 2, health authority-level coverage was within 1-2% of the 2022 rate for most antigens/agents, however, in Northern Health hepatitis B, pneumococcal conjugate, and rotavirus coverage declined by 3%. Within Northern Health, Northwest had the largest declines compared to 2022 with a 6% decline in DTaP-IPV-Hib and varicella; 5% decline in DTaP-IPV, hepatitis B, Hib, and polio; and a 4% decline in MMR, meningococcal C, rotavirus, and pneumococcal conjugate (Table 6). Antigen coverage in Northern Interior and Northeast were comparable to 2022 rates, except for hepatitis B and rotavirus in Northern Interior which declined by 3% and 4%, respectively.

Approximately 10% of two-year-olds in BC had no routine immunizations recorded prior to their second birthday, which is comparable to the 2022 rate (Table 1). However, the proportion of children with no immunizations recorded has been steadily increasing since 2019 with this figure ranging from 8% (Island) to 14% (Northern) at the health authority level. Few children had refusals on file for all antigens (<1%).

Limitations

Due to different methodology, VCH data is excluded from provincial coverage estimates and their coverage is reported separately (see Two-year-olds with Up-to-date Immunizations by Health Authority and Health Service Delivery Area, Vancouver Coastal Health).[a] All calculations are based on vaccine doses recorded in PIR. Doses administered by providers other than public health and not reported to public health or PIR may not be reported in the registry. There may be lag times in data entry. Data should be interpreted with caution. Please refer to the **Notes** for additional information.

The BCCDC Immunization Coverage Dashboard is available online here.

[a] Provincial estimates do not include Vancouver Coastal Health (see Notes)

Up-to-date for age

Up-to-date for age in British Columbia

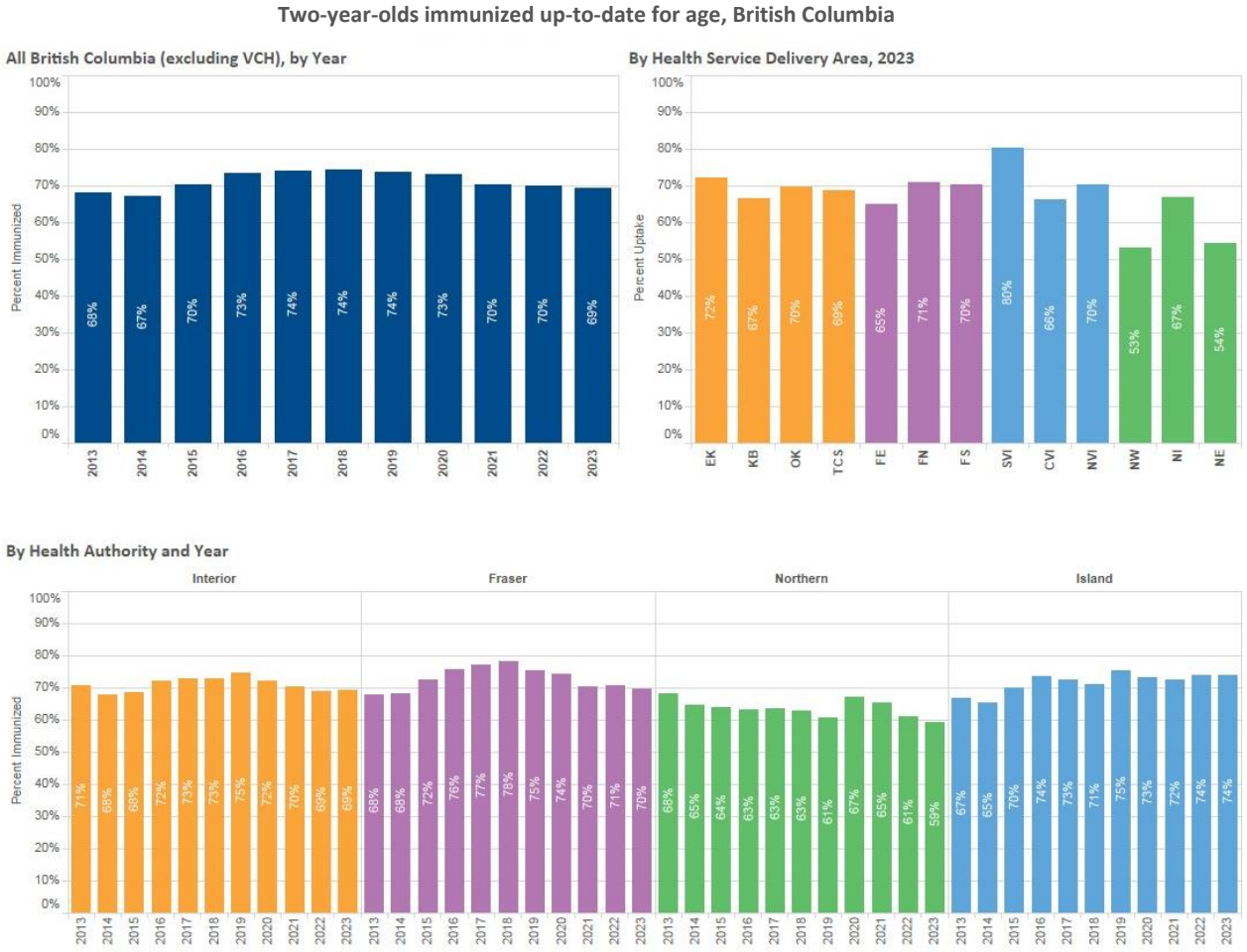
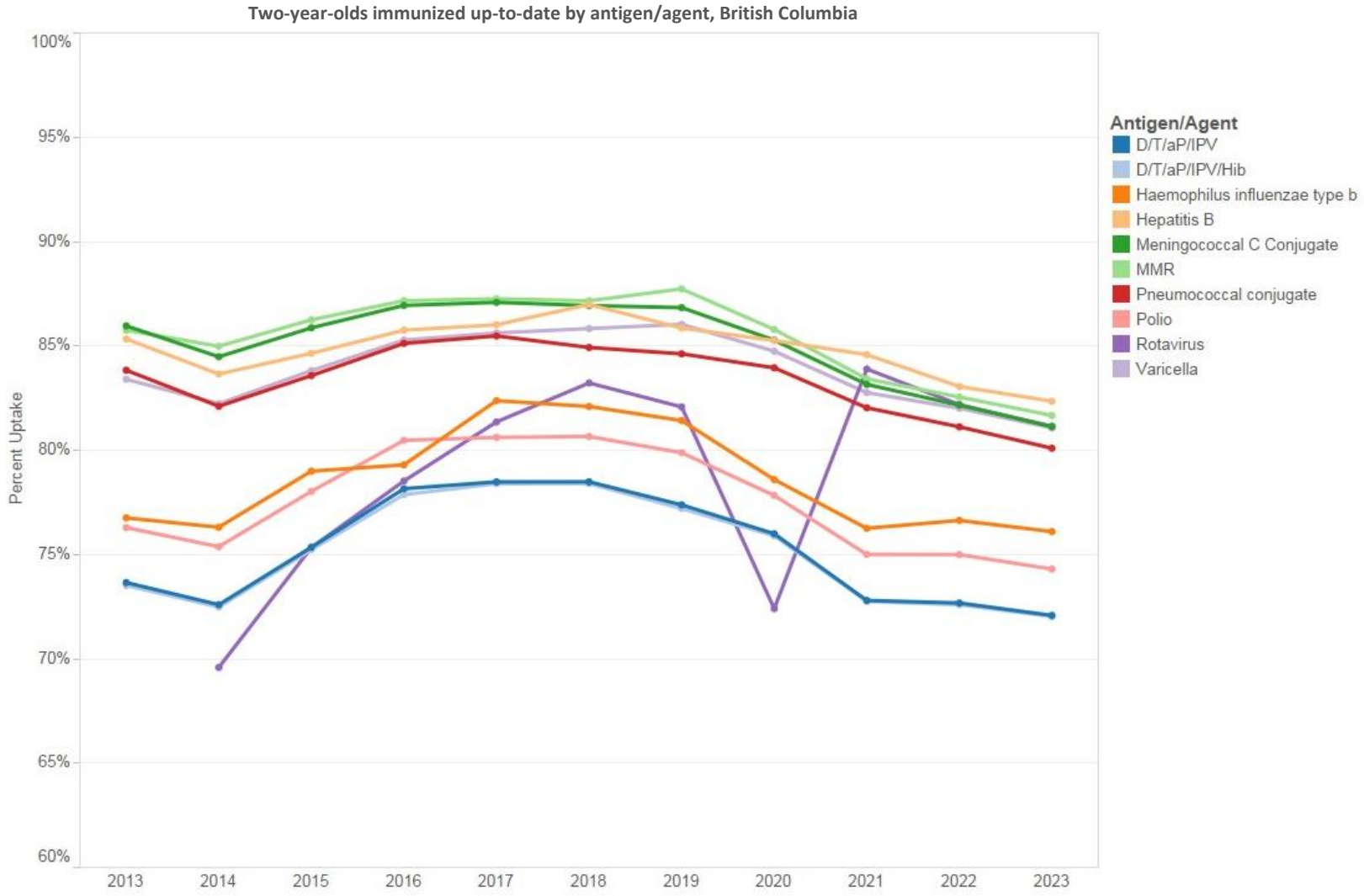


Figure 1. Percent of two-year-olds immunized up-to-date for age, British Columbia[a]



Note: Axis ranges from 60% to 100%

Figure 2. Percent of two-year-olds immunized up-to-date by antigen/agent, British Columbia[a]

Table 1. Percent of two-year-olds with up-to-date immunizations, British Columbia[a]

Vaccination Details	Year										
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Up-to-date for age	**68%**	**67%**	**70%**	**73%**	**74%**	**74%**	**74%**	**73%**	**70%**	**70%**	**69%**
Up-to-date minus the booster	**78%**	**76%**	**78%**	**80%**	**81%**	**81%**	**84%**	**83%**	**79%**	**78%**	**77%**
Specific Agents											
DTaP-IPV	74%	73%	75%	78%	78%	78%	77%	76%	73%	73%	72%
DTaP-IPV-Hib	74%	72%	75%	78%	78%	78%	77%	76%	73%	73%	72%
Hepatitis B	85%	84%	85%	86%	86%	87%	86%	85%	85%	83%	82%
Hib	77%	76%	79%	79%	82%	82%	81%	79%	76%	77%	76%
MMR	86%	85%	86%	87%	87%	87%	88%	86%	83%	83%	82%
Polio	76%	75%	78%	80%	81%	81%	80%	78%	75%	75%	74%
Varicella	83%	82%	84%	85%	86%	86%	86%	85%	83%	82%	81%
Pneumococcal conjugate	84%	82%	83%	85%	85%	85%	85%	84%	82%	81%	80%
Meningococcal C	86%	84%	86%	87%	87%	87%	87%	85%	83%	82%	81%
Rotavirus[b]	n/a	70%	75%	79%	81%	83%	82%	72%	84%	82%	81%
No immunizations recorded	n/a	n/a	7%	7%	6%	6%	6%	8%	9%	10%	10%
Refusal to all[c]	n/a	n/a	2%	2%	2%	1%	1%	1%	0%	1%	0%

[b] Rotavirus was added to BC's routine infant immunization schedule in January 2012; therefore the 2012 birth cohort (2014 report) was the first cohort eligible for this series. Three doses of rotavirus were required for the 2020 report. See Notes.

[c] PIR does not contain complete supplementary information on refusals for FH and refusal rates will be underestimated. See Notes.

Up-to-date for age minus booster in British Columbia

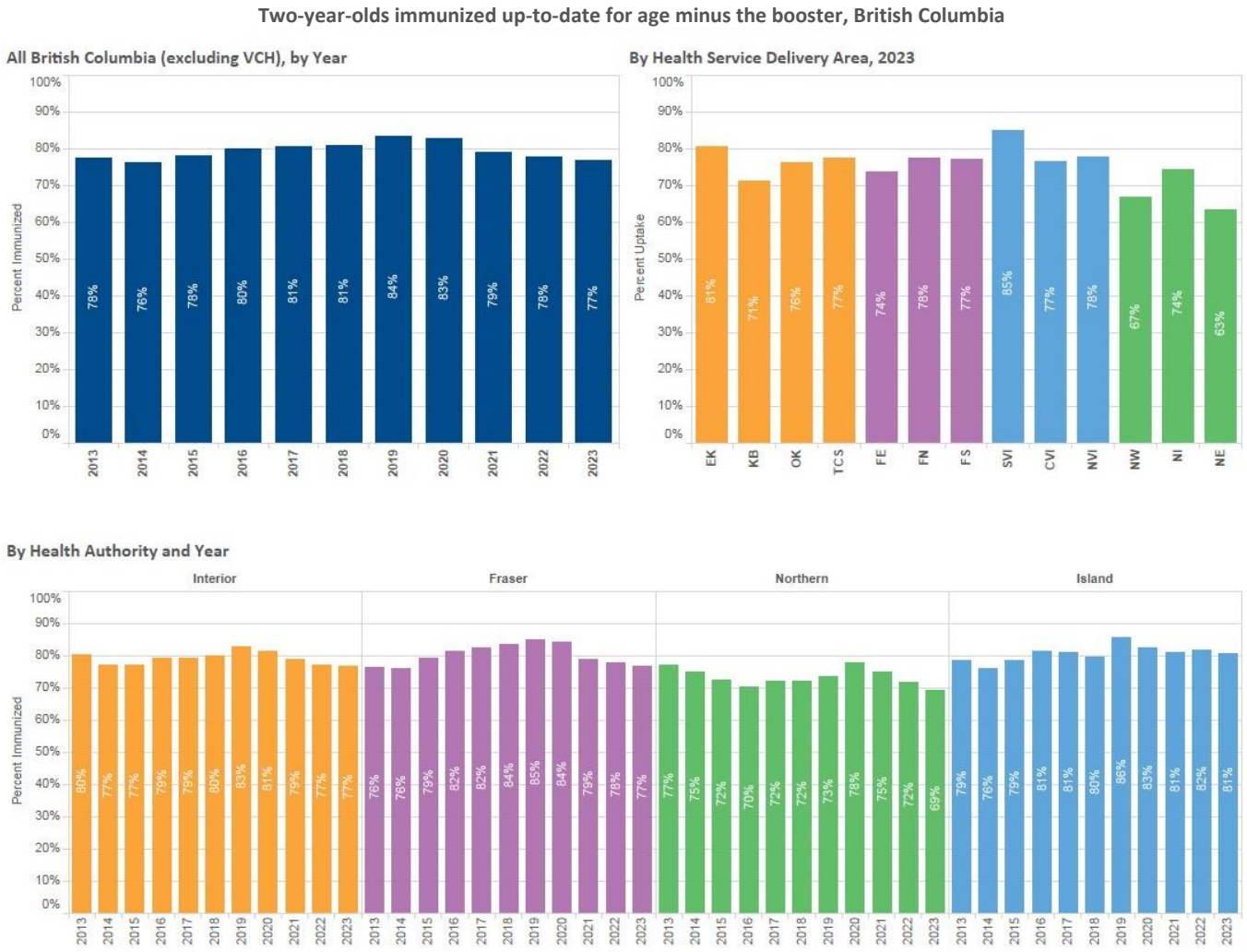


Figure 3. Percent of two-year-olds immunized up-to-date for age minus the booster, British Columbia

Up-to-date for age by Health Authority

Table 2. Percent of two-year-olds with up-to date immunizations by Health Authority

Health Authority	Vaccination Details	Year										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Interior Health IH	**Up-to-date for age**	**71%**	**68%**	**68%**	**72%**	**73%**	**73%**	**75%**	**72%**	**70%**	**69%**	**69%**
	Up-to-date minus the booster	**80%**	**77%**	**77%**	**79%**	**79%**	**80%**	**83%**	**81%**	**79%**	**77%**	**77%**
	Specific Agents											
	DTaP-IPV	76%	73%	73%	76%	77%	77%	78%	75%	72%	71%	71%
	DTaP-IPV-Hib	75%	73%	73%	76%	77%	77%	78%	74%	72%	70%	71%
	Hepatitis B	87%	84%	84%	85%	85%	86%	85%	85%	85%	83%	82%
	Hib	78%	76%	76%	78%	80%	80%	81%	76%	75%	74%	75%
	MMR	87%	85%	84%	86%	86%	86%	87%	85%	82%	81%	80%
	Polio	77%	75%	75%	78%	79%	78%	79%	76%	74%	72%	73%
	Varicella	84%	81%	81%	83%	83%	84%	85%	83%	81%	80%	79%
	Pneumococcal conjugate	86%	83%	83%	84%	85%	85%	85%	84%	82%	80%	79%
	Meningococcal C	88%	85%	84%	86%	86%	86%	87%	84%	82%	81%	80%
	Rotavirus	n/a	69%	70%	73%	77%	80%	81%	72%	82%	80%	78%
	No immunizations recorded	n/a	n/a	9%	9%	8%	8%	8%	10%	10%	11%	13%
	Refusal to all	n/a	n/a	3%	2%	3%	2%	2%	1%	1%	1%	1%
Fraser Health FH	**Up-to-date for age**	**68%**	**68%**	**72%**	**76%**	**77%**	**78%**	**75%**	**74%**	**70%**	**71%**	**70%**
	Up-to-date minus the booster	**76%**	**76%**	**79%**	**82%**	**82%**	**84%**	**85%**	**84%**	**79%**	**78%**	**77%**
	Specific Agents											
	DTaP-IPV	74%	74%	77%	81%	82%	82%	79%	78%	73%	74%	73%
	DTaP-IPV-Hib	74%	74%	77%	80%	82%	82%	79%	78%	73%	74%	73%
	Hepatitis B	84%	83%	85%	87%	88%	89%	87%	86%	84%	83%	82%
	Hib	77%	77%	81%	82%	85%	86%	83%	81%	77%	78%	77%
	MMR	85%	85%	87%	89%	89%	89%	88%	87%	84%	83%	82%
	Polio	77%	76%	80%	83%	84%	84%	81%	80%	76%	77%	75%
	Varicella	84%	83%	86%	88%	88%	89%	87%	86%	84%	83%	82%
	Pneumococcal conjugate	83%	82%	84%	86%	87%	87%	86%	85%	82%	82%	81%
	Meningococcal C	85%	84%	87%	88%	89%	89%	88%	86%	84%	83%	81%
	Rotavirus	n/a	69%	79%	83%	85%	86%	85%	74%	85%	84%	83%
	No immunizations recorded	n/a	n/a	6%	6%	5%	5%	5%	7%	8%	9%	10%
	Refusal to all[c]	n/a	n/a	1%	1%	2%	1%	1%	0%	0%	0%	0%
Island Health ISLH	**Up-to-date for age**	**67%**	**65%**	**70%**	**74%**	**73%**	**71%**	**75%**	**73%**	**72%**	**74%**	**74%**
	Up-to-date minus the booster	**79%**	**76%**	**79%**	**81%**	**81%**	**80%**	**86%**	**83%**	**81%**	**82%**	**81%**

Health Authority	Vaccination Details	Year										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
	Specific Agents											
	DTaP-IPV	71%	70%	74%	78%	77%	75%	79%	75%	75%	76%	76%
	DTaP-IPV-Hib	71%	70%	74%	77%	76%	75%	78%	75%	74%	76%	76%
	Hepatitis B	86%	84%	85%	87%	87%	86%	88%	86%	86%	86%	86%
	Hib	75%	75%	79%	79%	81%	80%	83%	78%	78%	80%	79%
	MMR	85%	85%	87%	88%	88%	86%	90%	86%	85%	85%	85%
	Polio	74%	74%	78%	80%	79%	78%	81%	77%	76%	78%	78%
	Varicella	83%	82%	84%	86%	86%	85%	88%	85%	84%	85%	84%
	Pneumococcal conjugate	84%	83%	84%	86%	86%	84%	88%	84%	84%	84%	84%
	Meningococcal C	86%	85%	86%	88%	87%	86%	89%	85%	85%	85%	85%
	Rotavirus	n/a	70%	73%	76%	81%	81%	82%	72%	84%	83%	83%
	No immunizations recorded	n/a	n/a	6%	6%	5%	6%	5%	8%	8%	8%	8%
	Refusal to all	n/a	n/a	1%	1%	2%	1%	1%	1%	1%	1%	1%
Northern Health NH	**Up-to-date for age**	**68%**	**65%**	**63%**	**63%**	**63%**	**63%**	**61%**	**67%**	**65%**	**61%**	**59%**
	Up-to-date minus the booster	**77%**	**75%**	**72%**	**70%**	**72%**	**72%**	**73%**	**78%**	**75%**	**72%**	**69%**
	Specific Agents											
	DTaP-IPV	73%	70%	70%	69%	68%	68%	65%	70%	68%	63%	61%
	DTaP-IPV-Hib	73%	70%	69%	69%	68%	68%	65%	70%	68%	63%	61%
	Hepatitis B	86%	84%	82%	79%	80%	82%	74%	81%	82%	79%	76%
	Hib	76%	74%	73%	70%	73%	72%	74%	74%	72%	67%	66%
	MMR	85%	84%	81%	80%	79%	79%	80%	82%	80%	76%	75%
	Polio	76%	73%	72%	72%	71%	70%	70%	73%	70%	65%	64%
	Varicella	80%	80%	77%	77%	77%	77%	78%	80%	78%	75%	74%
	Pneumococcal conjugate	84%	81%	78%	78%	77%	77%	72%	79%	78%	75%	72%
	Meningococcal C	85%	84%	81%	80%	79%	79%	79%	81%	80%	76%	74%
	Rotavirus	n/a	71%	69%	72%	75%	79%	71%	68%	80%	77%	74%
	No immunizations recorded	n/a	n/a	8%	9%	11%	8%	10%	11%	10%	13%	14%
	Refusal to all	n/a	n/a	2%	2%	2%	1%	1%	0%	0%	0%	0%

Up-to-date for age by Health Service Delivery Area

Interior Health

Table 3. Percent of two-year-olds with up-to-date immunizations by Health Service Delivery Area, Interior Health

HSDA	Vaccination Details	Year										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
East Kootenay EK	**Up-to-date for age**	**67%**	**71%**	**72%**	**78%**	**78%**	**78%**	**76%**	**78%**	**77%**	**74%**	**72%**
	Up-to-date minus the booster	**79%**	**78%**	**80%**	**83%**	**82%**	**83%**	**84%**	**85%**	**84%**	**81%**	**81%**
	Specific Agents											
	DTaP-IPV	74%	77%	78%	84%	82%	83%	81%	81%	78%	75%	76%
	DTaP-IPV-Hib	74%	77%	78%	84%	82%	83%	81%	81%	78%	75%	76%
	Hepatitis B	87%	86%	86%	89%	87%	90%	85%	89%	88%	87%	84%
	Hib	77%	81%	82%	85%	86%	86%	84%	84%	82%	78%	80%
	MMR	89%	89%	89%	91%	89%	91%	90%	89%	88%	84%	85%
	Polio	76%	80%	80%	85%	84%	85%	82%	83%	80%	76%	77%
	Varicella	86%	84%	85%	88%	86%	87%	88%	87%	86%	83%	84%
	Pneumococcal conjugate	87%	86%	87%	90%	88%	88%	87%	87%	86%	84%	84%
	Meningococcal C	89%	88%	89%	91%	89%	91%	89%	88%	87%	85%	85%
	Rotavirus	n/a	71%	71%	77%	80%	86%	83%	75%	85%	83%	80%
	No immunizations recorded	n/a	n/a	6%	5%	7%	5%	6%	8%	8%	8%	10%
	Refusal to all	n/a	n/a	4%	2%	4%	3%	2%	2%	2%	2%	1%
Kootenay Boundary KB	**Up-to-date for age**	**57%**	**51%**	**58%**	**60%**	**58%**	**66%**	**66%**	**62%**	**59%**	**62%**	**67%**
	Up-to-date minus the booster	**65%**	**63%**	**65%**	**68%**	**67%**	**72%**	**76%**	**73%**	**69%**	**72%**	**71%**
	Specific Agents											
	DTaP-IPV	67%	60%	66%	67%	66%	71%	71%	65%	61%	65%	70%
	DTaP-IPV-Hib	67%	60%	66%	66%	66%	71%	71%	65%	61%	65%	70%
	Hepatitis B	79%	74%	76%	76%	77%	79%	81%	79%	78%	79%	78%
	Hib	71%	64%	71%	68%	71%	76%	76%	68%	67%	69%	74%
	MMR	79%	76%	77%	77%	80%	81%	83%	79%	75%	76%	77%
	Polio	69%	62%	68%	69%	68%	73%	74%	66%	63%	67%	71%
	Varicella	70%	68%	69%	72%	74%	77%	78%	76%	72%	75%	75%
	Pneumococcal conjugate	77%	72%	75%	76%	77%	79%	80%	77%	73%	74%	76%
	Meningococcal C	79%	75%	77%	78%	79%	80%	82%	78%	75%	76%	77%
	Rotavirus	n/a	54%	51%	59%	62%	68%	69%	64%	71%	75%	72%
	No immunizations recorded	n/a	n/a	6%	15%	13%	13%	10%	14%	15%	15%	15%
	Refusal to all	n/a	n/a	4%	3%	3%	3%	2%	2%	1%	2%	1%

HSDA	Vaccination Details	Year										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Okanagan	**Up-to-date for age**	**72%**	**67%**	**70%**	**73%**	**74%**	**73%**	**75%**	**72%**	**71%**	**69%**	**70%**
OK	**Up-to-date minus the booster**	**81%**	**76%**	**78%**	**80%**	**81%**	**80%**	**83%**	**81%**	**78%**	**76%**	**76%**
	Specific Agents											
	DTaP-IPV	76%	72%	74%	77%	78%	76%	78%	75%	73%	70%	71%
	DTaP-IPV-Hib	76%	72%	74%	77%	78%	76%	78%	75%	73%	70%	71%
	Hepatitis B	88%	83%	84%	85%	86%	85%	86%	85%	84%	81%	81%
	Hib	78%	74%	77%	79%	81%	79%	80%	76%	75%	73%	74%
	MMR	87%	83%	85%	86%	86%	86%	87%	84%	81%	79%	79%
	Polio	78%	74%	76%	79%	80%	77%	79%	76%	74%	71%	73%
	Varicella	85%	80%	82%	83%	84%	84%	85%	82%	80%	78%	79%
	Pneumococcal conjugate	87%	82%	83%	85%	86%	84%	85%	83%	81%	78%	79%
	Meningococcal C	88%	83%	84%	86%	86%	86%	86%	83%	81%	79%	79%
	Rotavirus	n/a	69%	73%	74%	79%	80%	81%	73%	82%	78%	78%
	No immunizations recorded	n/a	n/a	8%	8%	8%	9%	8%	10%	11%	13%	14%
	Refusal to all	n/a	n/a	3%	2%	3%	2%	2%	1%	1%	1%	1%
Thompson Cariboo Shuswap	**Up-to-date for age**	**76%**	**74%**	**69%**	**72%**	**73%**	**74%**	**77%**	**73%**	**70%**	**70%**	**69%**
TCS	**Up-to-date minus the booster**	**86%**	**83%**	**79%**	**80%**	**80%**	**82%**	**85%**	**84%**	**81%**	**80%**	**78%**
	Specific Agents											
	DTaP-IPV	78%	78%	72%	76%	76%	77%	79%	75%	72%	71%	70%
	DTaP-IPV-Hib	78%	78%	72%	76%	76%	77%	79%	75%	72%	71%	70%
	Hepatitis B	90%	89%	86%	85%	85%	87%	87%	86%	87%	85%	83%
	Hib	81%	80%	75%	77%	80%	80%	82%	77%	75%	75%	74%
	MMR	91%	89%	85%	86%	86%	87%	88%	86%	84%	84%	81%
	Polio	80%	80%	75%	79%	78%	79%	80%	77%	74%	73%	72%
	Varicella	89%	86%	83%	85%	84%	86%	86%	85%	83%	83%	80%
	Pneumococcal conjugate	90%	88%	84%	84%	85%	86%	86%	85%	84%	82%	80%
	Meningococcal C	91%	89%	85%	86%	86%	88%	88%	86%	84%	84%	81%
	Rotavirus	n/a	75%	73%	75%	76%	80%	82%	71%	84%	84%	79%
	No immunizations recorded	n/a	n/a	8%	9%	9%	8%	7%	8%	8%	9%	11%
	Refusal to all	n/a	n/a	2%	2%	2%	2%	2%	1%	1%	1%	2%

Fraser Health

Table 4. Percent of two-year-olds with up-to-date immunizations by Health Service Delivery Area, Fraser Health[c]

HSDA	Vaccination Details	Year										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Fraser East FE	**Up-to-date for age**	**67%**	**68%**	**71%**	**75%**	**77%**	**78%**	**75%**	**73%**	**68%**	**66%**	**65%**
	Up-to-date minus the booster	**77%**	**77%**	**80%**	**82%**	**82%**	**84%**	**84%**	**83%**	**78%**	**76%**	**74%**
	Specific Agents											
	DTaP-IPV	71%	71%	75%	78%	80%	80%	78%	75%	70%	68%	67%
	DTaP-IPV-Hib	71%	71%	75%	78%	80%	80%	78%	75%	70%	68%	67%
	Hepatitis B	85%	84%	86%	87%	87%	88%	87%	85%	84%	80%	79%
	Hib	74%	75%	79%	80%	85%	83%	82%	78%	74%	75%	73%
	MMR	84%	84%	86%	87%	88%	88%	88%	85%	82%	80%	78%
	Polio	73%	74%	78%	80%	82%	82%	80%	77%	73%	72%	70%
	Varicella	81%	81%	83%	85%	86%	86%	86%	84%	82%	80%	78%
	Pneumococcal conjugate	82%	81%	84%	86%	87%	87%	86%	83%	81%	79%	76%
	Meningococcal C	84%	84%	86%	87%	88%	88%	87%	85%	82%	81%	78%
	Rotavirus	n/a	70%	73%	77%	80%	81%	81%	73%	82%	77%	76%
	No immunizations recorded	n/a	n/a	7%	7%	7%	7%	7%	9%	8%	11%	12%
	Refusal to all	n/a	n/a	3%	3%	4%	2%	2%	2%	0%	0%	0%
Fraser North FN	**Up-to-date for age**	**66%**	**67%**	**71%**	**74%**	**76%**	**78%**	**74%**	**73%**	**70%**	**70%**	**71%**
	Up-to-date minus the booster	**74%**	**74%**	**77%**	**80%**	**81%**	**83%**	**83%**	**83%**	**78%**	**76%**	**78%**
	Specific Agents											
	DTaP-IPV	74%	74%	77%	80%	81%	83%	79%	77%	73%	74%	75%
	DTaP-IPV-Hib	73%	73%	77%	80%	81%	83%	78%	77%	73%	74%	75%
	Hepatitis B	83%	81%	84%	85%	86%	89%	86%	84%	84%	82%	84%
	Hib	77%	77%	80%	81%	85%	86%	82%	80%	77%	78%	79%
	MMR	84%	84%	86%	87%	88%	90%	87%	86%	83%	82%	84%
	Polio	76%	76%	80%	82%	83%	85%	81%	79%	75%	77%	77%
	Varicella	83%	82%	85%	86%	87%	90%	86%	85%	83%	82%	83%
	Pneumococcal conjugate	81%	80%	83%	85%	86%	87%	84%	83%	81%	81%	82%
	Meningococcal C	84%	83%	86%	87%	88%	90%	86%	85%	83%	81%	83%
	Rotavirus	n/a	66%	79%	83%	85%	87%	84%	73%	85%	84%	84%
	No immunizations recorded	n/a	n/a	7%	6%	6%	5%	6%	8%	9%	10%	9%
	Refusal to all	n/a	n/a	1%	1%	1%	1%	0%	0%	0%	0%	0%
Fraser South FS	**Up-to-date for age**	**69%**	**69%**	**74%**	**77%**	**78%**	**79%**	**76%**	**76%**	**72%**	**73%**	**70%**
	Up-to-date minus the booster	**78%**	**77%**	**81%**	**83%**	**84%**	**84%**	**86%**	**86%**	**80%**	**80%**	**77%**
	Specific Agents											

HSDA	Vaccination Details	Year										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
	DTaP-IPV	75%	75%	79%	82%	83%	83%	80%	79%	75%	77%	74%
	DTaP-IPV-Hib	75%	75%	79%	82%	83%	83%	80%	79%	75%	76%	74%
	Hepatitis B	85%	85%	86%	88%	89%	89%	88%	87%	85%	85%	83%
	Hib	79%	79%	83%	83%	86%	86%	83%	82%	79%	80%	78%
	MMR	87%	87%	89%	90%	90%	89%	90%	88%	85%	85%	83%
	Polio	78%	78%	82%	85%	85%	85%	82%	81%	77%	79%	76%
	Varicella	86%	85%	88%	89%	90%	89%	89%	88%	85%	85%	83%
	Pneumococcal conjugate	84%	83%	86%	88%	88%	87%	87%	87%	84%	84%	81%
	Meningococcal C	87%	86%	88%	90%	90%	89%	89%	88%	85%	85%	82%
	Rotavirus	n/a	72%	82%	84%	87%	87%	87%	74%	87%	86%	84%
	No immunizations recorded	n/a	n/a	5%	4%	4%	5%	4%	6%	7%	8%	9%
	Refusal to all	n/a	n/a	1%	1%	1%	0%	1%	0%	0%	0%	0%

Island Health

Table 5. Percent of two-year-olds with up-to-date immunizations by Health Service Delivery Area, Island Health

HSDA	Vaccination Details	Year										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
South Vancouver Island SVI	**Up-to-date for age**	**69%**	**68%**	**74%**	**76%**	**76%**	**76%**	**79%**	**78%**	**77%**	**79%**	**80%**
	Up-to-date minus the booster	**81%**	**78%**	**81%**	**82%**	**83%**	**83%**	**89%**	**85%**	**84%**	**84%**	**85%**
	Specific Agents											
	DTaP-IPV	73%	74%	79%	80%	81%	80%	83%	81%	79%	81%	82%
	DTaP-IPV-Hib	73%	74%	79%	80%	80%	80%	83%	81%	79%	80%	82%
	Hepatitis B	88%	86%	87%	88%	89%	89%	90%	88%	88%	88%	89%
	Hib	77%	77%	82%	81%	83%	83%	85%	82%	81%	83%	85%
	MMR	87%	87%	89%	89%	89%	89%	92%	88%	87%	87%	89%
	Polio	76%	77%	81%	82%	82%	82%	84%	82%	81%	82%	84%
	Varicella	84%	83%	86%	86%	88%	87%	90%	87%	87%	87%	88%
	Pneumococcal conjugate	86%	85%	87%	87%	87%	86%	90%	87%	87%	86%	88%
	Meningococcal C	88%	86%	89%	88%	89%	88%	91%	87%	87%	87%	88%
	Rotavirus	n/a	73%	77%	79%	84%	84%	86%	78%	86%	85%	88%
	No immunizations recorded	n/a	n/a	5%	5%	4%	5%	4%	7%	7%	8%	7%
	Refusal to all	n/a	n/a	1%	1%	1%	0%	0%	0%	0%	1%	0%
Central Vancouver Island CVI	**Up-to-date for age**	**62%**	**58%**	**64%**	**69%**	**67%**	**64%**	**69%**	**67%**	**65%**	**67%**	**66%**
	Up-to-date minus the booster	**76%**	**73%**	**75%**	**79%**	**78%**	**76%**	**83%**	**79%**	**77%**	**79%**	**77%**
	Specific Agents											
	DTaP-IPV	66%	63%	68%	74%	71%	68%	72%	69%	67%	69%	68%
	DTaP-IPV-Hib	66%	63%	68%	73%	71%	68%	72%	69%	67%	69%	68%
	Hepatitis B	84%	82%	83%	85%	83%	83%	86%	84%	83%	85%	83%
	Hib	71%	69%	75%	75%	78%	74%	78%	72%	72%	74%	73%
	MMR	83%	82%	84%	87%	85%	83%	88%	83%	81%	83%	81%
	Polio	70%	68%	73%	77%	75%	72%	77%	72%	70%	72%	71%
	Varicella	80%	79%	81%	84%	83%	81%	86%	81%	80%	82%	80%
	Pneumococcal conjugate	81%	79%	81%	84%	82%	80%	85%	81%	79%	81%	80%
	Meningococcal C	83%	82%	83%	86%	85%	83%	87%	82%	81%	83%	81%
	Rotavirus	n/a	67%	68%	72%	76%	77%	78%	65%	81%	81%	79%
	No immunizations recorded	n/a	n/a	6%	6%	7%	7%	6%	9%	9%	9%	9%
	Refusal to all	n/a	n/a	2%	2%	3%	2%	1%	2%	3%	2%	2%
	Up-to-date for age	**69%**	**69%**	**70%**	**75%**	**73%**	**73%**	**75%**	**72%**	**73%**	**74%**	**70%**
	Up-to-date minus the booster	**78%**	**78%**	**79%**	**84%**	**82%**	**80%**	**84%**	**81%**	**81%**	**81%**	**78%**
	Specific Agents											

HSDA	Vaccination Details	Year										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
North Vancouver Island NVI	DTaP-IPV	75%	74%	75%	78%	77%	77%	79%	74%	75%	76%	72%
	DTaP-IPV-Hib	75%	74%	75%	78%	76%	77%	79%	74%	75%	76%	72%
	Hepatitis B	85%	85%	83%	89%	87%	85%	87%	84%	87%	85%	82%
	Hib	79%	79%	80%	80%	81%	83%	85%	77%	79%	79%	76%
	MMR	87%	86%	87%	90%	88%	87%	90%	87%	85%	84%	82%
	Polio	78%	77%	79%	81%	79%	81%	82%	77%	77%	78%	74%
	Varicella	83%	82%	84%	87%	86%	85%	87%	84%	84%	84%	81%
	Pneumococcal conjugate	85%	85%	85%	88%	87%	85%	87%	84%	84%	83%	79%
	Meningococcal C	86%	86%	87%	89%	88%	87%	89%	86%	85%	84%	81%
	Rotavirus	n/a	68%	70%	76%	81%	80%	79%	67%	83%	82%	79%
	No immunizations recorded	n/a	n/a	7%	5%	5%	6%	6%	8%	8%	8%	11%
	Refusal to all	n/a	n/a	1%	1%	1%	1%	1%	1%	1%	0%	2%

Northern Health

Table 6. Percent of two-year-olds with up-to-date immunizations by Health Service Delivery Area, Northern Health

HSDA	Vaccination Details	Year										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Northwest NW	**Up-to-date for age**	**60%**	**56%**	**56%**	**58%**	**57%**	**57%**	**61%**	**62%**	**62%**	**59%**	**53%**
	Up-to-date minus the booster	**74%**	**71%**	**65%**	**67%**	**67%**	**68%**	**73%**	**75%**	**73%**	**74%**	**67%**
	Specific Agents											
	DTaP-IPV	67%	62%	62%	64%	61%	63%	64%	65%	65%	61%	56%
	DTaP-IPV-Hib	67%	62%	62%	64%	61%	63%	64%	65%	65%	61%	55%
	Hepatitis B	86%	80%	75%	77%	74%	79%	75%	79%	81%	80%	75%
	Hib	72%	68%	66%	66%	67%	68%	74%	69%	71%	67%	62%
	MMR	85%	82%	76%	76%	75%	76%	81%	79%	79%	78%	74%
	Polio	71%	67%	66%	67%	64%	66%	70%	68%	68%	64%	59%
	Varicella	79%	79%	73%	73%	72%	74%	79%	77%	76%	78%	72%
	Pneumococcal conjugate	84%	78%	72%	73%	73%	74%	73%	76%	76%	76%	71%
	Meningococcal C	86%	82%	76%	76%	75%	77%	80%	78%	78%	78%	74%
	Rotavirus	n/a	66%	66%	72%	69%	76%	72%	66%	77%	77%	73%
	No immunizations recorded	n/a	n/a	11%	10%	13%	10%	8%	12%	10%	10%	12%
	Refusal to all	n/a	n/a	1%	1%	1%	1%	0%	0%	0%	0%	0%
Northern Interior NI	**Up-to-date for age**	**76%**	**75%**	**72%**	**71%**	**71%**	**68%**	**65%**	**74%**	**72%**	**67%**	**67%**
	Up-to-date minus the booster	**83%**	**84%**	**79%**	**78%**	**79%**	**76%**	**76%**	**83%**	**81%**	**76%**	**74%**
	Specific Agents											
	DTaP-IPV	79%	79%	78%	77%	77%	72%	68%	76%	74%	69%	68%
	DTaP-IPV-Hib	79%	79%	78%	76%	77%	72%	68%	76%	74%	69%	68%
	Hepatitis B	91%	90%	89%	85%	87%	86%	77%	85%	86%	83%	80%
	Hib	81%	81%	81%	78%	80%	75%	77%	80%	77%	73%	74%
	MMR	89%	90%	88%	87%	86%	82%	81%	87%	85%	80%	80%
	Polio	81%	81%	80%	79%	79%	73%	72%	79%	76%	71%	71%
	Varicella	86%	87%	85%	84%	83%	81%	79%	86%	84%	79%	79%
	Pneumococcal conjugate	88%	89%	85%	85%	84%	80%	74%	83%	83%	79%	77%
	Meningococcal C	89%	90%	88%	87%	86%	82%	80%	87%	85%	80%	80%
	Rotavirus	n/a	80%	77%	78%	82%	85%	75%	74%	85%	84%	80%
	No immunizations recorded	n/a	n/a	4%	5%	6%	5%	8%	7%	8%	9%	10%
	Refusal to all	n/a	n/a	1%	1%	2%	1%	0%	0%	0%	0%	0%
Northeast NE	**Up-to-date for age**	**63%**	**57%**	**60%**	**55%**	**57%**	**61%**	**56%**	**62%**	**58%**	**54%**	**54%**
	Up-to-date minus the booster	**71%**	**66%**	**69%**	**62%**	**66%**	**69%**	**70%**	**73%**	**68%**	**63%**	**64%**

HSDA	Vaccination Details	Year										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
	Specific Agents											
	DTaP-IPV	69%	64%	66%	62%	62%	66%	60%	66%	61%	56%	57%
	DTaP-IPV-Hib	69%	63%	66%	62%	62%	66%	60%	66%	61%	56%	57%
	Hepatitis B	81%	78%	79%	74%	74%	79%	71%	76%	76%	72%	71%
	Hib	72%	68%	70%	63%	65%	71%	70%	68%	64%	59%	60%
	MMR	80%	76%	78%	73%	72%	77%	77%	76%	73%	68%	68%
	Polio	71%	66%	69%	65%	64%	69%	67%	67%	63%	58%	59%
	Varicella	74%	71%	74%	69%	70%	74%	75%	75%	71%	66%	67%
	Pneumococcal conjugate	79%	74%	75%	70%	71%	75%	69%	74%	72%	67%	66%
	Meningococcal C	80%	76%	78%	73%	73%	77%	77%	75%	73%	68%	68%
	Rotavirus	n/a	63%	64%	62%	70%	73%	64%	61%	73%	68%	66%
	No immunizations recorded	n/a	n/a	11%	14%	15%	12%	14%	15%	16%	20%	21%
	Refusal to all	n/a	n/a	3%	3%	3%	1%	1%	0%	0%	0%	0%

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

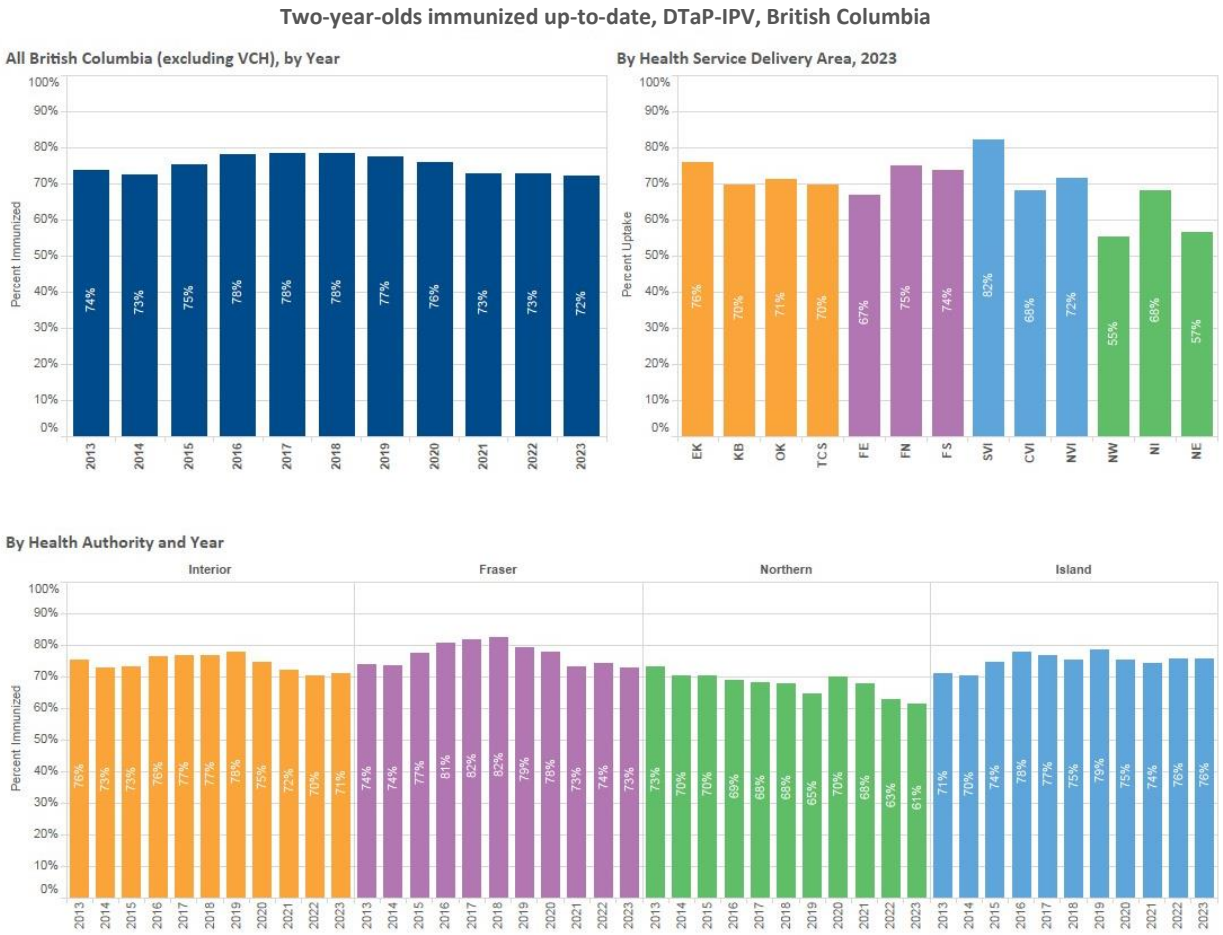


Figure 4. Percent of two-year-olds immunized up-to-date, DTaP-IPV, British Columbia

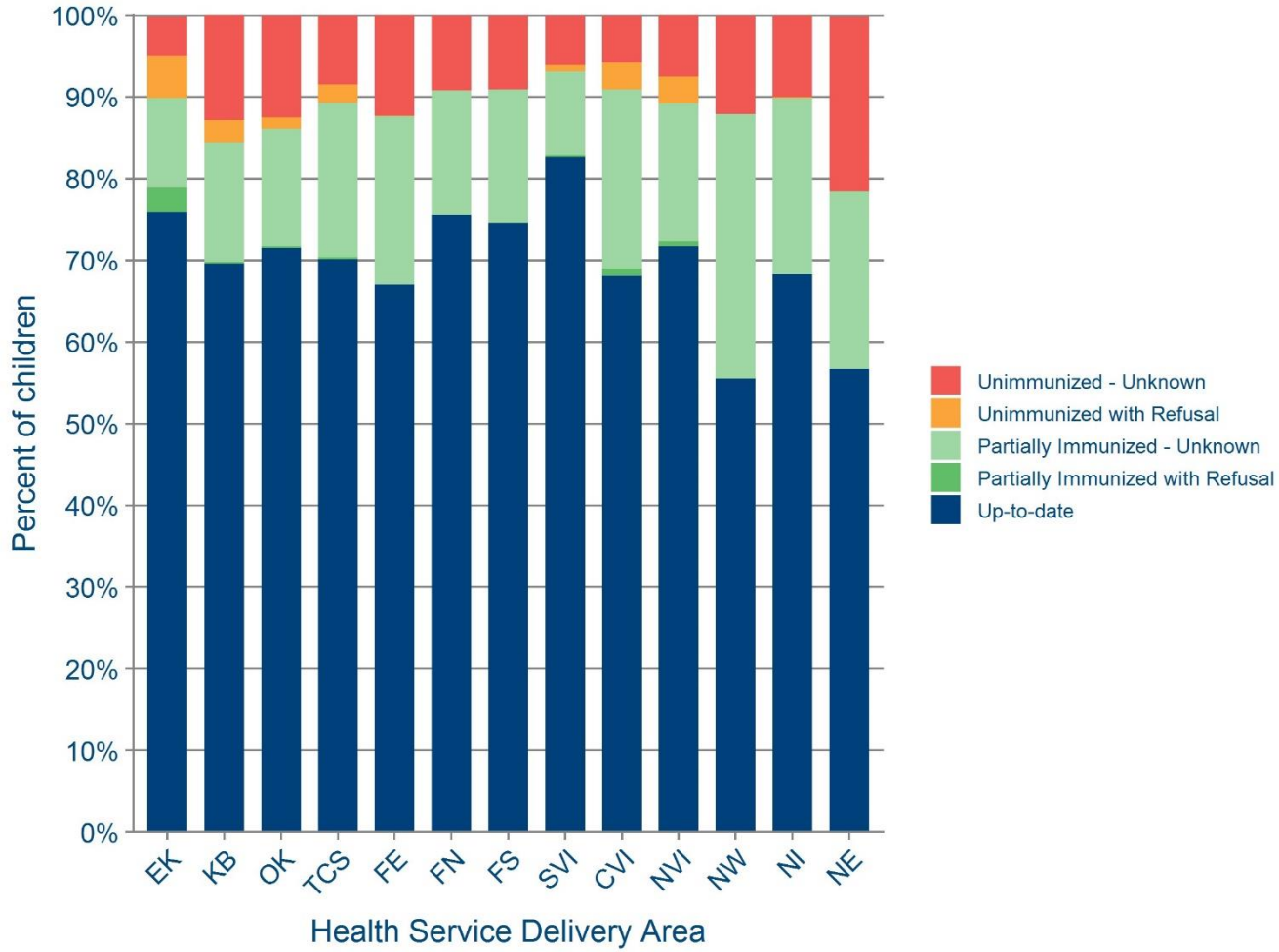


Figure 5. Reasons for non-immunization by Health Service Delivery Area, DTaP, British Columbia, 2023

Table 7. Reasons for non-immunization, DTaP, British Columbia, 2023

Region	Population	Count					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**70**	**0**	**6,388**	**291**	**0**	**3,642**
Interior Health	**6,885**	**36**	**0**	**1,060**	**149**	**0**	**723**
East Kootenay	765	23	0	84	40	0	37
Kootenay Boundary	598	1	0	88	16	0	77
Okanagan	3,444	6	0	495	47	0	432
Thompson Cariboo Shuswap	2,078	6	0	393	46	0	177
Fraser Health[e]	**20,860**	**1**	**0**	**3,486**	**3**	**0**	**2,032**
Fraser East	3,836	1	0	789	2	0	475
Fraser North	6,970	0	0	1,060	0	0	639
Fraser South	10,054	0	0	1,637	1	0	918
Island Health	**6,726**	**33**	**0**	**1,036**	**138**	**0**	**421**
South Vancouver Island	3,302	6	0	340	26	0	203
Central Vancouver Island	2,354	21	0	515	77	0	137
North Vancouver Island	1,070	6	0	181	35	0	81
Northern Health	**3,299**	**0**	**0**	**806**	**1**	**0**	**466**
Northwest	851	0	0	276	0	0	103
Northern Interior	1,427	0	0	308	1	0	143
Northeast	1,021	0	0	222	0	0	220

[d] Unknown includes all children who are partially immunized or unimmunized who do not have a documented refusal or contraindication. See Notes.

[e] PIR does not contain complete supplementary information on reasons for non-immunization for FH. See Notes.

Table 7 (continued).

Region	Population	Percent					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**0%**	**0%**	**17%**	**1%**	**0%**	**10%**
Interior Health	**6,885**	**1%**	**0%**	**15%**	**2%**	**0%**	**10%**
East Kootenay	765	3%	0%	11%	5%	0%	5%
Kootenay Boundary	598	0%	0%	15%	3%	0%	13%
Okanagan	3,444	0%	0%	14%	1%	0%	12%
Thompson Cariboo Shuswap	2,078	0%	0%	19%	2%	0%	8%
Fraser Health[e]	**20,860**	**0%**	**0%**	**17%**	**0%**	**0%**	**10%**
Fraser East	3,836	0%	0%	21%	0%	0%	12%
Fraser North	6,970	0%	0%	15%	0%	0%	9%
Fraser South	10,054	0%	0%	16%	0%	0%	9%
Island Health	**6,726**	**0%**	**0%**	**15%**	**2%**	**0%**	**6%**
South Vancouver Island	3,302	0%	0%	10%	1%	0%	6%
Central Vancouver Island	2,354	1%	0%	22%	3%	0%	6%
North Vancouver Island	1,070	1%	0%	17%	3%	0%	8%
Northern Health	**3,299**	**0%**	**0%**	**24%**	**0%**	**0%**	**14%**
Northwest	851	0%	0%	32%	0%	0%	12%
Northern Interior	1,427	0%	0%	22%	0%	0%	10%
Northeast	1,021	0%	0%	22%	0%	0%	22%

Diphtheria, Tetanus, Pertussis, Polio, *Haemophilus influenzae* type b (DTaP-IPV-Hib)

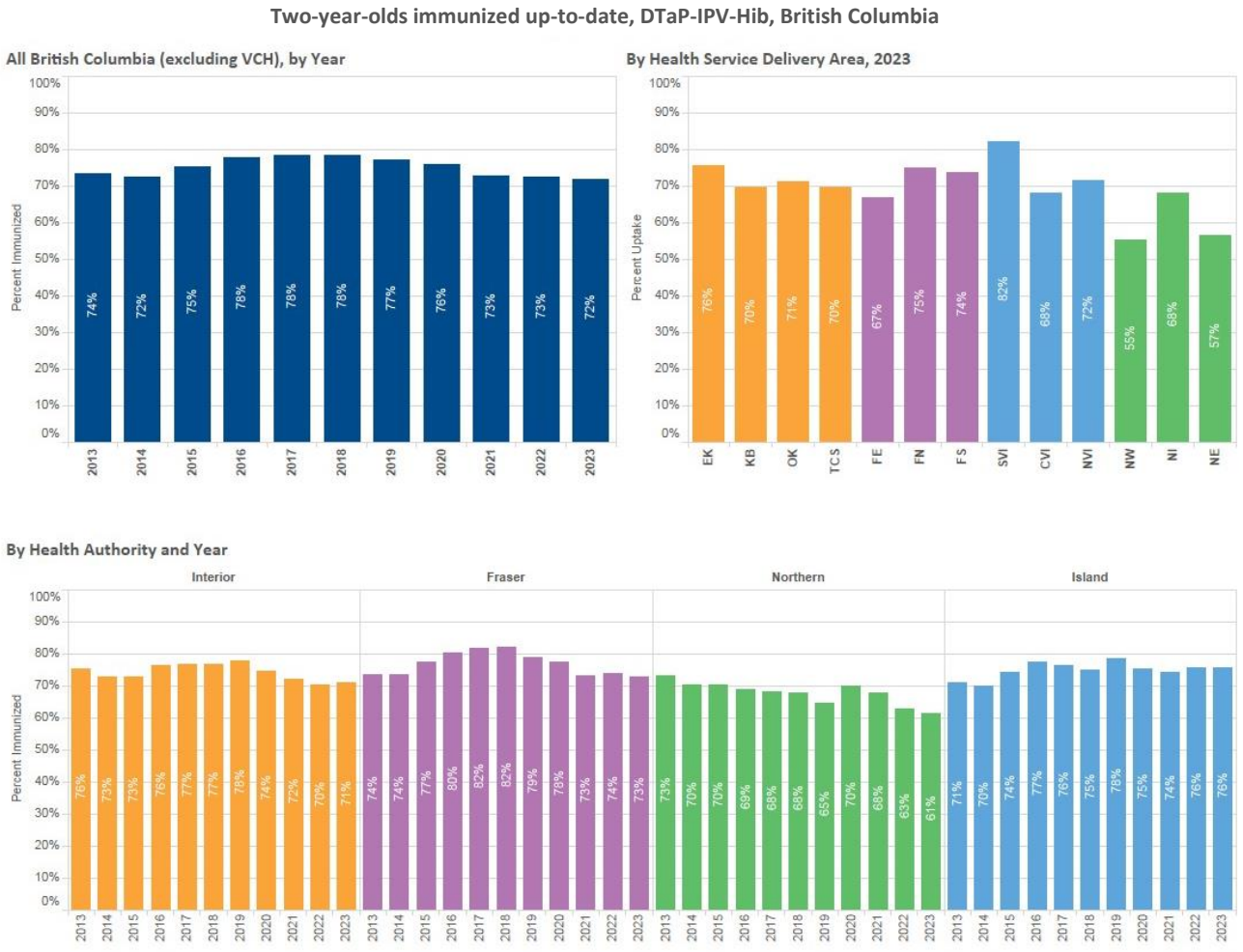


Figure 6. Percent of two-year-olds immunized up-to-date, DTaP-IPV-Hib, British Columbia

Haemophilus influenzae type b (Hib)

Figure 7. Percent of two-year-olds immunized up-to-date, Hib, British Columbia

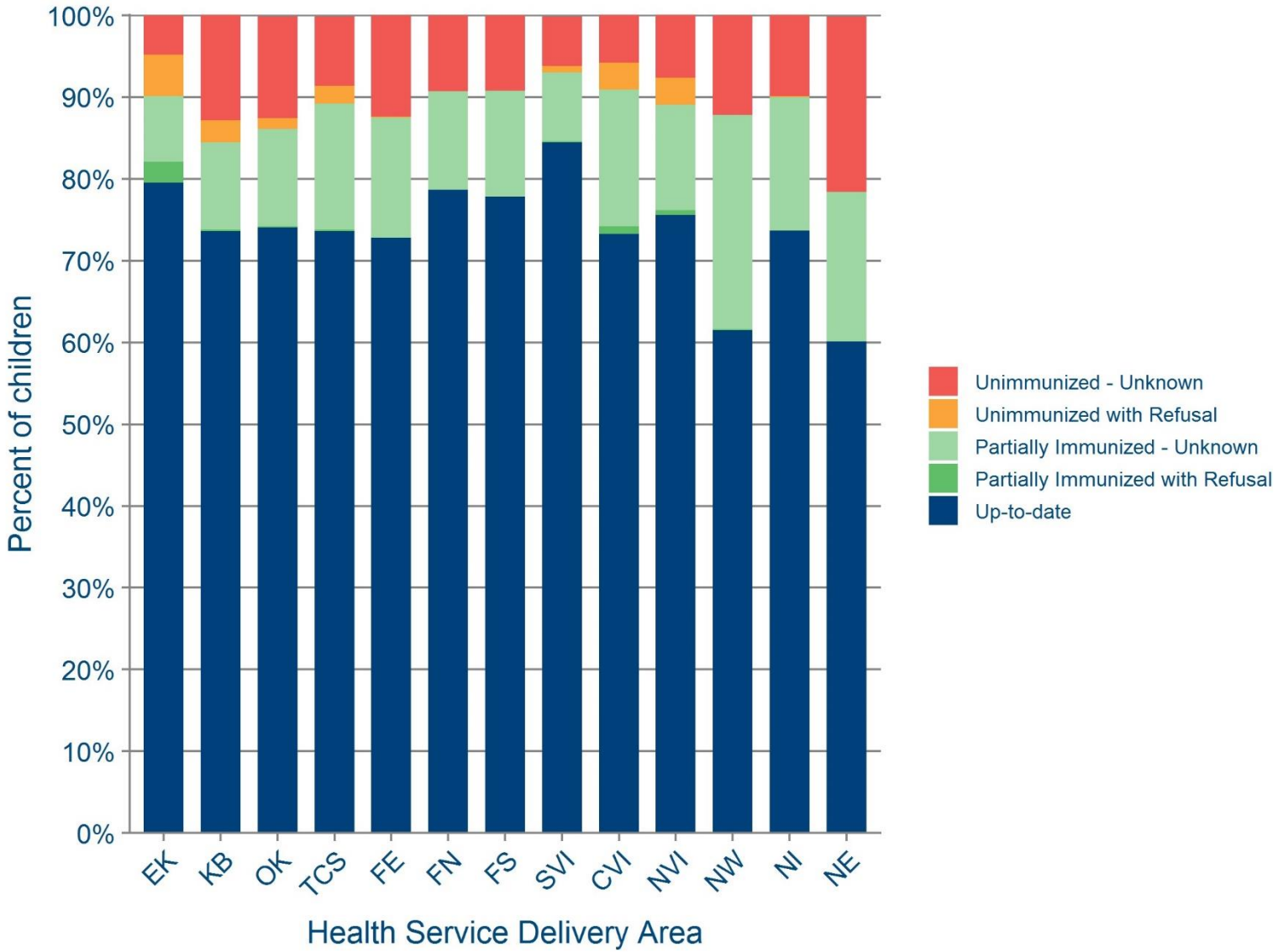


Figure 8. Reasons for non-immunization by Health Service Delivery Area, Hib, British Columbia, 2023

Table 8. Reasons for non-immunization, Hib, British Columbia, 2023

Region	Population	Count					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**63**	**0**	**5,019**	**287**	**0**	**3,658**
Interior Health	**6,885**	**31**	**0**	**855**	**146**	**0**	**723**
East Kootenay	765	20	0	61	39	0	37
Kootenay Boundary	598	1	0	64	16	0	77
Okanagan	3,444	5	0	410	45	0	432
Thompson Cariboo Shuswap	2,078	5	0	320	46	0	177
Fraser Health[e]	**20,860**	**0**	**0**	**2,712**	**3**	**0**	**2,045**
Fraser East	3,836	0	0	565	2	0	475
Fraser North	6,970	0	0	839	0	0	649
Fraser South	10,054	0	0	1,308	1	0	921
Island Health	**6,726**	**31**	**0**	**810**	**137**	**0**	**423**
South Vancouver Island	3,302	4	0	279	25	0	203
Central Vancouver Island	2,354	21	0	393	77	0	138
North Vancouver Island	1,070	6	0	138	35	0	82
Northern Health	**3,299**	**1**	**0**	**642**	**1**	**0**	**467**
Northwest	851	1	0	223	0	0	104
Northern Interior	1,427	0	0	232	1	0	143
Northeast	1,021	0	0	187	0	0	220

Table 8 (continued).

Region	Population	Percent					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**0%**	**0%**	**13%**	**1%**	**0%**	**10%**
Interior Health	**6,885**	**0%**	**0%**	**12%**	**2%**	**0%**	**10%**
East Kootenay	765	3%	0%	8%	5%	0%	5%
Kootenay Boundary	598	0%	0%	11%	3%	0%	13%
Okanagan	3,444	0%	0%	12%	1%	0%	12%
Thompson Cariboo Shuswap	2,078	0%	0%	15%	2%	0%	8%
Fraser Health[e]	**20,860**	**0%**	**0%**	**13%**	**0%**	**0%**	**10%**
Fraser East	3,836	0%	0%	15%	0%	0%	12%
Fraser North	6,970	0%	0%	12%	0%	0%	9%
Fraser South	10,054	0%	0%	13%	0%	0%	9%
Island Health	**6,726**	**0%**	**0%**	**12%**	**2%**	**0%**	**6%**
South Vancouver Island	3,302	0%	0%	8%	1%	0%	6%
Central Vancouver Island	2,354	1%	0%	17%	3%	0%	6%
North Vancouver Island	1,070	1%	0%	13%	3%	0%	8%
Northern Health	**3,299**	**0%**	**0%**	**19%**	**0%**	**0%**	**14%**
Northwest	851	0%	0%	26%	0%	0%	12%
Northern Interior	1,427	0%	0%	16%	0%	0%	10%
Northeast	1,021	0%	0%	18%	0%	0%	22%

Hepatitis B

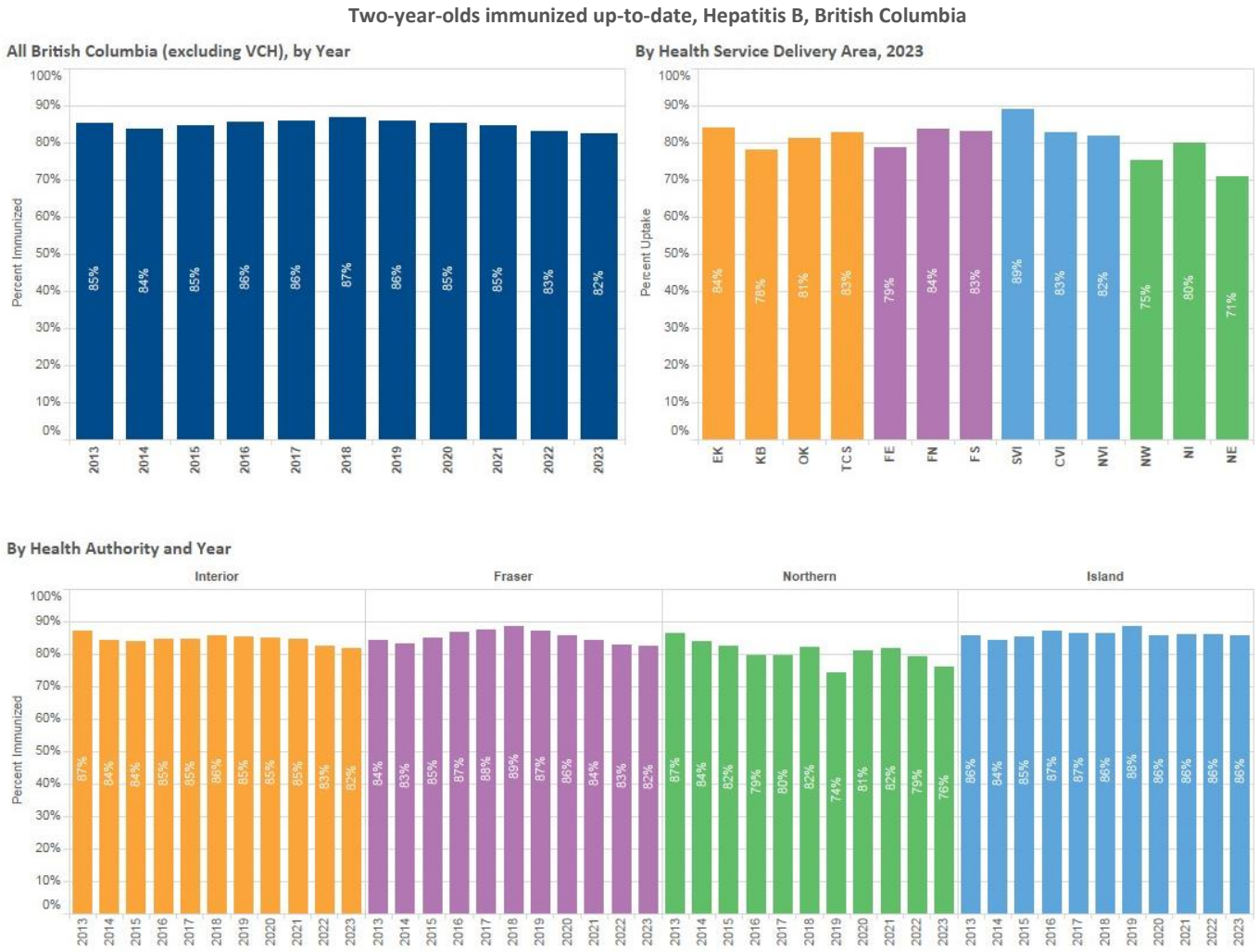


Figure 9. Percent of two-year-olds immunized up-to-date, Hepatitis B, British Columbia

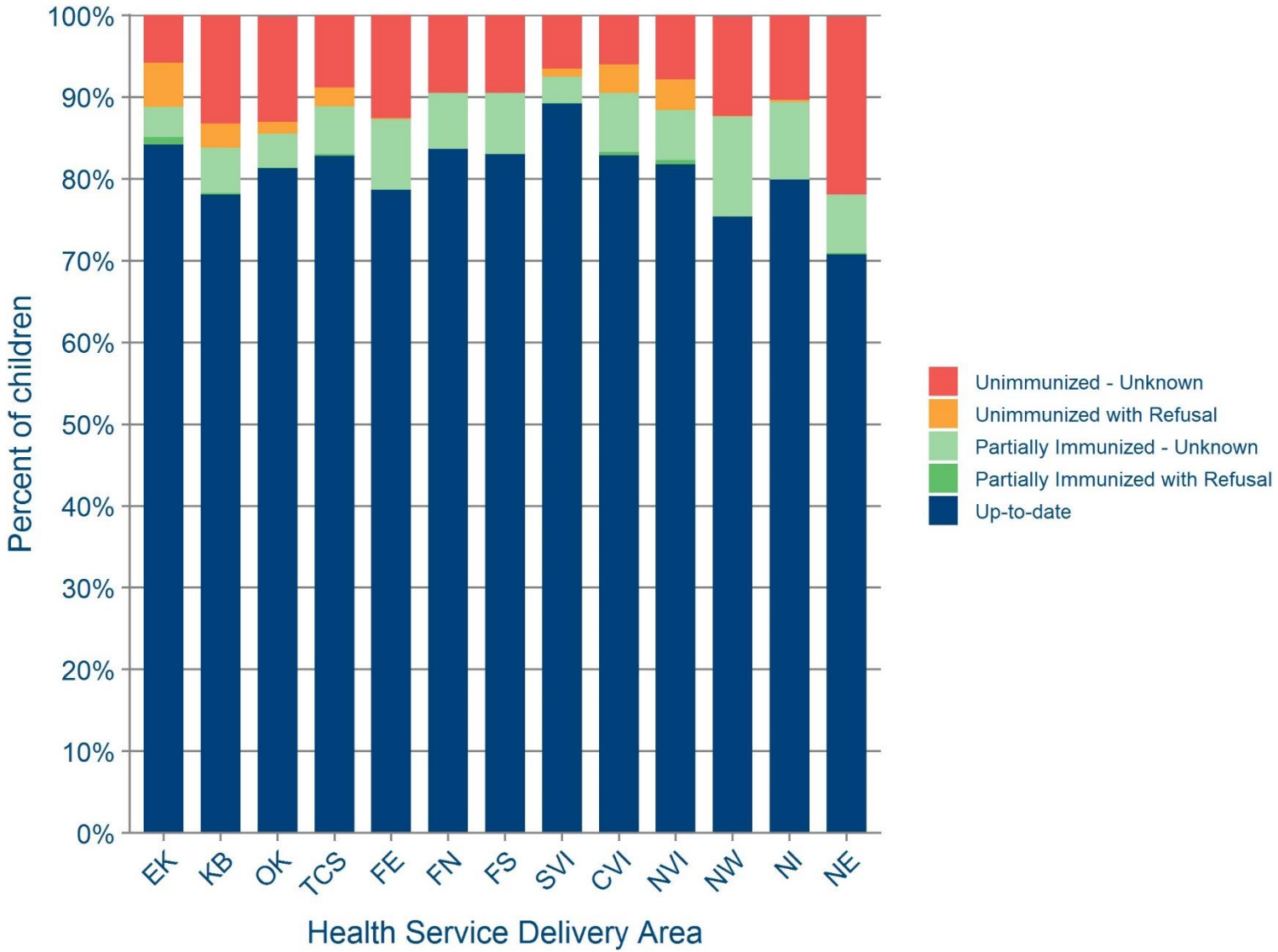


Figure 10. Reasons for non-immunization by Health Service Delivery Area, Hepatitis B, British Columbia, 2023

Table 9. Reasons for non-immunization, Hepatitis B, British Columbia, 2023

Region	Population	Count					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**37**	**0**	**2,534**	**325**	**0**	**3,771**
Interior Health	**6,885**	**17**	**0**	**325**	**160**	**0**	**751**
East Kootenay	765	7	0	28	41	0	45
Kootenay Boundary	598	1	0	33	18	0	79
Okanagan	3,444	5	0	141	53	0	445
Thompson Cariboo Shuswap	2,078	4	0	123	48	0	182
Fraser Health[e]	**20,860**	**1**	**0**	**1,554**	**3**	**0**	**2,107**
Fraser East	3,836	1	0	328	2	0	486
Fraser North	6,970	0	0	476	0	0	663
Fraser South	10,054	0	0	750	1	0	958
Island Health	**6,726**	**18**	**0**	**341**	**157**	**0**	**439**
South Vancouver Island	3,302	3	0	106	34	0	214
Central Vancouver Island	2,354	10	0	170	82	0	141
North Vancouver Island	1,070	5	0	65	41	0	84
Northern Health	**3,299**	**1**	**0**	**314**	**5**	**0**	**474**
Northwest	851	0	0	104	1	0	104
Northern Interior	1,427	0	0	136	4	0	147
Northeast	1,021	1	0	74	0	0	223

Table 9 (continued).

Region	Population	Percent					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**0%**	**0%**	**7%**	**1%**	**0%**	**10%**
Interior Health	**6,885**	**0%**	**0%**	**5%**	**2%**	**0%**	**11%**
East Kootenay	765	1%	0%	4%	5%	0%	6%
Kootenay Boundary	598	0%	0%	6%	3%	0%	13%
Okanagan	3,444	0%	0%	4%	2%	0%	13%
Thompson Cariboo Shuswap	2,078	0%	0%	6%	2%	0%	9%
Fraser Health[e]	**20,860**	**0%**	**0%**	**7%**	**0%**	**0%**	**10%**
Fraser East	3,836	0%	0%	9%	0%	0%	13%
Fraser North	6,970	0%	0%	7%	0%	0%	10%
Fraser South	10,054	0%	0%	8%	0%	0%	10%
Island Health	**6,726**	**0%**	**0%**	**5%**	**2%**	**0%**	**7%**
South Vancouver Island	3,302	0%	0%	3%	1%	0%	6%
Central Vancouver Island	2,354	0%	0%	7%	4%	0%	6%
North Vancouver Island	1,070	0%	0%	6%	4%	0%	8%
Northern Health	**3,299**	**0%**	**0%**	**10%**	**0%**	**0%**	**14%**
Northwest	851	0%	0%	12%	0%	0%	12%
Northern Interior	1,427	0%	0%	10%	0%	0%	10%
Northeast	1,021	0%	0%	7%	0%	0%	22%

Measles, Mumps, and Rubella (MMR)

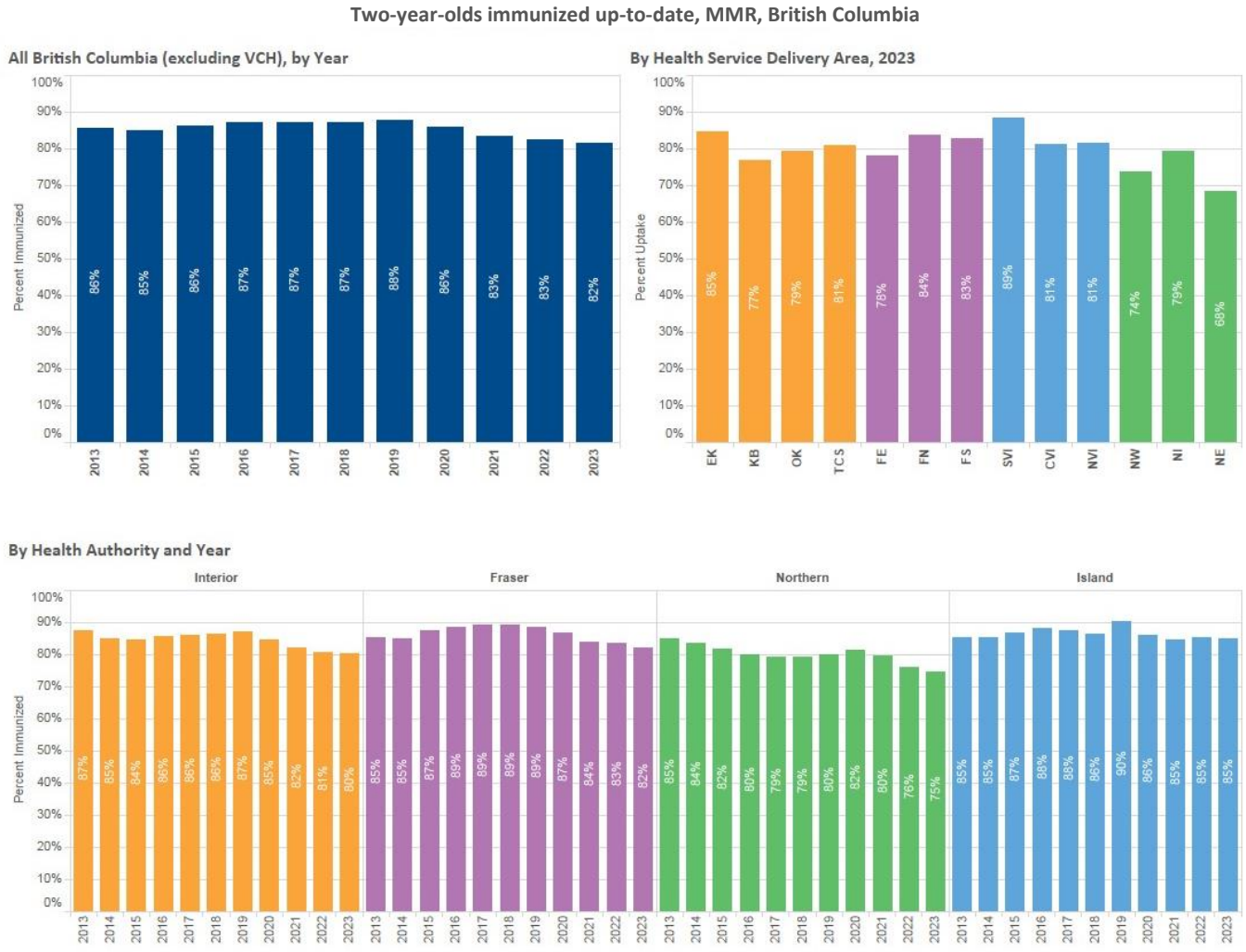


Figure 11. Percent of two-year-olds immunized up-to-date, MMR, British Columbia

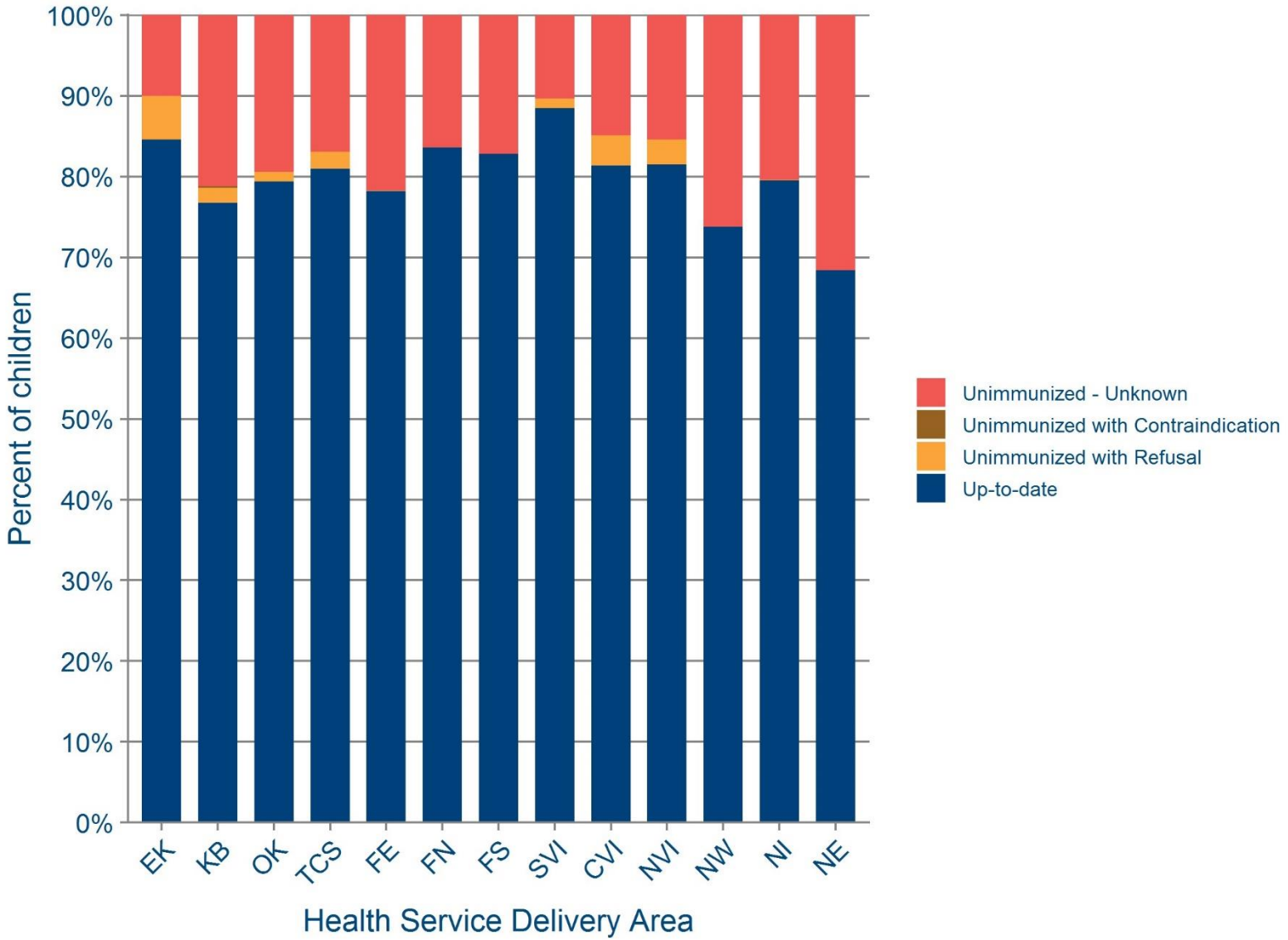


Figure 12. Reasons for non-immunization by Health Service Delivery Area, MMR, British Columbia, 2023

Table 10. Reasons for non-immunization, MMR, British Columbia, 2023

Region	Population	Count			Percent		
		Unimmunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**301**	**2**	**6,622**	**1%**	**0%**	**18%**
Interior Health	**6,885**	**137**	**2**	**1,222**	**2%**	**0%**	**18%**
East Kootenay	765	41	0	77	5%	0%	10%
Kootenay Boundary	598	11	1	127	2%	0%	21%
Okanagan	3,444	41	1	667	1%	0%	19%
Thompson Cariboo Shuswap	2,078	44	0	351	2%	0%	17%
Fraser Health[e]	**20,860**	**4**	**0**	**3,706**	**0%**	**0%**	**18%**
Fraser East	3,836	3	0	835	0%	0%	22%
Fraser North	6,970	0	0	1,142	0%	0%	16%
Fraser South	10,054	1	0	1,729	0%	0%	17%
Island Health	**6,726**	**159**	**0**	**856**	**2%**	**0%**	**13%**
South Vancouver Island	3,302	38	0	341	1%	0%	10%
Central Vancouver Island	2,354	88	0	350	4%	0%	15%
North Vancouver Island	1,070	33	0	165	3%	0%	15%
Northern Health	**3,299**	**1**	**0**	**838**	**0%**	**0%**	**25%**
Northwest	851	0	0	223	0%	0%	26%
Northern Interior	1,427	1	0	292	0%	0%	20%
Northeast	1,021	0	0	323	0%	0%	32%

Meningococcal C Conjugate

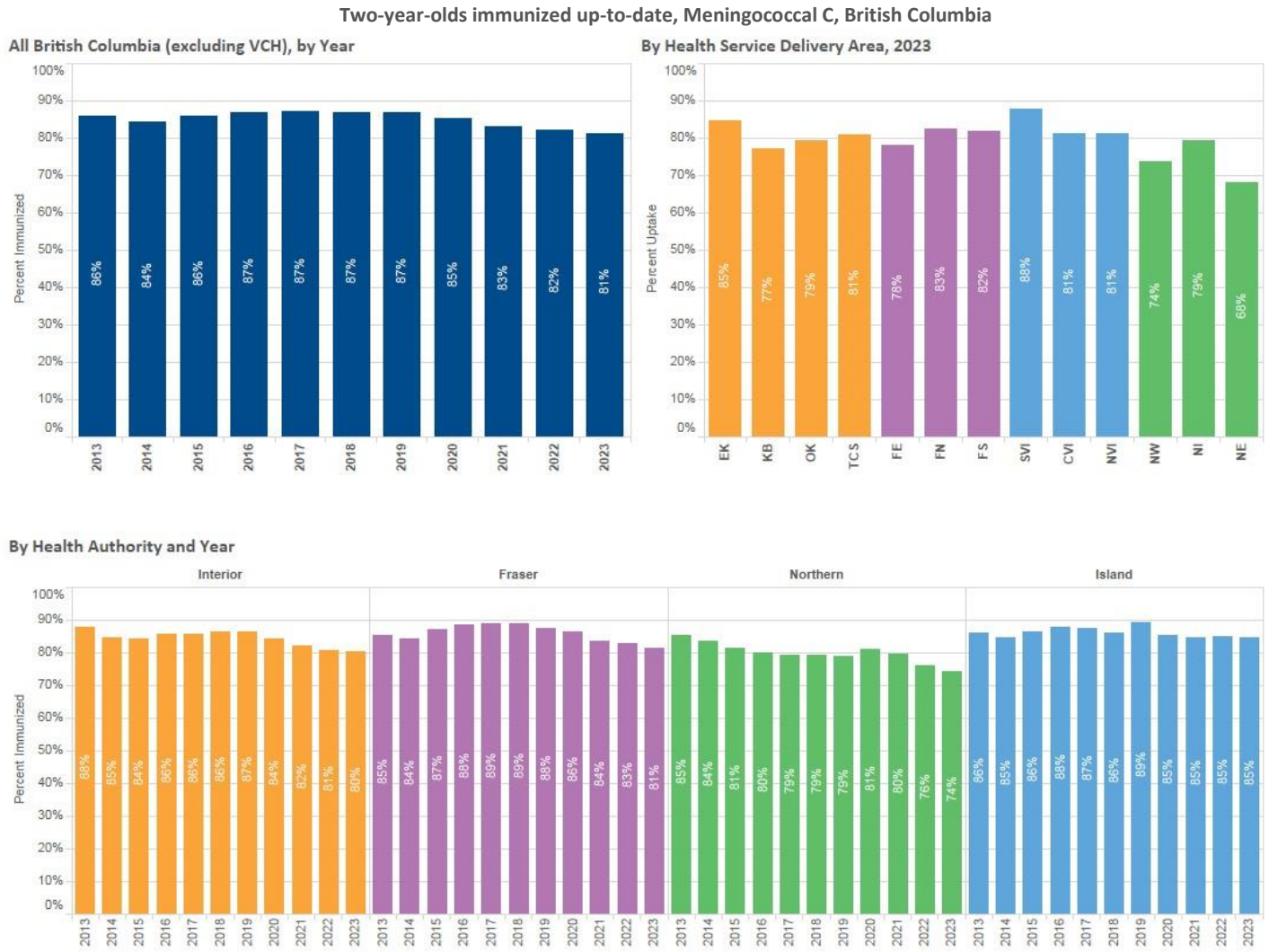


Figure 13. Percent of two-year-olds immunized up-to-date, Meningococcal C, British Columbia

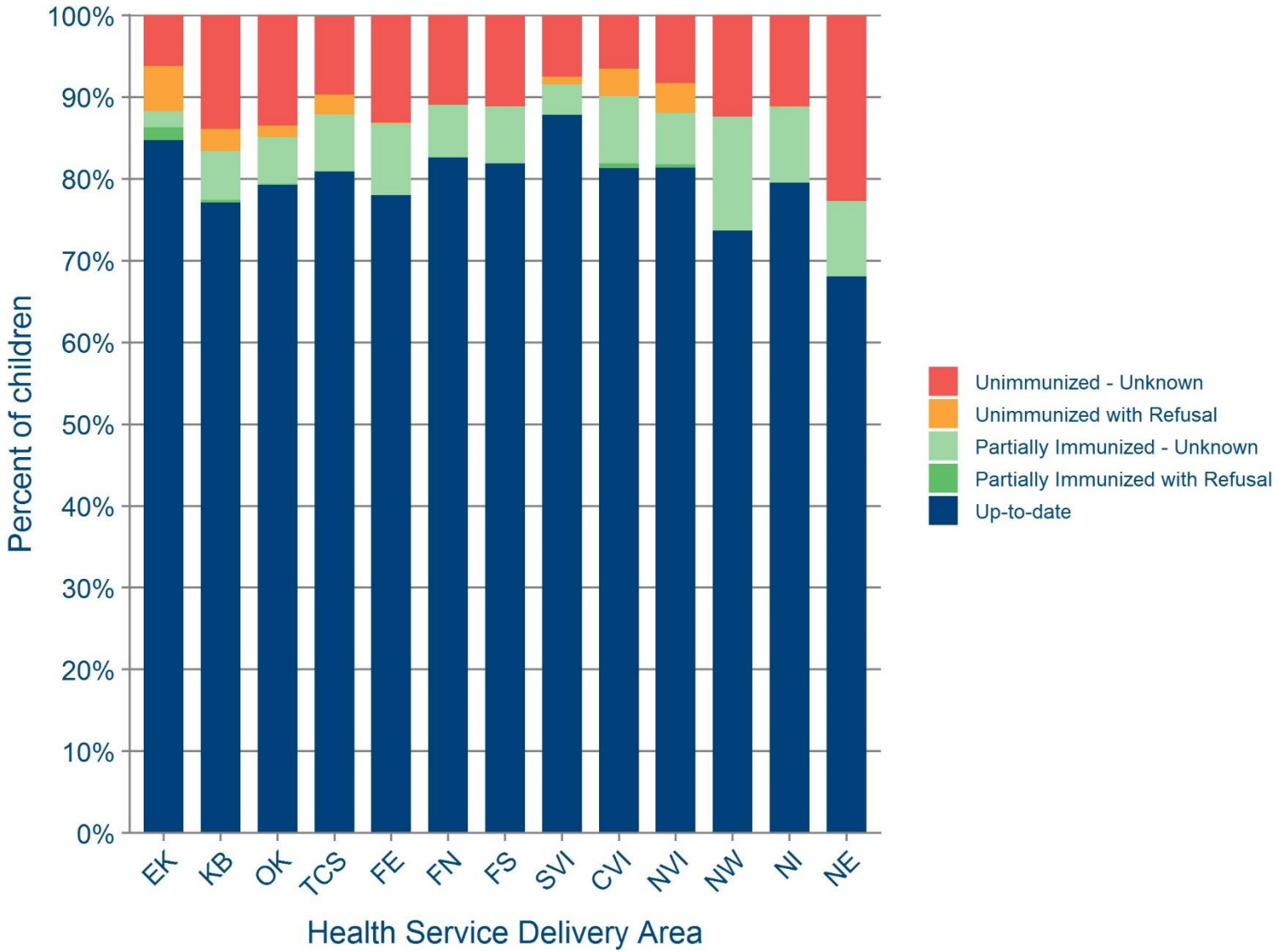


Figure 14. Reasons for non-immunization by Health Service Delivery Area, Meningococcal C, British Columbia, 2023

Table 11. Reasons for non-immunization, Meningococcal C, British Columbia, 2023

Region	Population	Count					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**38**	**0**	**2,611**	**306**	**0**	**4,169**
Interior Health	**6,885**	**17**	**0**	**392**	**155**	**0**	**799**
East Kootenay	765	12	0	15	42	0	48
Kootenay Boundary	598	2	0	36	16	0	83
Okanagan	3,444	2	0	196	47	0	468
Thompson Cariboo Shuswap	2,078	1	0	145	50	0	200
Fraser Health[e]	**20,860**	**0**	**0**	**1,492**	**3**	**0**	**2,382**
Fraser East	3,836	0	0	337	2	0	504
Fraser North	6,970	0	0	450	0	0	766
Fraser South	10,054	0	0	705	1	0	1,112
Island Health	**6,726**	**21**	**0**	**382**	**147**	**0**	**491**
South Vancouver Island	3,302	4	0	122	30	0	246
Central Vancouver Island	2,354	13	0	193	79	0	155
North Vancouver Island	1,070	4	0	67	38	0	90
Northern Health	**3,299**	**0**	**0**	**345**	**1**	**0**	**497**
Northwest	851	0	0	118	0	0	106
Northern Interior	1,427	0	0	133	1	0	159
Northeast	1,021	0	0	94	0	0	232

Table 11 (continued).

Region	Population	Percent					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**0%**	**0%**	**7%**	**1%**	**0%**	**11%**
Interior Health	**6,885**	**0%**	**0%**	**6%**	**2%**	**0%**	**12%**
East Kootenay	765	2%	0%	2%	6%	0%	6%
Kootenay Boundary	598	0%	0%	6%	3%	0%	14%
Okanagan	3,444	0%	0%	6%	1%	0%	14%
Thompson Cariboo Shuswap	2,078	0%	0%	7%	2%	0%	10%
Fraser Health[e]	**20,860**	**0%**	**0%**	**7%**	**0%**	**0%**	**11%**
Fraser East	3,836	0%	0%	9%	0%	0%	13%
Fraser North	6,970	0%	0%	6%	0%	0%	11%
Fraser South	10,054	0%	0%	7%	0%	0%	11%
Island Health	**6,726**	**0%**	**0%**	**6%**	**2%**	**0%**	**7%**
South Vancouver Island	3,302	0%	0%	4%	1%	0%	8%
Central Vancouver Island	2,354	1%	0%	8%	3%	0%	7%
North Vancouver Island	1,070	0%	0%	6%	4%	0%	8%
Northern Health	**3,299**	**0%**	**0%**	**10%**	**0%**	**0%**	**15%**
Northwest	851	0%	0%	14%	0%	0%	12%
Northern Interior	1,427	0%	0%	9%	0%	0%	11%
Northeast	1,021	0%	0%	9%	0%	0%	23%

Pneumococcal Conjugate

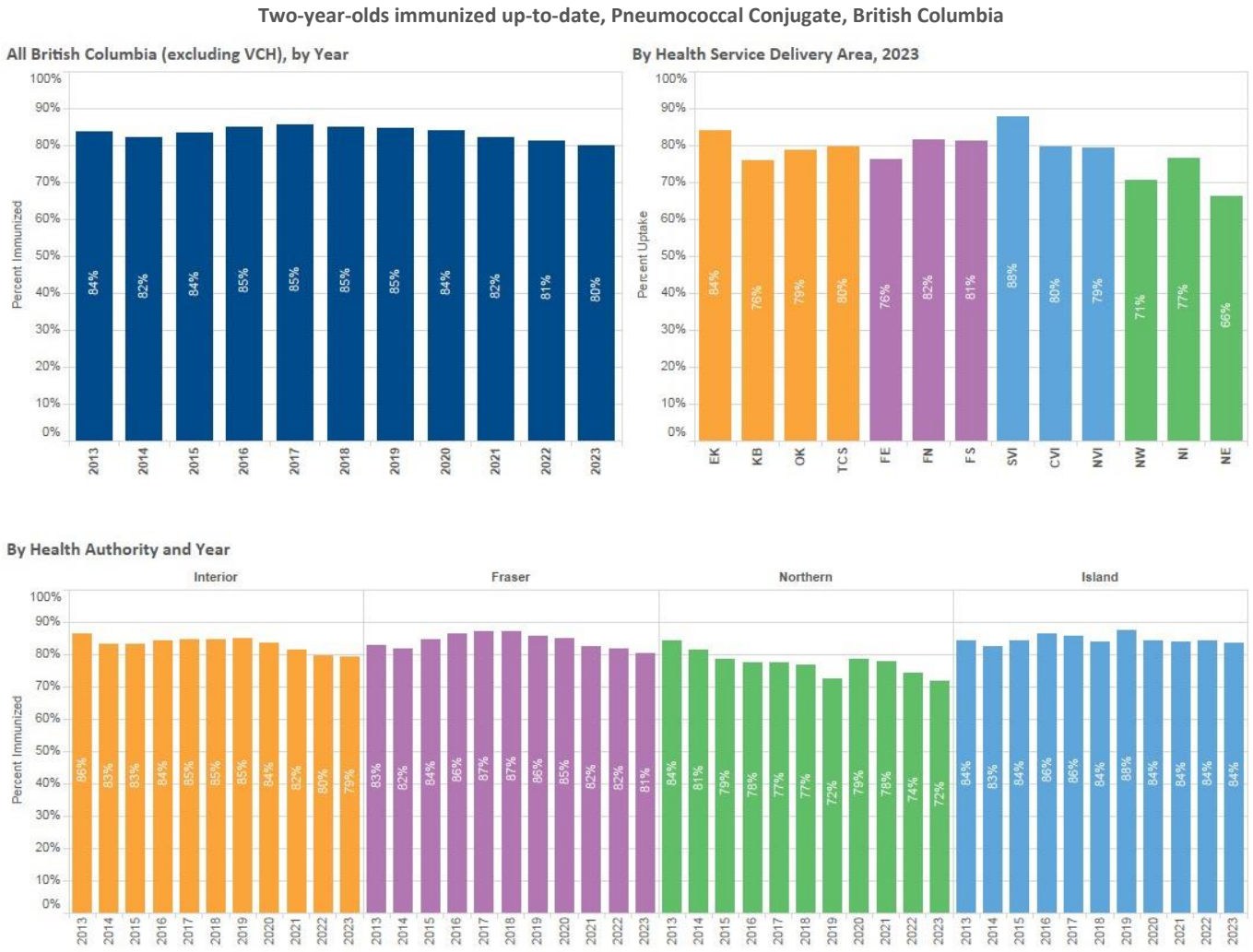


Figure 15. Percent of two-year-olds immunized up-to-date, Pneumococcal Conjugate, British Columbia

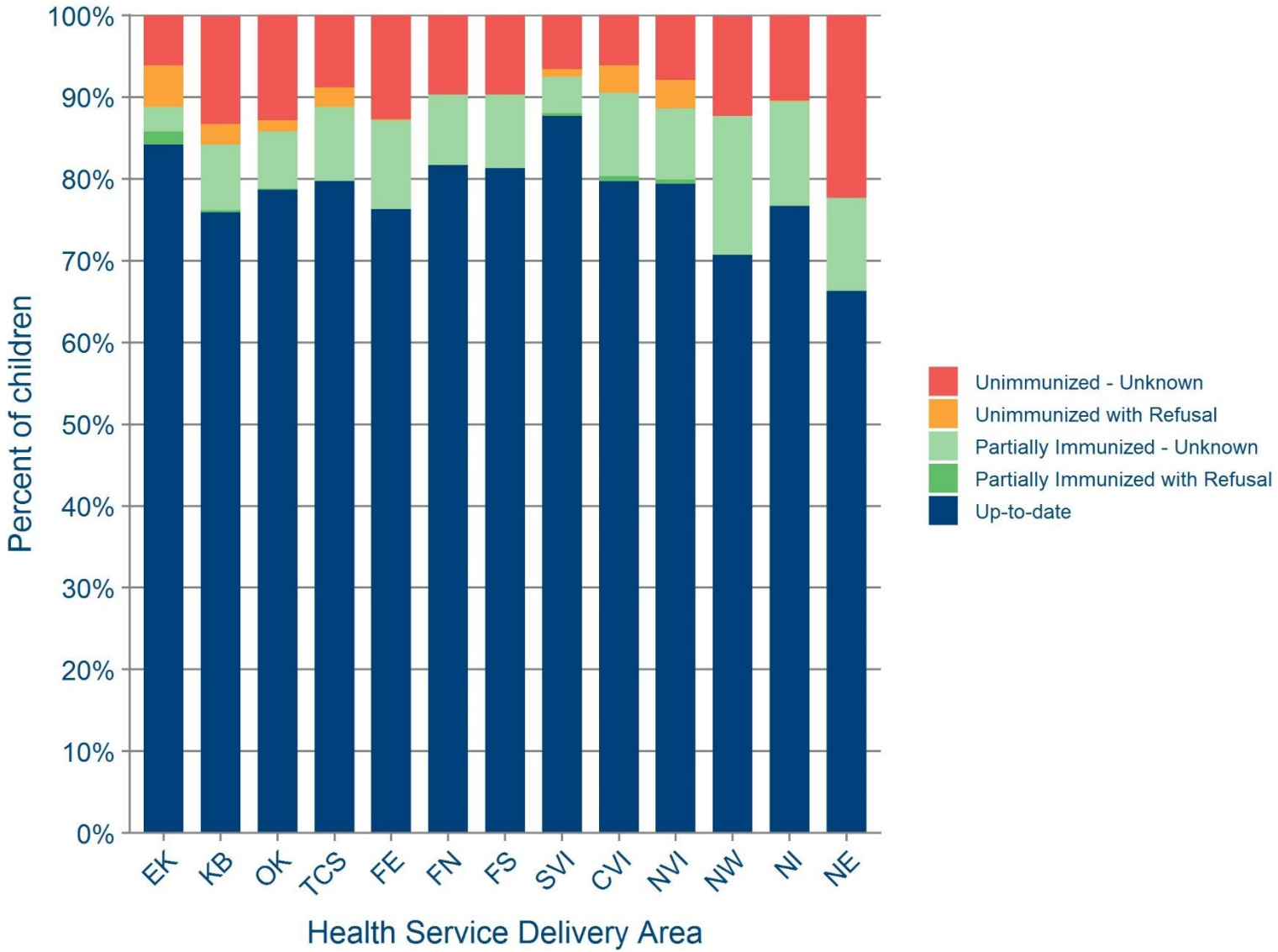


Figure 16. Reasons for non-immunization by Health Service Delivery Area, Pneumococcal Conjugate, British Columbia, 2023

Table 12. Reasons for non-immunization, Pneumococcal conjugate, British Columbia, 2023

Region	Population	Count					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**48**	**0**	**3,353**	**301**	**0**	**3,816**
Interior Health	**6,885**	**20**	**0**	**500**	**150**	**0**	**752**
East Kootenay	765	12	0	23	39	0	47
Kootenay Boundary	598	2	0	48	15	0	79
Okanagan	3,444	3	0	241	47	0	444
Thompson Cariboo Shuswap	2,078	3	0	188	49	0	182
Fraser Health[e]	**20,860**	**0**	**0**	**1,926**	**3**	**0**	**2,135**
Fraser East	3,836	0	0	419	2	0	488
Fraser North	6,970	0	0	602	0	0	674
Fraser South	10,054	0	0	905	1	0	973
Island Health	**6,726**	**28**	**0**	**484**	**147**	**0**	**447**
South Vancouver Island	3,302	10	0	150	30	0	217
Central Vancouver Island	2,354	13	0	241	80	0	145
North Vancouver Island	1,070	5	0	93	37	0	85
Northern Health	**3,299**	**0**	**0**	**443**	**1**	**0**	**482**
Northwest	851	0	0	145	0	0	104
Northern Interior	1,427	0	0	182	1	0	150
Northeast	1,021	0	0	116	0	0	228

Table 12 (continued).

Region	Population	Percent					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**0%**	**0%**	**9%**	**1%**	**0%**	**10%**
Interior Health	**6,885**	**0%**	**0%**	**7%**	**2%**	**0%**	**11%**
East Kootenay	765	2%	0%	3%	5%	0%	6%
Kootenay Boundary	598	0%	0%	8%	2%	0%	13%
Okanagan	3,444	0%	0%	7%	1%	0%	13%
Thompson Cariboo Shuswap	2,078	0%	0%	9%	2%	0%	9%
Fraser Health[e]	**20,860**	**0%**	**0%**	**9%**	**0%**	**0%**	**10%**
Fraser East	3,836	0%	0%	11%	0%	0%	13%
Fraser North	6,970	0%	0%	9%	0%	0%	10%
Fraser South	10,054	0%	0%	9%	0%	0%	10%
Island Health	**6,726**	**0%**	**0%**	**7%**	**2%**	**0%**	**7%**
South Vancouver Island	3,302	0%	0%	4%	1%	0%	7%
Central Vancouver Island	2,354	1%	0%	10%	3%	0%	6%
North Vancouver Island	1,070	0%	0%	9%	4%	0%	8%
Northern Health	**3,299**	**0%**	**0%**	**13%**	**0%**	**0%**	**15%**
Northwest	851	0%	0%	17%	0%	0%	12%
Northern Interior	1,427	0%	0%	13%	0%	0%	10%
Northeast	1,021	0%	0%	11%	0%	0%	22%

Polio

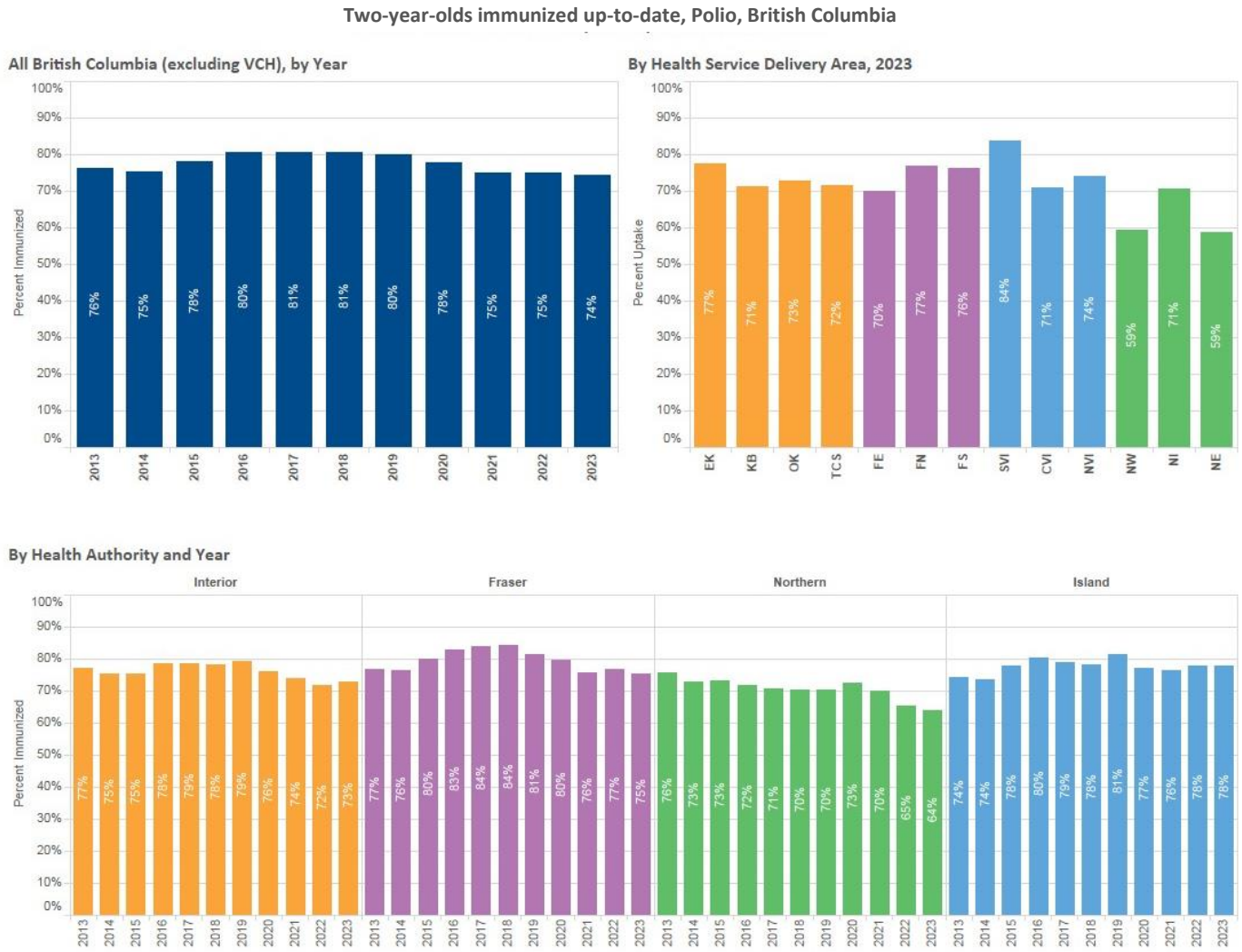


Figure 17. Percent of two-year-olds immunized up-to-date, Polio, British Columbia

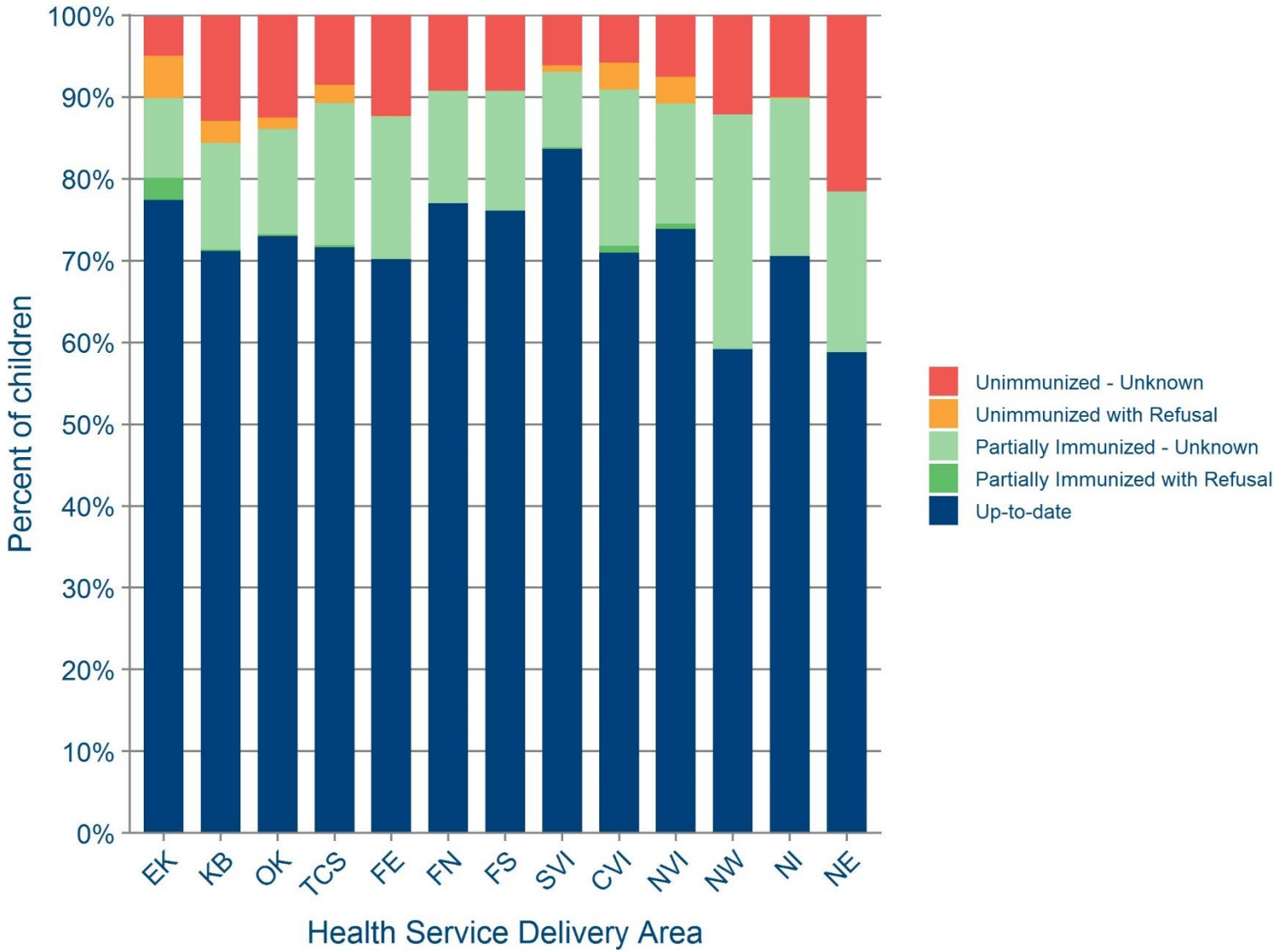


Figure 18. Reasons for non-immunization by Health Service Delivery Area, Polio, British Columbia, 2023

Table 13. Reasons for non-immunization, Polio, British Columbia, 2023

Region	Population	Count					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**65**	**0**	**5,688**	**291**	**0**	**3,662**
Interior Health	**6,885**	**34**	**0**	**957**	**149**	**0**	**726**
East Kootenay	765	21	0	75	40	0	37
Kootenay Boundary	598	1	0	78	16	0	77
Okanagan	3,444	6	0	443	47	0	435
Thompson Cariboo Shuswap	2,078	6	0	361	46	0	177
Fraser Health[e]	**20,860**	**1**	**0**	**3,101**	**3**	**0**	**2,046**
Fraser East	3,836	1	0	667	2	0	475
Fraser North	6,970	0	0	961	0	0	645
Fraser South	10,054	0	0	1,473	1	0	926
Island Health	**6,726**	**30**	**0**	**910**	**138**	**0**	**423**
South Vancouver Island	3,302	5	0	303	26	0	205
Central Vancouver Island	2,354	19	0	450	77	0	137
North Vancouver Island	1,070	6	0	157	35	0	81
Northern Health	**3,299**	**0**	**0**	**720**	**1**	**0**	**467**
Northwest	851	0	0	244	0	0	103
Northern Interior	1,427	0	0	275	1	0	144
Northeast	1,021	0	0	201	0	0	220

Table 13 (continued).

Region	Population	Percent					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**0%**	**0%**	**15%**	**1%**	**0%**	**10%**
Interior Health	**6,885**	**0%**	**0%**	**14%**	**2%**	**0%**	**11%**
East Kootenay	765	3%	0%	10%	5%	0%	5%
Kootenay Boundary	598	0%	0%	13%	3%	0%	13%
Okanagan	3,444	0%	0%	13%	1%	0%	13%
Thompson Cariboo Shuswap	2,078	0%	0%	17%	2%	0%	8%
Fraser Health[e]	**20,860**	**0%**	**0%**	**15%**	**0%**	**0%**	**10%**
Fraser East	3,836	0%	0%	17%	0%	0%	12%
Fraser North	6,970	0%	0%	14%	0%	0%	9%
Fraser South	10,054	0%	0%	15%	0%	0%	9%
Island Health	**6,726**	**0%**	**0%**	**14%**	**2%**	**0%**	**6%**
South Vancouver Island	3,302	0%	0%	9%	1%	0%	6%
Central Vancouver Island	2,354	1%	0%	19%	3%	0%	6%
North Vancouver Island	1,070	1%	0%	15%	3%	0%	8%
Northern Health	**3,299**	**0%**	**0%**	**22%**	**0%**	**0%**	**14%**
Northwest	851	0%	0%	29%	0%	0%	12%
Northern Interior	1,427	0%	0%	19%	0%	0%	10%
Northeast	1,021	0%	0%	20%	0%	0%	22%

Rotavirus[b]

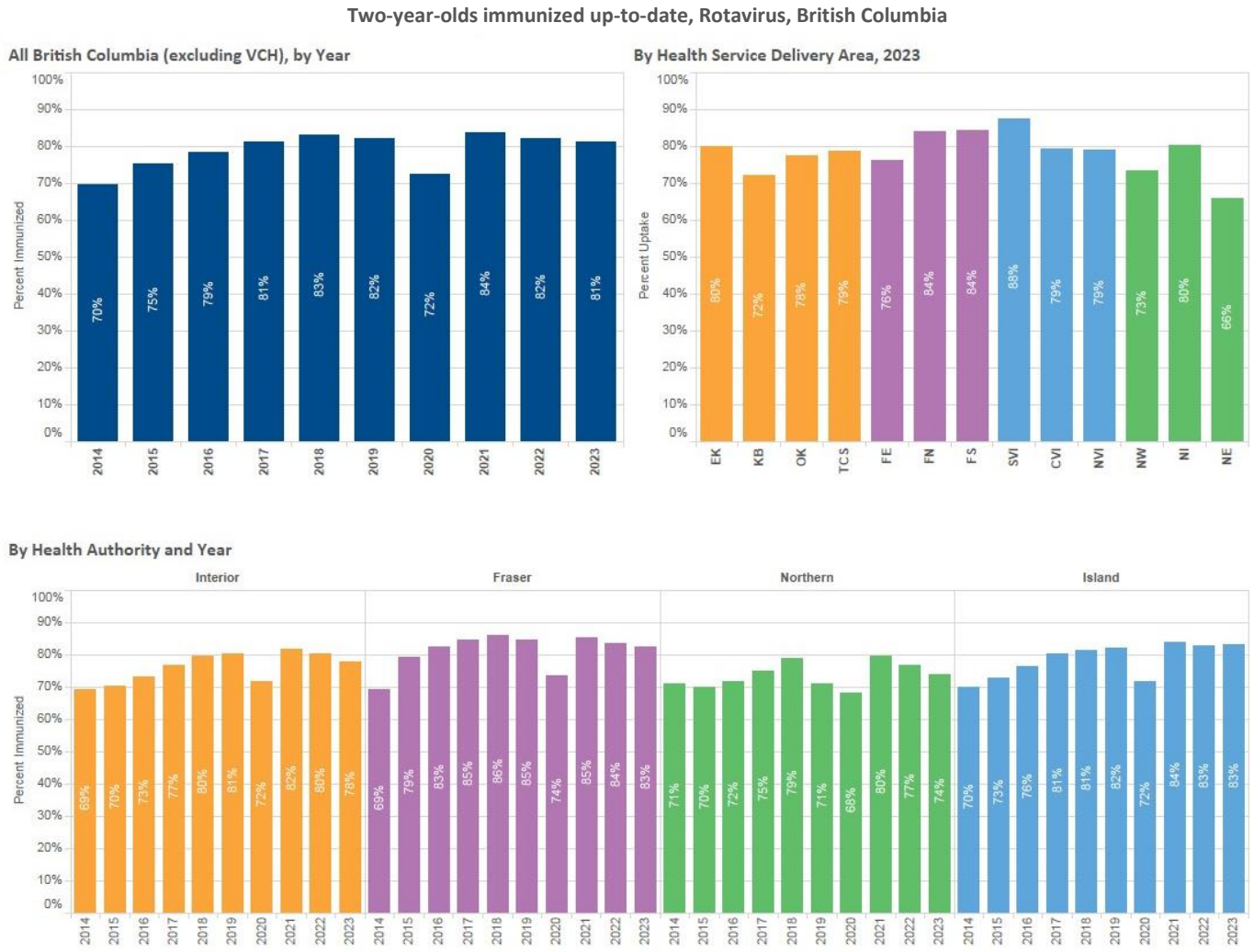


Figure 19. Percent of two-year-olds immunized up-to-date, Rotavirus, British Columbia

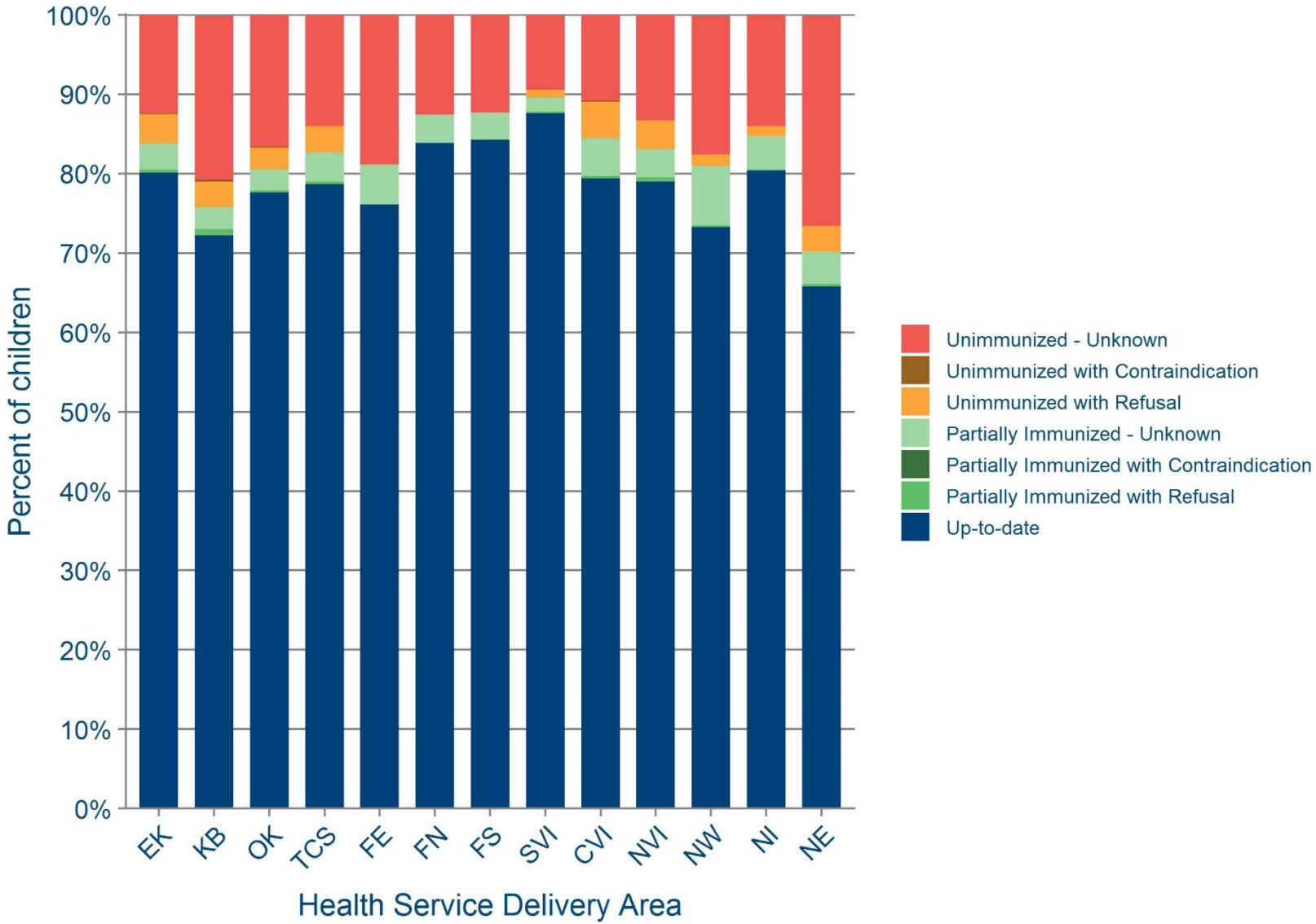


Figure 20. Reasons for non-immunization by Health Service Delivery Area, Rotavirus, British Columbia, 2023

Table 14. Reasons for non-immunization, Rotavirus, British Columbia, 2023

Region	Population	Count					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**53**	**1**	**1,358**	**464**	**8**	**5,241**
Interior Health	**6,885**	**26**	**1**	**208**	**212**	**5**	**1,081**
East Kootenay	765	3	0	25	28	1	95
Kootenay Boundary	598	5	0	17	19	2	123
Okanagan	3,444	12	1	89	97	2	572
Thompson Cariboo Shuswap	2,078	6	0	77	68	0	291
Fraser Health[e]	**20,860**	**2**	**0**	**774**	**7**	**0**	**2,833**
Fraser East	3,836	0	0	190	4	0	722
Fraser North	6,970	1	0	241	2	0	876
Fraser South	10,054	1	0	343	1	0	1,235
Island Health	**6,726**	**19**	**0**	**210**	**182**	**3**	**706**
South Vancouver Island	3,302	8	0	58	34	1	309
Central Vancouver Island	2,354	6	0	113	109	2	255
North Vancouver Island	1,070	5	0	39	39	0	142
Northern Health	**3,299**	**6**	**0**	**166**	**63**	**0**	**621**
Northwest	851	2	0	64	12	0	149
Northern Interior	1,427	1	0	60	18	0	201
Northeast	1,021	3	0	42	33	0	271

Table 14 (continued).

Region	Population	Percent					
		Partially Immunized			Unimmunized		
		Refusal	Contraindication	Unknown[d]	Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**0%**	**0%**	**4%**	**1%**	**0%**	**14%**
Interior Health	**6,885**	**0%**	**0%**	**3%**	**3%**	**0%**	**16%**
East Kootenay	765	0%	0%	3%	4%	0%	12%
Kootenay Boundary	598	1%	0%	3%	3%	0%	21%
Okanagan	3,444	0%	0%	3%	3%	0%	17%
Thompson Cariboo Shuswap	2,078	0%	0%	4%	3%	0%	14%
Fraser Health[e]	**20,860**	**0%**	**0%**	**4%**	**0%**	**0%**	**14%**
Fraser East	3,836	0%	0%	5%	0%	0%	19%
Fraser North	6,970	0%	0%	4%	0%	0%	13%
Fraser South	10,054	0%	0%	3%	0%	0%	12%
Island Health	**6,726**	**0%**	**0%**	**3%**	**3%**	**0%**	**10%**
South Vancouver Island	3,302	0%	0%	2%	1%	0%	9%
Central Vancouver Island	2,354	0%	0%	5%	5%	0%	11%
North Vancouver Island	1,070	0%	0%	4%	4%	0%	13%
Northern Health	**3,299**	**0%**	**0%**	**5%**	**2%**	**0%**	**19%**
Northwest	851	0%	0%	8%	1%	0%	18%
Northern Interior	1,427	0%	0%	4%	1%	0%	14%
Northeast	1,021	0%	0%	4%	3%	0%	26%

Varicella

Figure 21. Percent of two-year-olds up-to-date, Varicella, British Columbia

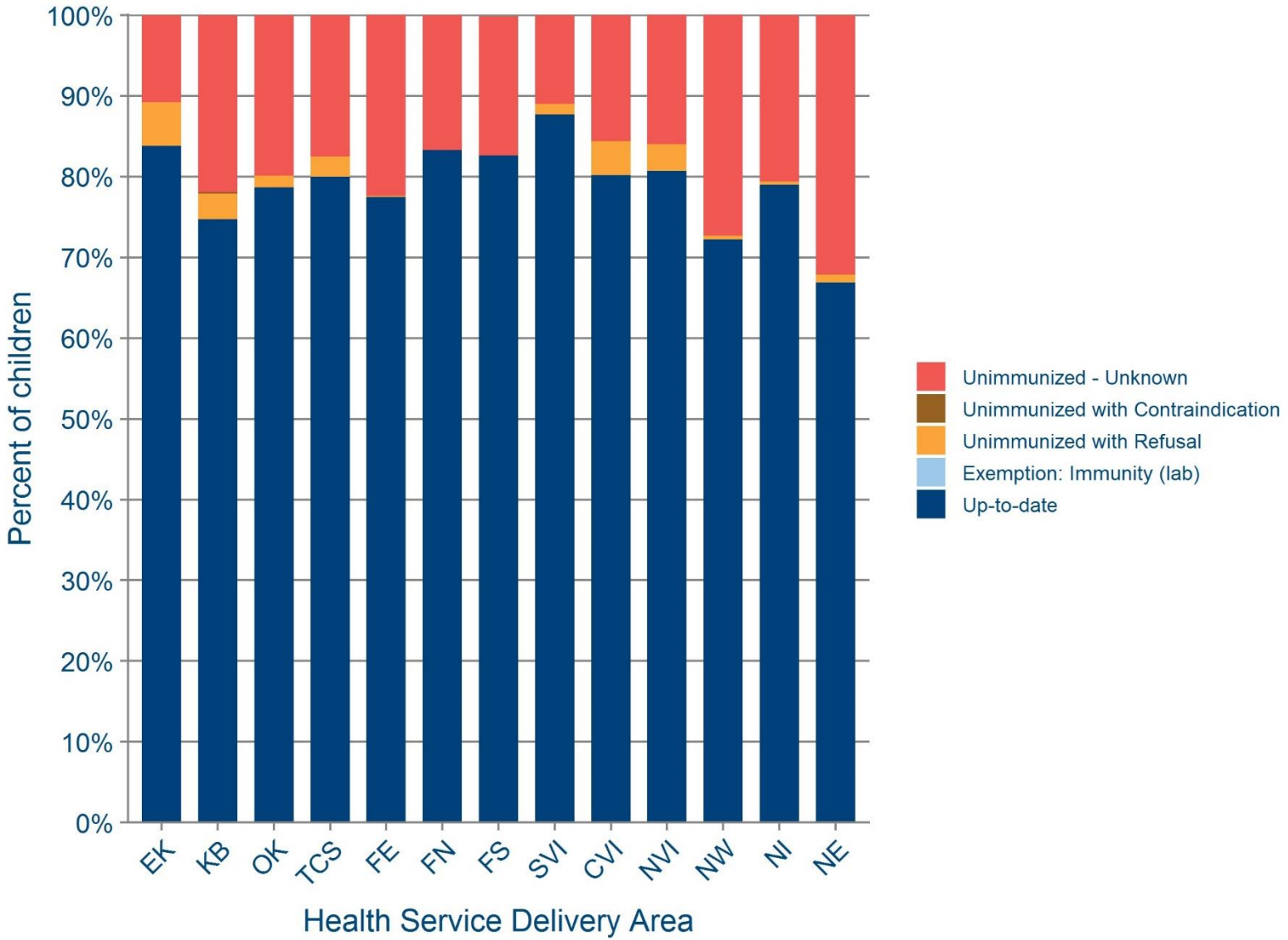


Figure 22. Reasons for non-immunization by Health Service Delivery Area, Varicella, British Columbia, 2023

Table 15. Reasons for non-immunization, Varicella, British Columbia, 2023

Region	Population	Count				
		Immune: Previous Disease	Immune: Lab Evidence	Unimmunized		
				Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**0**	**1**	**359**	**2**	**6,790**
Interior Health	**6,885**	**0**	**1**	**160**	**2**	**1,262**
East Kootenay	765	0	0	41	0	83
Kootenay Boundary	598	0	0	19	1	131
Okanagan	3,444	0	0	49	1	685
Thompson Cariboo Shuswap	2,078	0	1	51	0	363
Fraser Health[e]	**20,860**	**0**	**0**	**5**	**0**	**3,770**
Fraser East	3,836	0	0	3	0	862
Fraser North	6,970	0	0	0	0	1,165
Fraser South	10,054	0	0	2	0	1,743
Island Health	**6,726**	**0**	**0**	**175**	**0**	**903**
South Vancouver Island	3,302	0	0	42	0	363
Central Vancouver Island	2,354	0	0	98	0	368
North Vancouver Island	1,070	0	0	35	0	172
Northern Health	**3,299**	**0**	**0**	**19**	**0**	**855**
Northwest	851	0	0	4	0	233
Northern Interior	1,427	0	0	5	0	294
Northeast	1,021	0	0	10	0	328

Table 15 (continued).

Region	Population	Percent				
		Immune: Previous Disease	Immune: Lab Evidence	Unimmunized		
				Refusal	Contraindication	Unknown[d]
British Columbia - excluding VCH	**37,770**	**0%**	**0%**	**1%**	**0%**	**18%**
Interior Health	**6,885**	**0%**	**0%**	**2%**	**0%**	**18%**
East Kootenay	765	0%	0%	5%	0%	11%
Kootenay Boundary	598	0%	0%	3%	0%	22%
Okanagan	3,444	0%	0%	1%	0%	20%
Thompson Cariboo Shuswap	2,078	0%	0%	2%	0%	18%
Fraser Health[e]	**20,860**	**0%**	**0%**	**0%**	**0%**	**18%**
Fraser East	3,836	0%	0%	0%	0%	22%
Fraser North	6,970	0%	0%	0%	0%	17%
Fraser South	10,054	0%	0%	0%	0%	17%
Island Health	**6,726**	**0%**	**0%**	**3%**	**0%**	**13%**
South Vancouver Island	3,302	0%	0%	1%	0%	11%
Central Vancouver Island	2,354	0%	0%	4%	0%	16%
North Vancouver Island	1,070	0%	0%	3%	0%	16%
Northern Health	**3,299**	**0%**	**0%**	**1%**	**0%**	**26%**
Northwest	851	0%	0%	0%	0%	27%
Northern Interior	1,427	0%	0%	0%	0%	21%
Northeast	1,021	0%	0%	1%	0%	32%

Data Sources

Coverage estimates are based on immunization and client records in the Provincial Immunization Registry (PIR). Coverage presented in this report is based on reporting in PIR to January 15, 2024.

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.

Up-to-date for age definitions

Estimates reported for any given year reflect coverage among children who turned two years old during that calendar year (e.g., 2023 results are for children born in 2021). Only doses given prior to the second birthday are included in this assessment.

Numerators: Number of children with active records in PIR who turned two in the year reported and are up-to-date for the specified agent(s) by age two in Interior Health, Island Health, Fraser Health, and Northern Health

Denominators: Number of children with active records in PIR who turned two in the year reported in Interior Health, Island Health, Fraser Health, and Northern Health

Measure	Definition
Up to date for age (UTD)[f]	Meets the up-to-date definitions for DTaP-IPV-Hib, hepatitis B, meningococcal C, MMR, pneumococcal conjugate, and varicella outlined below.
Up-to-date for age minus booster (UTD-MB)	Meets the up-to-date definitions for hepatitis B, meningococcal C, MMR, pneumococcal conjugate, and varicella outlined below; 3 doses diphtheria/tetanus/pertussis, 2 doses polio, at least 1 dose of *Haemophilus influenzae* type b
DTaP-IPV	4 doses diphtheria/tetanus/pertussis, 3 doses polio
DTaP-IPV-Hib	4 doses diphtheria/tetanus/pertussis, 3 doses polio, up-to-date for *Haemophilus influenzae* type b as defined below
Haemophilus influenzae type b (Hib)[g]	If dose 1 before 15 months of age: at least 2 doses of Hib vaccine with last dose on or after 12 months of age. If dose 1 on or after 15 months of age: 1 dose of Hib vaccine.
Hepatitis B	3 doses hepatitis B vaccine with 3rd dose on or after 24 weeks of age
Meningococcal C	At least 1 dose of meningococcal C conjugate on or after 12 months of age. For children who receive quadrivalent meningococcal conjugate vaccine, 1-2 doses on or after 12 months of age depending on age at first dose.
MMR	1 dose measles/mumps/rubella
Pneumococcal conjugate	If dose 1 before 12 months of age: 3 doses pneumococcal conjugate with 3rd dose on or after 12 months of age. If dose 1 between 12 and 23 months of age: 2 doses pneumococcal conjugate
Polio	3 doses polio

[f] Rotavirus is excluded from UTD definition as the last dose must be administered by 8 months plus 0 days of age, therefore there is no opportunity for catchup after this age.

[g] Starting in the 2015 report, a Hib booster dose is considered valid when given as early as 12 months of age. See Notes.

Rotavirus[h]	2 doses of rotavirus vaccine
Varicella	1 dose of varicella on or after 12 months of age 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. 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 past history of varicella disease recorded in PIR is considered protected, regardless of their age at the time of illness.
No immunizations recorded	No record of doses administered prior to 2 years of age for all of the following antigens: diphtheria/tetanus/pertussis, *Haemophilus influenzae* type b, hepatitis B, measles, meningococcal C, mumps, pneumococcal conjugate, polio, rotavirus, rubella, and varicella.
Refusal to all	Documented refusals to all of the following antigens: diphtheria/tetanus/pertussis, *Haemophilus influenzae* type b, hepatitis B, measles, meningococcal C, mumps, pneumococcal conjugate, polio, rotavirus, rubella, and varicella. Refusals effective any time on or before the 2nd birthday are counted, regardless of a documented end date. As of 2018, only children with documented refusals *and* no immunizations recorded are counted.

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 Ages and Intervals Between Doses.

[h] 3 doses were required for the 2018 birth cohort (2020 report). See Notes.

Reasons for non-immunization definitions

Measure	Definition
Exemption: Lab Evidence of Immunity	*For varicella only.* Does not meet criteria for Up-to-Date AND Type of Special Consideration = Exemption AND Reason for Special Consideration = Immunity - Lab Evidence AND Special Consideration Effective From Date <= Milestone Date[i] AND Special Consideration Effective To Date > Milestone Date[i] OR <blank>
Exemption: Previous Disease (varicella)	*For varicella only* Does not meet any of the previous definitions AND Type of Special Consideration = Exemption AND Reason for Special Consideration = Immunity - Previous Disease AND Special Consideration Effective From Date <= Milestone Date[i] AND Special Consideration Effective To Date > Milestone Date[i] OR <blank>
Partially Immunized with Contraindication	*For agents/antigens requiring more than one dose.* 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 <= Milestone Date[i] AND Special Consideration Effective To Date > Milestone Date[i] OR <blank>
Partially Immunized with Refusal	*For agents/antigens requiring more than one dose.* 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 <= Milestone Date[i]
Partially Immunized - Unknown	*For agents/antigens requiring more than one dose.* Does not meet any of the previous definitions AND Received at least one valid dose of the agent/antigen of interest **Note:** 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 agent/antigen of interest; or no recorded refusals, exemptions, or contraindications for any agent/antigen.

[i] 2nd birthday minus one day

Measure	Definition
Unimmunized with Contraindication	Does not meet any of the previous definitions AND Has no recorded valid doses 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 <= Milestone Date[i] AND Special Consideration Effective To Date > Milestone Date[i] OR <blank>
Unimmunized with Refusal	Does not meet any of the previous definitions AND Has no recorded valid doses 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 <= Milestone Date[i]
Unimmunized - Unknown	Does not meet any of the previous definitions AND Has no recorded valid doses of the agent/antigen of interest **Note:** 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.

Minimum Ages and Intervals Between Doses

Antigen/Agent	Dose 1 [A]	Dose 2	Dose 3	Dose 4
Diphtheria, Tetanus, acellular Pertussis (DTaP)	42 days	28 days	28 days	24 weeks
Polio [B]	42 days	28 days	24 weeks	
Hepatitis B				
received 3rd dose between June 2007 and May 2014	0 days	28 days	56 days [C]	
received 3rd dose in June 2014 or later	0 days	28 days	56 days [C,D]	
Measles, Mumps, Rubella	12 months			
Varicella	12 months			
Meningococcal-C Conjugate				
meningococcal-C conjugate vaccine [E] or quadrivalent meningococcal vaccine (Nimenrix®)	12 months			
quadrivalent meningococcal vaccine (Menveo®), initial dose before 12 months of age	8 weeks	8 weeks	8 weeks [F]	
quadrivalent meningococcal vaccine (Menveo®), initial dose on or after 12 months of age	12 months	8 weeks		
Haemophilus influenzae, type b				
initial dose before 15 months of age	42 days	8 weeks [G]		
initial dose on or after 15 months of age	15 months			
Pneumococcal Conjugate				
initial dose before 12 months of age	42 days	28 days	56 days [F]	
initial dose between 12 and 23 months of age	12-23 months	56 days		
Rotavirus	42 days	28 days		

A. Dose 1 refers to the earliest age a child can receive the initial dose.
B. Schedule for DTaP should be followed when poliomyelitis provided in combination vaccine.
C. Dose 3 must be given at least 16 weeks after dose 1 and 8 weeks after dose 2.
D. Dose 3 must be given on or after 24 weeks of age.
E. Dose must be given at least 8 weeks after any previous meningococcal C conjugate dose (if previous dose given).
F. Dose 3 must be given on or after 12 months of age.
G. The booster dose may be given as early as 12 months of age.

Two-year-olds with Up-to-date Immunizations by Health Authority and Health Service Delivery Area, Vancouver Coastal Health

Health Authority / HSDA	Vaccination Details	Year			
		Children born in 2006	Children born in 2009	Children born in 2012	Children born in 2015
Vancouver Coastal Health	**Up-to-date for age**	**77%**	**65%**	**69%**	**75%**
	Up-to-date minus the booster	**78%**	**72%**	**70%**	**77%**
	Specific Agents				
VCH	DTaP-IPV	87%	80%	81%	84%
	DTaP-IPV-Hib	86%	80%	81%	84%
	Hepatitis B	93%	81%	85%	90%
	Hib	90%	84%	85%	88%
	MMR	87%	78%	93%	95%
	Polio	89%	83%	84%	88%
	Varicella	92%	87%	90%	94%
	Pneumococcal conjugate	88%	86%	88%	97%
	Meningococcal C	93%	89%	90%	94%
	Rotavirus	n/a	n/a	84%	91%
Richmond	**Up-to-date for age**	**85%**	**71%**	**72%**	**76%**
	Up-to-date minus the booster	**85%**	**77%**	**72%**	**78%**
	Specific Agents				
RICH	DTaP-IPV	93%	85%	87%	86%
	DTaP-IPV-Hib	93%	85%	86%	86%
	Hepatitis B	96%	86%	86%	90%
	Hib	95%	89%	89%	89%
	MMR	93%	83%	94%	96%
	Polio	94%	88%	89%	89%
	Varicella	94%	91%	92%	94%
	Pneumococcal conjugate	90%	88%	87%	97%
	Meningococcal C	94%	91%	90%	94%
	Rotavirus	n/a	n/a	88%	94%
Vancouver	**Up-to-date for age**	**69%**	**63%**	**72%**	**76%**
	Up-to-date minus the booster	**71%**	**70%**	**73%**	**78%**
	Specific Agents				
VAN	DTaP-IPV	80%	82%	84%	85%
	DTaP-IPV-Hib	79%	82%	83%	85%
	Hepatitis B	91%	79%	85%	91%
	Hib	85%	86%	86%	90%
	MMR	82%	79%	95%	95%
	Polio	83%	86%	85%	88%
	Varicella	90%	87%	91%	92%
	Pneumococcal conjugate	85%	84%	89%	96%
	Meningococcal C	92%	89%	90%	92%
	Rotavirus	n/a	n/a	85%	90%

Health Authority / HSDA	Vaccination Details	Year			
		Children born in 2006	Children born in 2009	Children born in 2012	Children born in 2015
North Shore (Coastal Urban)	**Up-to-date for age**	**82%**	**61%**	**69%**	**69%**
	Up-to-date minus the booster	**83%**	**70%**	**70%**	**71%**
	Specific Agents				
	DTaP-IPV	92%	76%	80%	83%
	DTaP-IPV-Hib	92%	76%	80%	82%
	Hepatitis B	94%	76%	85%	87%
	Hib	93%	80%	85%	87%
	MMR	90%	76%	95%	95%
	Polio	93%	80%	84%	87%
	Varicella	94%	86%	92%	94%
	Pneumococcal conjugate	91%	86%	88%	96%
	Meningococcal C	94%	88%	93%	94%
	Rotavirus	n/a	n/a	85%	92%
Coast Garibaldi (Coastal Rural)	**Up-to-date for age**	**79%**	**65%**	**64%**	**78%**
	Up-to-date minus the booster	**79%**	**74%**	**65%**	**80%**
	Specific Agents				
	DTaP-IPV	88%	74%	71%	83%
	DTaP-IPV-Hib	88%	74%	71%	83%
	Hepatitis B	88%	81%	82%	94%
	Hib	89%	80%	77%	87%
	MMR	87%	74%	87%	94%
	Polio	88%	77%	75%	87%
	Varicella	87%	83%	84%	93%
	Pneumococcal conjugate	88%	84%	86%	97%
	Meningococcal C	90%	86%	88%	95%
	Rotavirus	n/a	n/a	77%	86%

Data sources:

Vancouver Coastal Health Authority, Vaccine Evaluation Centre, 2015 Cohort Two-Year-Old Immunization Coverage Survey,
Vancouver Coastal Health Authority and Fraser Health Authority, 2012 Cohort Two-Year-Old Immunization Coverage Survey
Vancouver Coastal Health Authority and Fraser Health Authority, 2009 Cohort Two-Year-Old Immunization Coverage Survey.
Vancouver Coastal Health and Vaccine Evaluation Centre, 2006 Cohort Two-Year-Old Immunization Coverage Surveys.
Prepared by: Vancouver Coastal Health, Public Health Surveillance Unit, October 2012, September 2015 and February 2022.

2015 coverage rates are based on respondents from a random sample generated by the Ministry of Health. 2009 and 2012 coverage rates are based on a random sample from total surveys completed; and 2006 was based on a random sample generated by Ministry of Health but follow-up was prioritized for those with existing records in iPHIS or PARIS. This may have led to an overestimation of coverage for that birth cohort.

The following VCH coverage definitions differed from those applied for the other health authorities. See Up-to-date for Age Definitions for further information on the provincial coverage rules.
Varicella - 1 dose of varicella on or after 12 months of age.
Haemophilus influenzae – At least 1 dose *Haemophilus influenzae* type b on or after 15 months of age
Rotavirus – 2 doses of rotavirus where first dose is given on 42 - 139 days of age, and second dose given 28 days after the first dose and on or before 8 months of age.
The remaining up-to-date definitions for the 2015 birth cohort are consistent.

Notes

1. VCH provides their early childhood coverage data through a separate mechanism. Two-year-old immunization coverage data for VCH have not been included with provincial data because VCH data (based on periodic surveys of a sample of the population) may not be comparable with population-based immunization data obtained from PIR for the rest of the province. While immunizations provided to infants by public health in VCH are captured in the health authority's electronic information system (called PARIS), the majority of VCH infants are immunized by physicians. BC's public health legislation does not require reporting of immunizations administered physicians to public health; thus, immunizations delivered by physicians are not systematically captured in PARIS. VCH examines early childhood immunization coverage data through periodic coverage studies. Coverage studies have been conducted for the 2003, 2006, 2009, 2012 and 2015 birth cohorts. Due to the pandemic, the next coverage study is planned for the 2020 birth cohort. From 2013 to 2022, VCH represented approximately 21% of BC's two-year-old population (Source: BC Stats Population Estimates and PEOPLE projections). See: Two-year-olds with Up-to-date Immunizations by Health Authority and Health Service Delivery Area, Vancouver Coastal Health.
2. Two errors in the code used to analyze two-year-old immunization coverage were identified in the spring of 2023. These errors affected the 2019-2022 reports (2017-2020 birth cohorts). The errors were rectified for the 2021 and 2022 reports but have not been corrected in the 2019 or 2020 reports.
    a. The term "up-to-date minus booster" (UTDMB) is defined as a child who is up-to-date for all recommended routine immunizations by age two except for the 18-month booster dose of DTaP-IPV-Hib. The code erroneously assessed some children as UTDMB even if they were not up-to-date for non-booster antigens (hepatitis B, meningococcal C, MMR, pneumococcal conjugate, and varicella). However, since most vaccinated children are receiving all recommended vaccines, re-analysis after correcting the error for the 2022 report (2020 birth cohort) found that the UTDMB rate was only 2.4% lower at the provincial level.
    b. *Haemophilus influenzae* type b coverage was miscalculated. This vaccine, like pneumococcal conjugate, requires a reduced dose schedule for children previously unvaccinated as they age through the first two years of life. These modifications for delayed commencement, with reduced dosing requirements, were not built into the code and stricter rules based on age at initial dose receipt were applied. Since most children were already considered up-to-date based on receipt of one dose on or after 15 months of age, re-analysis after correcting the error for the 2022 report (2020 birth cohort) found that Hib coverage was 1% higher at the provincial level.
3. Due to ongoing development of the interface between the FH information system and 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 children with unknown reasons for non-immunization is likely to be overestimated. The number of children partially immunized or unimmunized due to refusals or contraindications, as well as the number of children with protection against varicella due to previous infection and/or lab evidence of immunity would be underestimated.
4. 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.

5. Rotarix® (2-dose series) was the rotavirus vaccine product routinely given to infants from January 2012 until June 2018 when RotaTeq® (3-dose series) replaced it as the routine infant product. In June 2021, BC switched back to Rotarix® as the routine infant product. Since RotaTeq® requires a 3-dose series, it may have led to reduced coverage for the 2018 birth cohort (2020 report). Starting with the 2019 birth cohort (2021 report) only 2 doses were required to be considered up-to-date for rotavirus, regardless of product given, which likely explains the increase in coverage in 2021. See the History of Immunization in BC.
6. In 2019, resources available to early childhood immunization may have been impacted by other public health immunization programs, including the measles catch-up immunization campaign for school-age children, the implementation of the Vaccination Status Reporting Regulation for school-age children, and the migration of public health information systems in FH. This may have resulted in decreases in two-year-old coverage rates.
7. In June-July 2013, several changes to immunization registry systems occurred. First, the health authorities using the iPHIS immunization registry migrated their data to the Panorama immunization registry. Second, NH began using the Community Medical Office Information System (cMOIS) to record immunizations at point of care, with secondary data entry into Panorama. The data source for two-year-old coverage immunization coverage changed to Panorama as of 2013.

   The decline in coverage in 2013 may be explained by the change in the immunization registry. Due to increased workload involved with the new system, there was decreased clinic availability in some regions, leading to fewer children being immunized. In addition, some regions were unable to run their recall and reminder reports out of the new system, and therefore did not notify all children who were behind on their immunizations prior to their second birthday. In NH, during the initial cMOIS implementation timeliness of data import into Panorama may have been impacted, which might be observed as artificial declines in coverage. Current data transfer between systems is rapid with no expected reporting lag.
8. In February 2020, a small number of historical immunization records for NH were added to Panorama. Since only immunizations were added and these children were already included in the population denominator, this may have underestimated coverage rates for certain antigens and overall up-to-date for age for the 2019 report (2017 birth cohort).
9. In January 2012, the second dose of MMR vaccine was moved from 18-months to 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. As a result of this change, MMR coverage for the 2012 report (2010 birth cohort) increased dramatically when compared to previous years. If only one dose of MMR had been required for the 2011 report (2009 birth cohort), MMR coverage would have been 13% higher (89%), the overall percent up-to-date for age would have been 3% higher (71%), and the overall percent up-to-date minus booster would have been 2.6% higher (80%).
10. Starting in 2015 (2013 birth cohort), a Hib booster dose is considered valid when given as early as 12 months of age; previously, the minimum age for this dose was 15 months. This change had a very small effect on coverage estimates - at the provincial level, this change resulted in an increase of 0.2% in children up-to-date for Hib.
11. In each cohort, there is generally a small number of children with PIR records indicating that they lived in BC but did not have a specific health region assigned (i.e., the client health region was missing). These children are excluded from the analysis.
12. Prior to 2017, children who received a single dose of quadrivalent meningococcal vaccine on or after 12 months of age were considered up-to-date for meningococcal C conjugate. Starting in the 2017 report (2015 birth cohort), children who receive quadrivalent meningococcal vaccine are only

considered up-to-date for meningococcal C conjugate if they receive 2-3 doses (depending on age at first dose) and if the trade name of those doses is recorded as Menveo®. Starting in the 2021 report (2019 birth cohort), children who receive at least one dose of Nimenrix® on or after 12 months of age are also considered up-to-date for meningococcal C conjugate.

13. Each health authority has different recall/follow-up practices that may impact coverage in each region at different milestones.
14. A significant cold-chain incident in Northwest HSDA impacted certain antigens (diphtheria, tetanus, pertussis, hepatitis B, Hib, pneumococcal conjugate, and varicella) and may have contributed to the 6% decline in UTD seen in 2023. The cold-chain incident also impacted rotavirus vaccine and may have contributed to the 4% decline in rotavirus coverage in 2023. For rotavirus, clients may have aged out before being able to receive revaccination.
15. In NH, some communities are not part of the normal immunization record submission process which may result in a delay in immunization records being entered into PIR; this may result in lower coverage rates being reported.
16. Data need to be interpreted with caution for the following reasons:
    a. To be considered up-to-date for age, documentation of every dose in the provincial immunization registry is required. Some children may have received doses that have not been documented in the immunization registry. All regions make their best efforts to obtain vaccination records pertaining to physician-delivered immunizations. There can be a delay in obtaining these records from physicians, which can result in delay of data entry. Both these issues will artificially lower the rates of vaccine coverage.
    b. Data completeness with respect to children residing in the Health Authority may vary. Some regions enter all children born in their region into the registry while other regions only enter children that present for service into the system. In addition, First Nations children may not be completely captured in the registry system, as on-reserve birth records and immunizations may not be entered into PIR. 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.
    c. 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.

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