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# Immunization coverage at the 7<sup>th</sup> birthday in British Columbia

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## Background

- Measles, mumps, rubella, diphtheria, tetanus, and pertussis are vaccine-preventable diseases that can cause serious complications. (1,2)
- Achieving high vaccination coverage ( $\geq 95\%$ ) is deemed necessary for prevention of sustained disease transmission, particularly for pertussis and measles. (3) British Columbia (BC) is signatory to national targets to achieve 95% 2 dose MMR (measles, mumps and rubella) and 5 dose DTaP (diphtheria, tetanus, and pertussis) vaccine coverage by the 7<sup>th</sup> birthday by 2025. (4)
- Annual provincial immunization coverage estimates show a gradual and consistent decline over the past decade in the percentage of children at the 7<sup>th</sup> birthday who are up to date for MMR and DTaP vaccine in BC. (5)
- Coverage rates in recent years for these antigens are approximately 20% below the national target of 95%. Reasons for these suboptimal rates are unclear, therefore further investigation is needed.
- Currently, provincial immunization coverage estimates only include doses given prior to the 7<sup>th</sup> birthday, however children may receive missing vaccines after the 7<sup>th</sup> birthday.

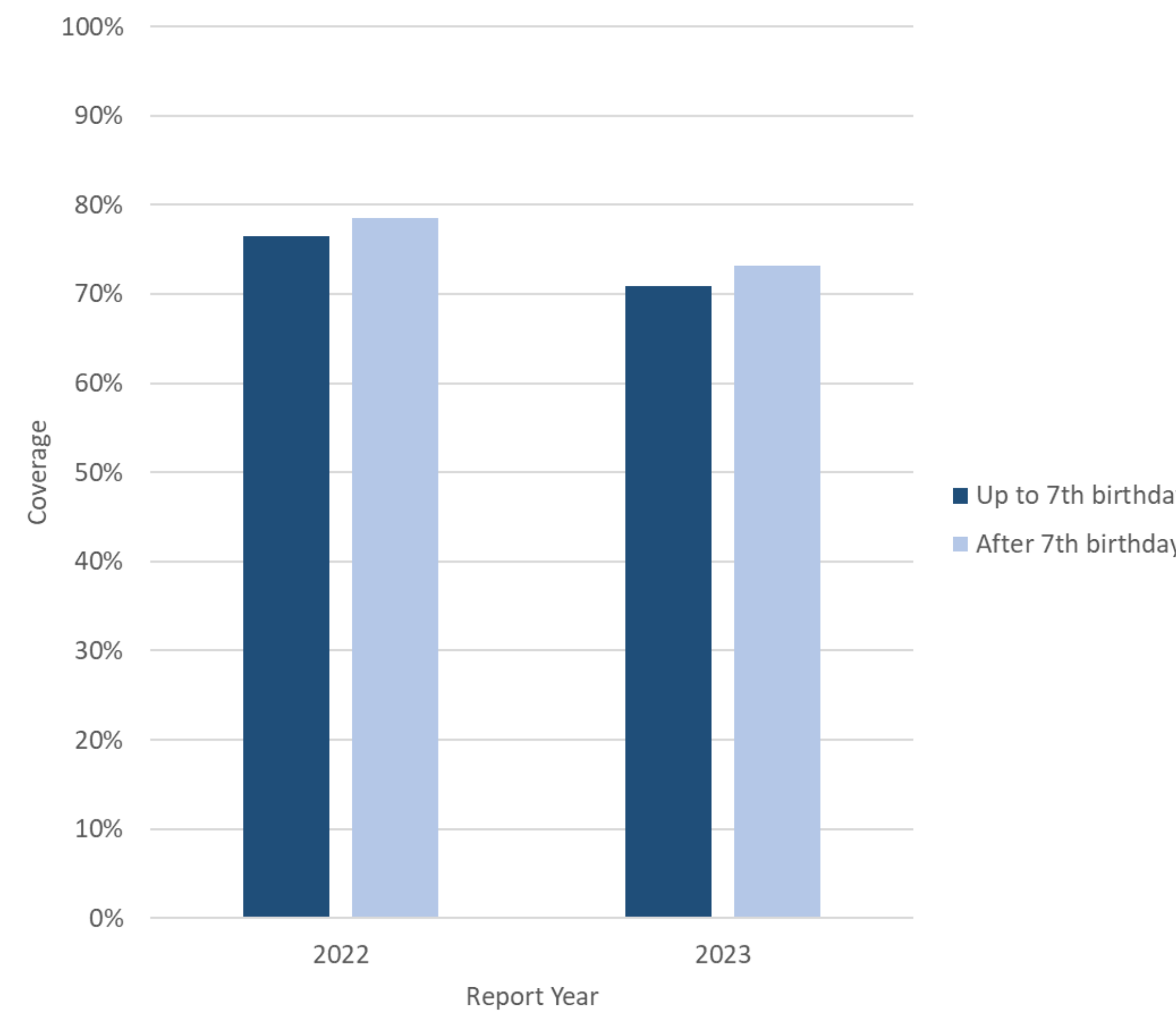
## Objective

- To assess completion of 'school entry' doses beyond the current cut-off point (prior to 7<sup>th</sup> birthday) to quantify delayed dose receipt as a contributor to suboptimal immunization coverage rates.

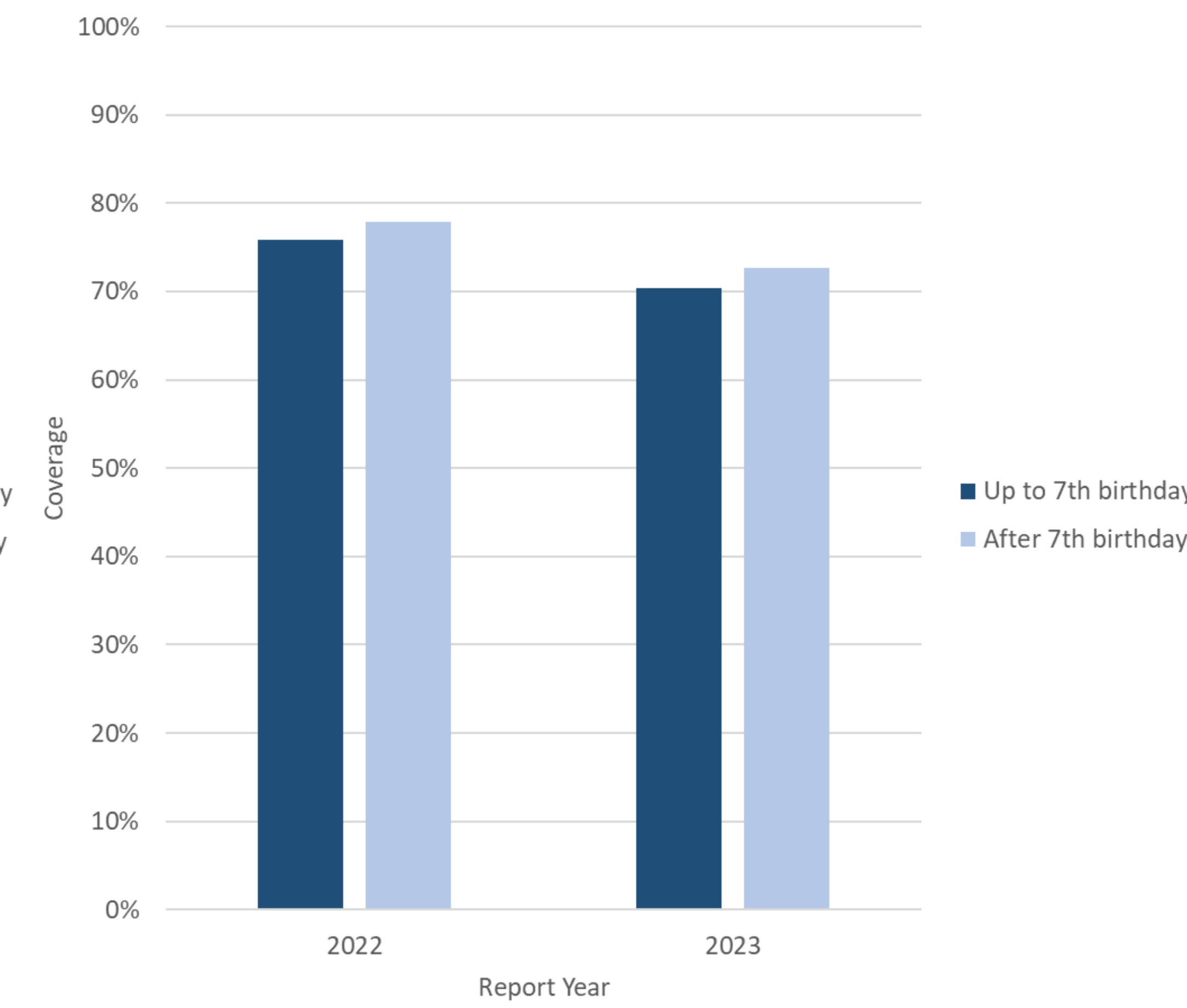
## Methods

- Measles-containing and tetanus-containing vaccine coverage estimates by the 7<sup>th</sup> birthday for 2022 and 2023 were calculated using data from the provincial immunization registry (PIR; Panorama) with and without inclusion of doses given on or after the 7<sup>th</sup> birthday.
- This includes children who turned 7 in 2021 (born in 2014) and 2022 (born in 2015), respectively.
- Doses given after the 7<sup>th</sup> birthday included those administered up until the date of data extraction (July 15, 2022 for those born in 2014, and July 31, 2023 for those born in 2015).
- Denominator:** the number of children who turned 7 years old in the year preceding the report year with active records in the PIR (Panorama) and with immunization registry records indicating they were registered in a BC school as of June 30 of the school year.
- Numerator:** the number of children from the denominator who were up-to-date for measles-containing or tetanus-containing vaccine.
- Exclusions:** Vancouver Coastal Health (VCH) was excluded from analysis as coverage for this health authority is calculated from a regional registry.

## Results



**Figure 1.** Coverage rates for measles-containing vaccines in BC before and after inclusion of doses given beyond the 7<sup>th</sup> birthday, 2022 and 2023.



**Figure 2.** Coverage rates for tetanus-containing vaccines in BC before and after inclusion of doses given beyond the 7<sup>th</sup> birthday, 2022 and 2023.

- Coverage calculated based only on doses given before the 7<sup>th</sup> birthday was 70.9% in 2023 and 76.4% in 2022 for measles-containing vaccines. After including doses given on or after the 7<sup>th</sup> birthday, coverage was 73.2% in 2023 and 78.5% in 2022, increases of 2.3% and 2.1%, respectively (**Figure 1**).
- For tetanus-containing vaccines, coverage calculated based on doses given before the 7<sup>th</sup> birthday was 70.4% in 2023 and 75.9% in 2022. After including doses given on or after the 7<sup>th</sup> birthday, coverage was 72.6% in 2023 and 77.9% in 2022, increases of 2.2% and 2.0%, respectively (**Figure 2**).
- Most children who turned 7 in 2021 and 2022 had received their most recent measles and tetanus-containing vaccine doses within the recommended age interval (48-72 months; **Figures 3-6**), with only a small proportion administered after the 7<sup>th</sup> birthday.

## Conclusion

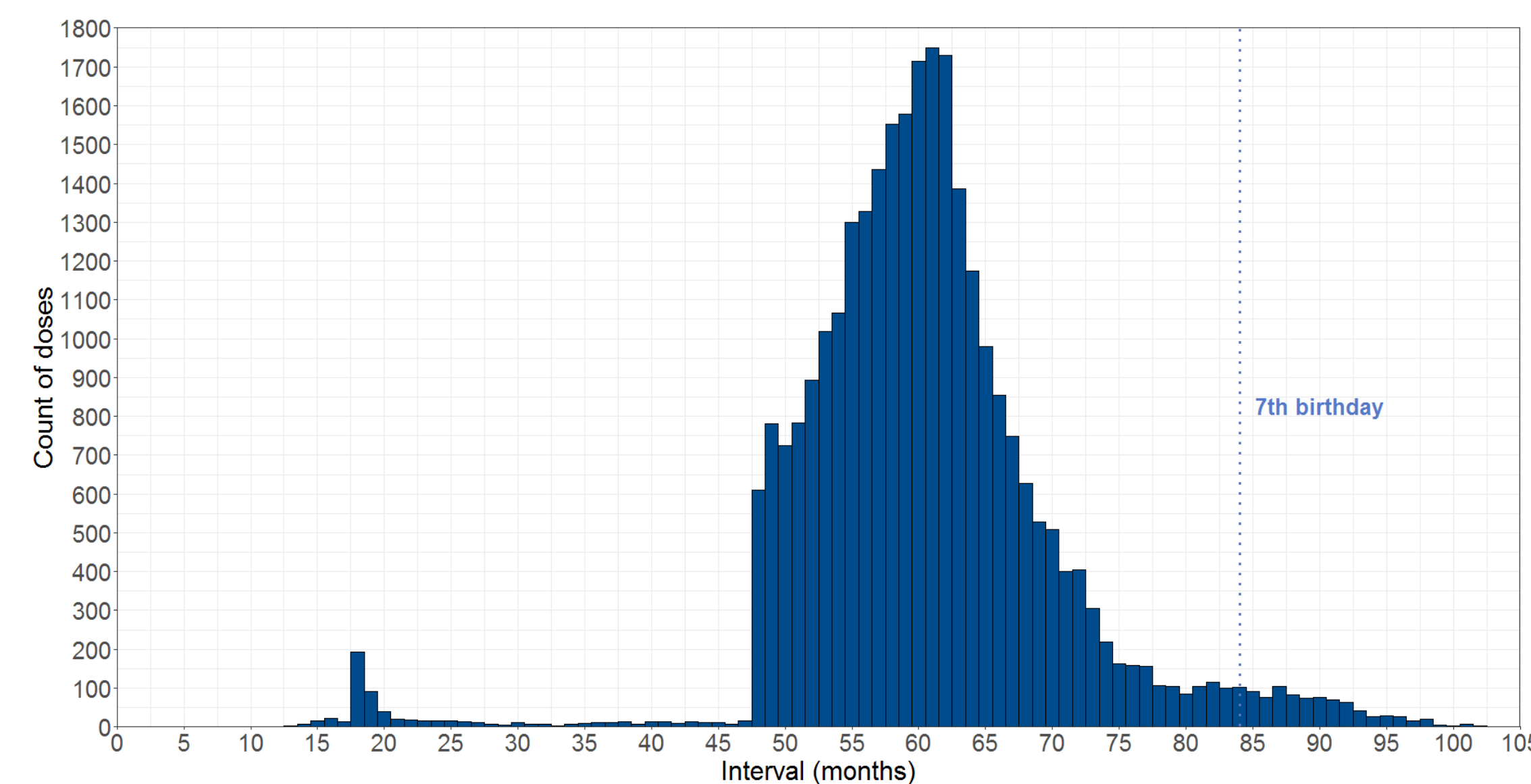
- Assessing doses given beyond the 7<sup>th</sup> birthday resulted in increases in coverage ranging from 2.0-2.3% for measles-containing and diphtheria/tetanus-containing vaccines, although most doses were given within the recommended age interval.
- Although this is an improvement, coverage estimates continue to remain below the 95% national target (4).
- Activities such as collecting missing immunization records and offering additional opportunities for catch-up are needed to further increase coverage.
- Additional research, such as surveys with parents of unimmunized children, may provide further insight as to reasons for the declines in measles and tetanus-containing vaccines in recent years.

## Acknowledgements

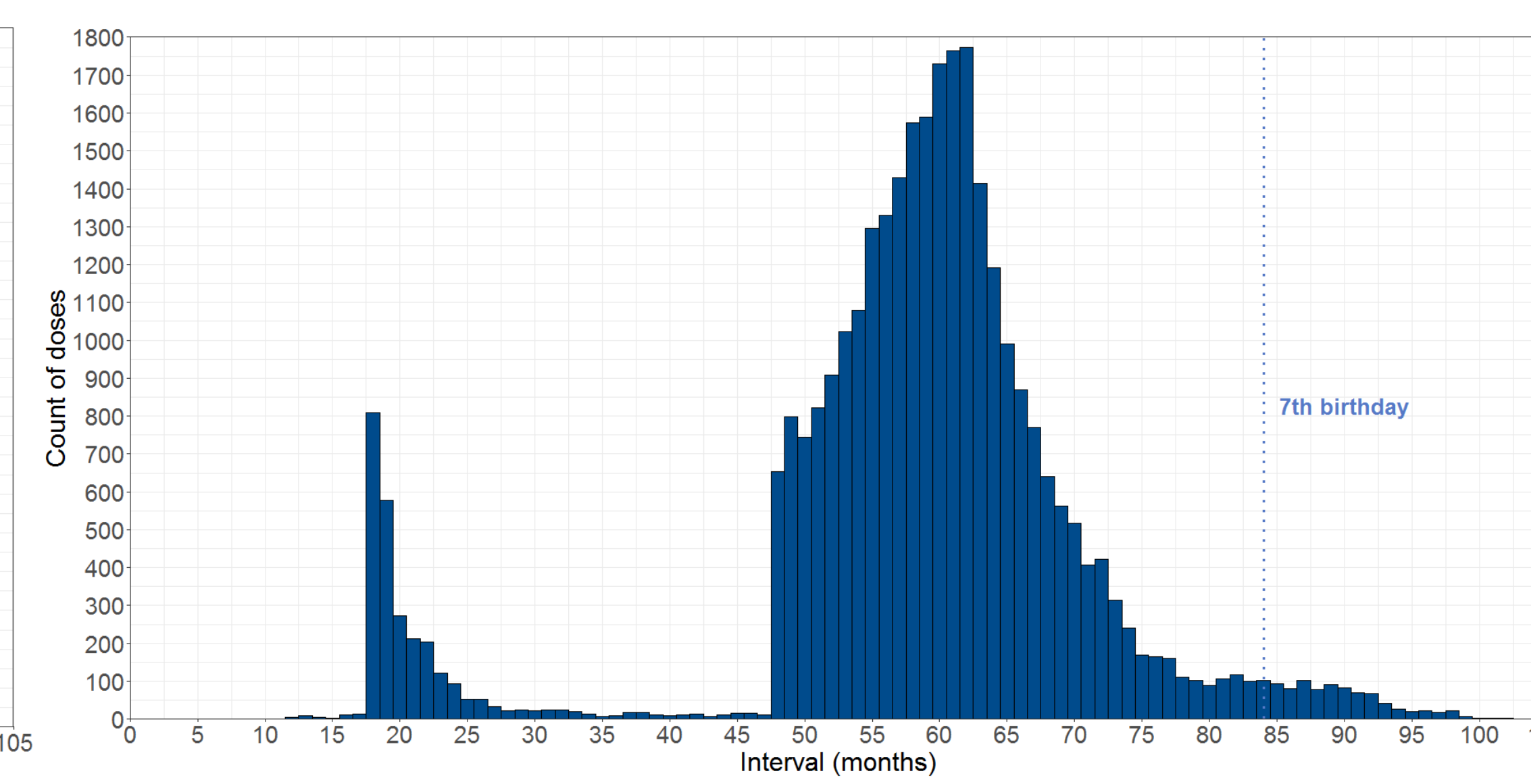
We acknowledge BC Health Authorities for the contribution of information for this project.

## References

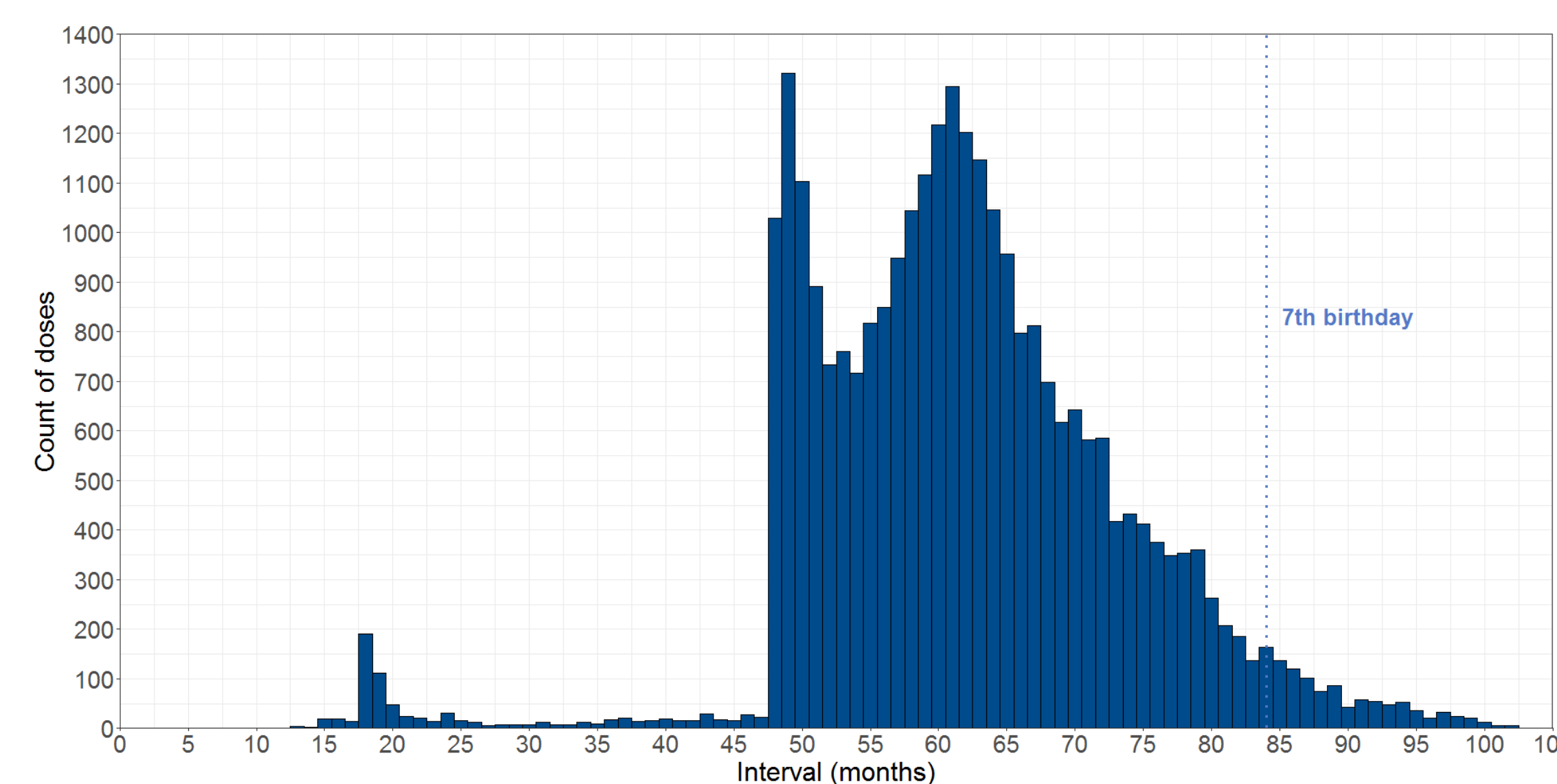
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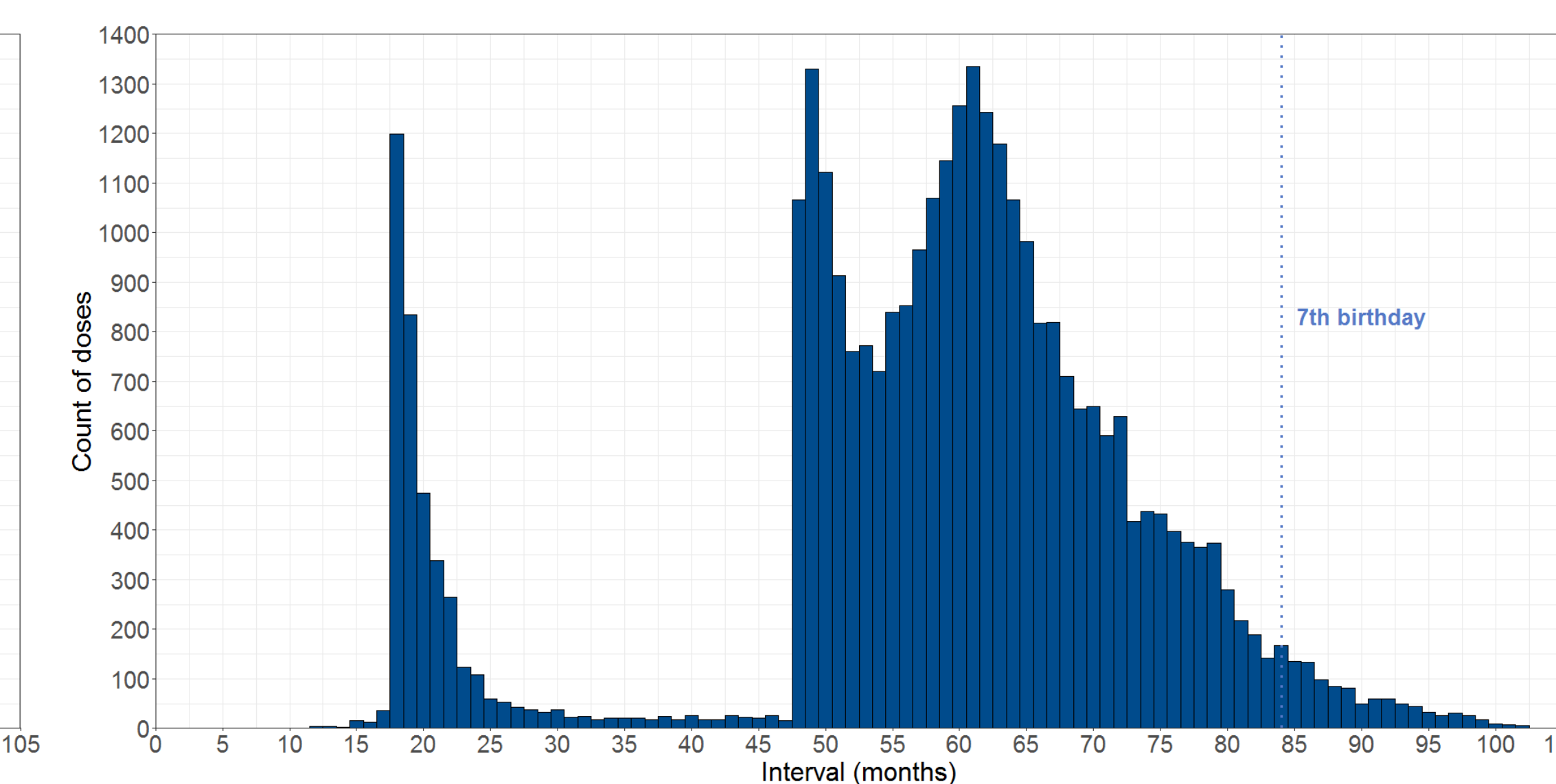
**Figure 3.** Age (in months) at receipt of the most recent measles-containing vaccine dose among BC children who turned 7 in 2021.



**Figure 4.** Age (in months) at receipt of the most recent tetanus-containing vaccine dose among BC children who turned 7 in 2021.



**Figure 5.** Age (in months) at receipt of the most recent measles-containing vaccine dose among BC children who turned 7 in 2022.



**Figure 6.** Age (in months) at receipt of the most recent tetanus-containing vaccine dose among BC children who turned 7 in 2022.