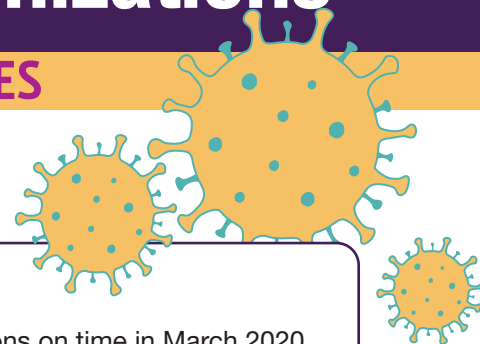


# Missed or Delayed Routine Childhood Immunizations

## EXAMINING THE SOCIETAL CONSEQUENCES OF THE COVID-19 PANDEMIC



### Key Findings:

- Lower percentages of infants and toddlers received their immunizations on time in March 2020, compared to March 2019, in most health regions.
- The percentages of infants and toddlers who received their routine immunizations on time improved between March and July 2020; however, percentages in July 2020 were still lower than July 2019 for most regions.

## Situation

Routine immunizations are essential services<sup>1</sup> and were not suspended through response measures to COVID-19; however, numerous factors created delays or missed doses of routine childhood immunizations. Some factors included: public health staff being redeployed to meet the most urgent health care needs, in-person health care visits were reduced to prevent COVID-19 transmission,<sup>2</sup> some parents/guardians were hesitant to enter health care facilities due to fears of exposure to COVID-19,<sup>3</sup> and the suspension of in-classroom learning for several months impacted the delivery of immunizations in schools.

## Background

Vaccines are developed to prevent people from contracting serious and life-threatening diseases, such as meningitis, tetanus, measles, and polio.<sup>4</sup> Vaccines have been around since the late 18th century<sup>5,6,7</sup> and they work by training the immune system to recognize and combat pathogens, including viruses or bacteria.<sup>8</sup> Today, vaccines prevent 2 to 3 million deaths worldwide every year.<sup>9</sup> In Canada, vaccines have saved more lives than any other medical intervention in the past 50 years.<sup>10</sup>

BC's routine childhood immunization schedule recommends that infants, toddlers, children, and youth receive the following vaccines:<sup>11</sup>



Age	Routine vaccination scheduled
2 months	<ul style="list-style-type: none"> <li>• DTaP-HB-IPV-Hib: Diphtheria, Tetanus, Pertussis, Hepatitis B, Polio, and <i>Haemophilus influenzae</i> type b</li> <li>• Meningococcal C Conjugate (Men-C)</li> <li>• Pneumococcal Conjugate (PCV 13)</li> <li>• Rotavirus</li> </ul>
4 months	<ul style="list-style-type: none"> <li>• DTaP-HB-IPV-Hib: Diphtheria, Tetanus, Pertussis, Hepatitis B, Polio, and <i>Haemophilus influenzae</i> type b</li> <li>• PCV 13</li> <li>• Rotavirus</li> </ul>
6 months	<ul style="list-style-type: none"> <li>• DTaP-HB-IPV-Hib: Diphtheria, Tetanus, Pertussis, Hepatitis B, Polio, and <i>Haemophilus influenzae</i> type b</li> <li>• Rotavirus</li> </ul>
12 months	<ul style="list-style-type: none"> <li>• Varicella (Chickenpox)</li> <li>• Measles, Mumps, and Rubella (MMR)</li> <li>• Men-C</li> <li>• PCV 13</li> </ul>
18 months	<ul style="list-style-type: none"> <li>• DTaP-IPV-Hib: Diphtheria, Tetanus, Pertussis, Polio, and <i>Haemophilus influenzae</i> type b</li> </ul>
4-6 years	<ul style="list-style-type: none"> <li>• MMRV: Measles, Mumps, Rubella, and Varicella</li> <li>• DTaP-IPV: Diphtheria, Tetanus, Pertussis, and Polio</li> </ul>
Grade 6	<ul style="list-style-type: none"> <li>• Catch-up doses if needed for: Chickenpox and Hepatitis B</li> <li>• Human Papillomavirus (HPV) (2-3 doses in Gr. 6)</li> </ul>
Grade 9	<ul style="list-style-type: none"> <li>• Meningococcal Quadrivalent</li> <li>• DTaP: Diphtheria, Tetanus, and Pertussis</li> </ul>

In addition to the vaccines listed in the table above, Canada's National Advisory Committee on Immunization recommends that everyone 6 months of age and older should get a yearly influenza vaccination (with rare exceptions).<sup>11</sup> For more information about routine vaccinations, see: <https://www.healthlinkbc.ca/tools-videos/bc-immunization-schedules>

Vaccines are delivered by a variety of practitioners in BC, including public health nurses, physicians, nurse practitioners,<sup>12</sup> and pharmacists.<sup>13</sup> Infants, toddlers, children, and youth can receive their routine immunizations at their local public health unit, community health centre, or doctor's office, and if over the age of 5, at their local pharmacy.<sup>14</sup> Public health units also organize clinics at schools to administer vaccines.<sup>15</sup> In rural areas, vaccines

are more commonly administered by public health personnel, whereas they are delivered by a greater mix of practitioners in urban areas.<sup>12</sup> Receipt of routine vaccinations is tracked in BC immunization registries. Parents/guardians can also track routine vaccinations in BC's Child Health Passport.<sup>16</sup>

In March and April, 2020, public health units observed that parents were cancelling immunization appointments for fear of potentially contracting COVID-19 when visiting a healthcare facility.<sup>3</sup> International and national health agencies have issued a call for efforts to ensure continuity of immunization against childhood vaccine preventable diseases.<sup>17,18,19,20</sup>

## *The First Nations Health Authority's Statement on the Societal Consequences of BC's COVID-19 Response*

COVID-19 and the public health measures taken to respond to it have reinforced existing inequities and discrimination present in BC's health and wellness system. First Nations people in BC have been disproportionately affected by COVID-19. Data show that First Nations people in BC have tested positive for COVID-19 at a higher rate than other residents, have had lower median ages of hospitalization and have higher rates of admission to intensive care units and death from the virus. The impact of COVID-19 on social determinants such as housing, food security, education, and geography has had ripple effects on the health and wellness of First Nations in BC. This is evident in the significant increase in toxic drug deaths during the pandemic and the elevated rates of anxiety, depression, and grief

experienced by many First Nations people, which is further layered with intergenerational trauma and loss from past pandemics. Despite these challenges, First Nations people in BC have responded to the pandemic with strength and resilience that is grounded in culture and community. Families have found new ways to connect, support their communities and keep each other well. The First Nations Health Authority (FNHA) has worked quickly to expand virtual services, and proudly served as a partner to First Nations communities in BC to advance community priorities and ensure support and services have been available throughout the pandemic. The FNHA's full statement on the societal consequences of BC's COVID-19 response can be found at: [www.fnha.ca/Documents/FNHA-COVID-19-Statement.pdf](http://www.fnha.ca/Documents/FNHA-COVID-19-Statement.pdf).

## Findings

This section provides an overview of the changes between 2019 and 2020, in the percentages of infants and toddlers who were “immunized on time”<sup>a</sup> by vaccine, month of expected vaccination, and health region. (See Appendix A for more information about data sources and methodology).

Overall, analyses of immunization data about on-time vaccinations that compare the same months in 2019 and 2020, show changes in percentages of infants and toddlers who were immunized on time at 2, 4, 6, 12, and 18 months of age for diphtheria, tetanus, pertussis, hepatitis B, polio, and *Haemophilus influenzae* type b (DTaP-HB-IPV-Hib). Analyses also show changes in the percentages (between 2019 and 2020) of infants who were immunized on time at 12 months of age for measles, mumps, and rubella (MMR).

At the time of this reporting, the most recent data available to the project team was up to July 2020, for vaccinations of toddlers age 2 months, 4 months, 6 months, and 18 months. Analyses of on-time immunizations for more recent months, as well as for 4–6-year-old children, and for youth in grades 6–9 were not available to the project team at the time of reporting, but will be added to this report if/when data becomes available.

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<sup>a</sup> “Immunized on time” is defined as receiving the recommended number of doses of the indicated vaccine within one month of the recommended age milestone in the [BC Routine Immunization Schedule](#). For example, for the 4-month DTaP-HB-IPV-Hib measure, children are counted as immunized on time if they received their second dose of DTaP-HB-IPV-Hib before they turned 5 months of age.

FIGURE 1

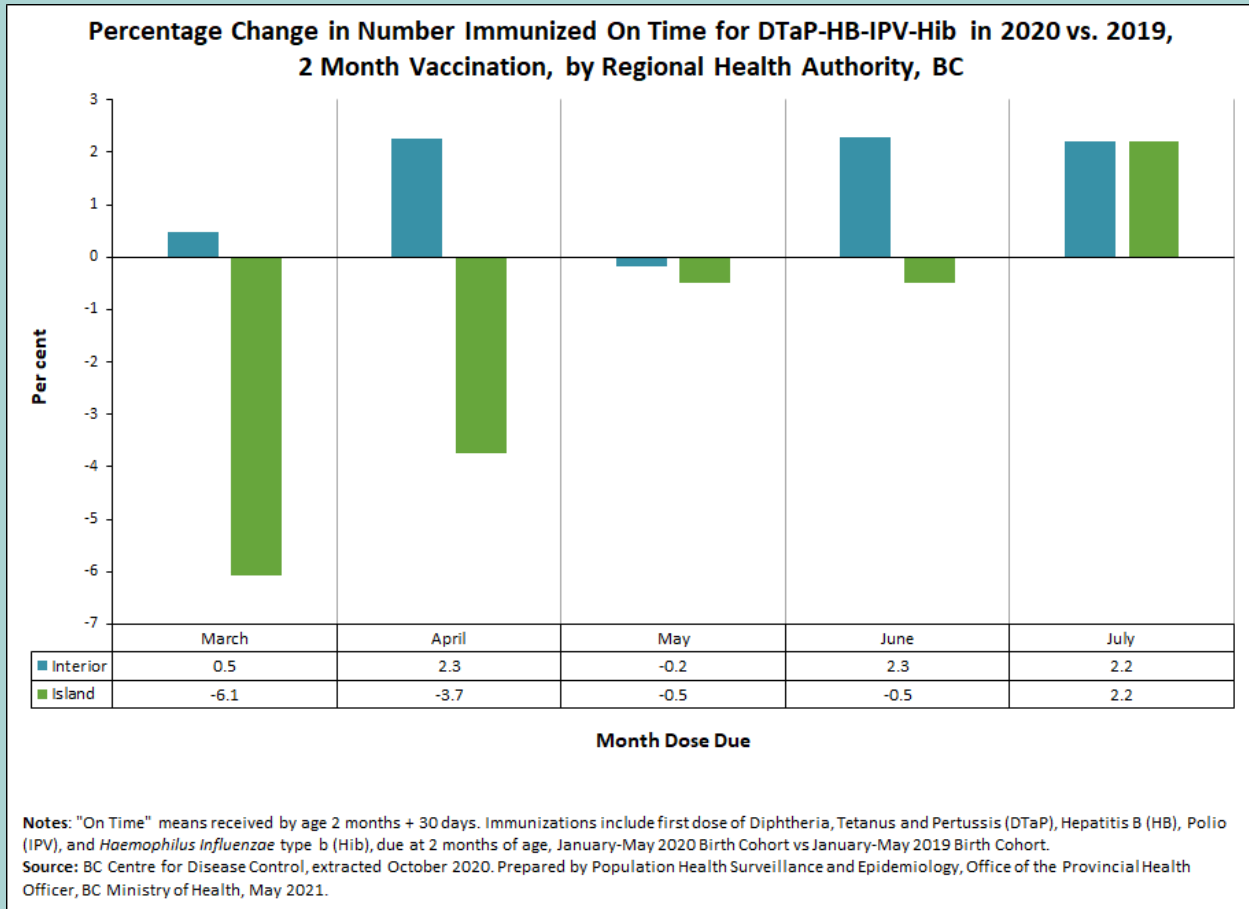


Figure 1 shows the changes between 2019 and 2020, in the percentages of infants who received their 2-month DTaP-HB-IPV-Hib vaccine on time in the Interior and Island health regions.<sup>b</sup> In the Island health region, the proportion of 2-month old infants who received their vaccine on time was 6.1% lower in March 2020, compared with March 2019, but it improved over the following four months. By July 2020, the proportion of 2-month old infants in the Island and Interior health regions who received their vaccinations on time was 2.2% higher in July 2020 compared to July 2019.

b Data for this variable is currently not available for the Fraser, Northern, and Vancouver Coastal health regions.

FIGURE 2

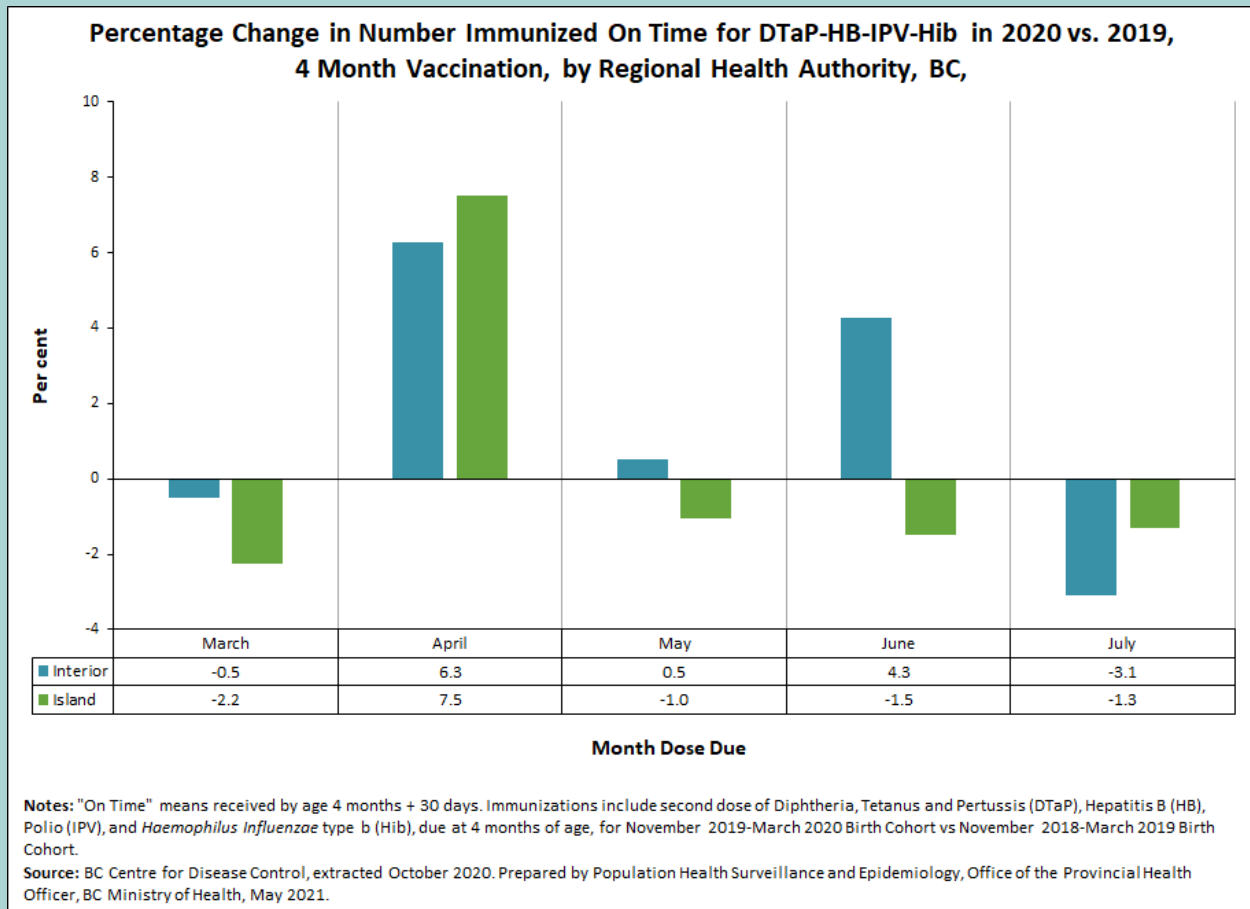


Figure 2 shows the changes between 2019 and 2020, in the percentages of infants who received their 4-month DTaP-HB-IPV-Hib vaccine on time in the Interior and Island health regions.<sup>c</sup> The proportion of 4-month old infants who were immunized on time in the Interior health and Island health regions was lower in March 2020, compared to March 2019 (-0.5% and -2.2%, respectively). In April 2020, however, a higher proportion of 4-month old infants were immunized on time in both health regions, compared to April 2019. By July 2020, the proportion of 4-month old infants who were immunized on time was lower than it was in July 2019.

c Data for this variable is currently not available for the Fraser, Northern, and Vancouver Coastal health regions.

FIGURE 3

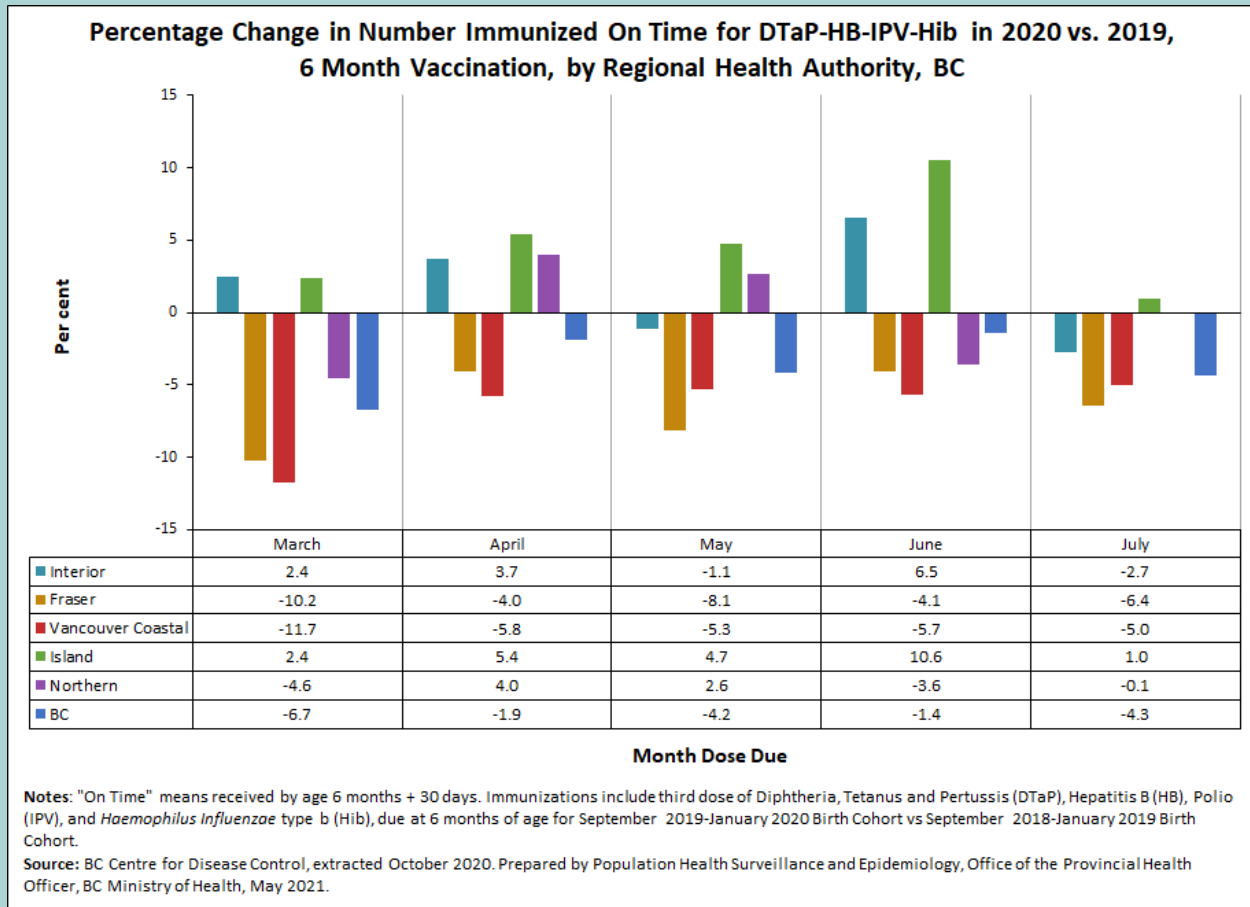


Figure 3 shows the changes in the percentages of infants who received their 6-month DTaP-HB-IPV-Hib vaccine on time between 2019 and 2020, in all five regional health areas and for BC in total. Overall, BC experienced a decrease in the proportion of infants who received their 6-month vaccinations on time from March to July 2020, compared to those months in 2019. The proportion of infants vaccinated on time in the Fraser and Vancouver Coastal health regions, was lower in 2020 compared to 2019 for all five months. In contrast the proportion of infants in the Island health region who received their 6-month vaccines on time was higher in 2020 than 2019, for all five months.

FIGURE 4

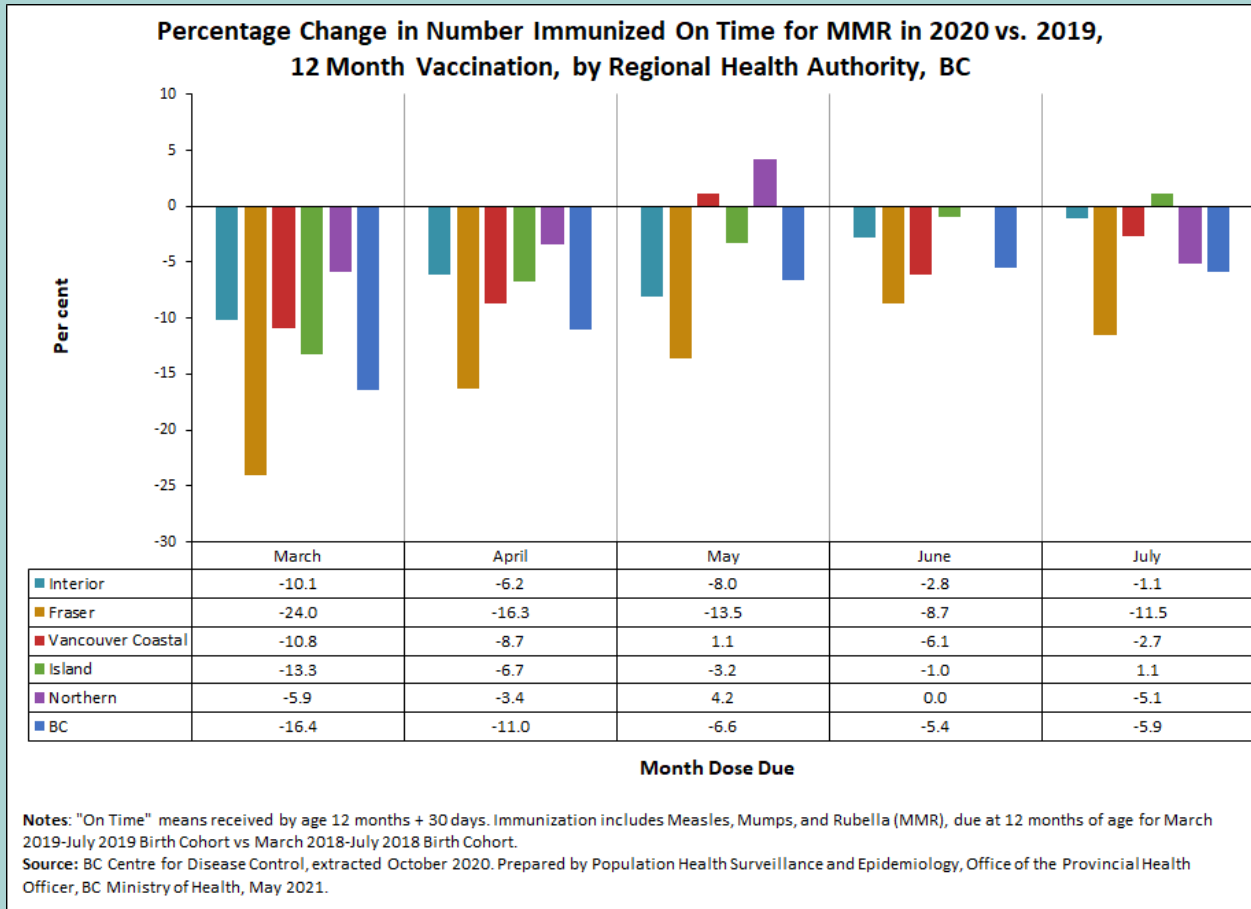


Figure 4 shows the changes between 2019 and 2020, in the percentages of infants who received their 12-month MMR vaccine on time for all five health regions. Overall, BC experienced a decrease in the proportion of infants who were vaccinated on time in all five months from March to July 2020, compared to the same months in 2019. Fraser Health experienced the largest decreases in all five months shown. The decrease in the proportions of on-time immunizations at age 12 months are larger than those for 2-month, 4-month and 6-month immunizations.

FIGURE 5

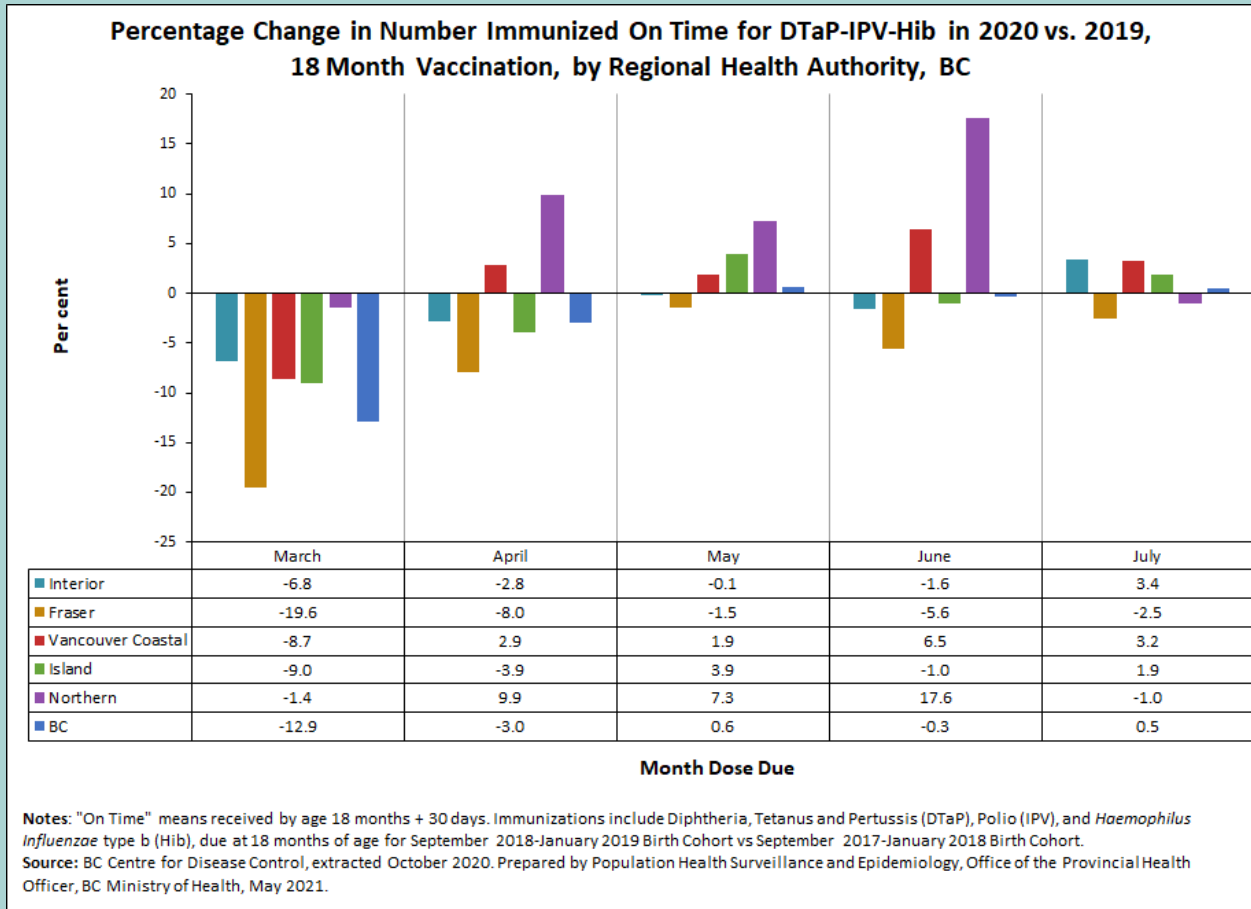


Figure 5 shows the changes between 2019 and 2020, in the percentages of toddlers who received their 18-month DTaP-HB-IPV-Hib vaccination on time for all five health regions. Overall, BC experienced a decrease in the proportion of toddlers who were vaccinated on time in March, April, and June 2020, compared to the same months in 2019. While the proportion of toddlers who received their vaccination on time was lower for all health regions in March 2020 compared to March 2019, other months show mixed results.



## Equity Considerations

Analyses to identify linkages between on-time vaccinations and socio-economic factors, such as household income or access to transportation, are not currently possible. Geographic analyses shown here based on health region does show differences between regions, with lower percentages of infants and toddlers being immunized on time in March 2020 compared to 2019 in most health regions, but especially for the Fraser health region.

### *Indigenous Peoples and Reconciliation*

For many Indigenous (First Nations, Métis, and Inuit) individuals and communities, public health restrictions were layered onto the existing stresses of intergenerational trauma, ongoing structural racism, and culturally unsafe healthcare settings. This combination of factors exacerbated challenges to accessing routine childhood vaccinations at in-person health care settings during the COVID-19 pandemic. More engagement with Indigenous partner organizations and analyses are required to ensure Indigenous Peoples are appropriately and respectfully supported in catch-up immunization programs.

## Actions Initiated or Planned to Address Unintended Consequence

The British Columbia Centre for Disease Control (BCCDC) issued guidelines to support continuity of immunization services during the COVID-19 response measures on April 9, 2020, and a public information campaign promoting immunization services as essential and safe from COVID-19 transmission began on April 15, 2020.<sup>21</sup> Guidelines for immunization continuity have also been issued by the National Advisory Committee on Immunization and the Canadian Paediatric Society to continue immunization programs during the COVID-19 pandemic.<sup>22,23</sup>

Promotion of immunization as an essential service, and collaboration with immunization providers, will continue to be conducted to optimize and prioritize vaccination in the infant/ toddler period when on-time immunization is most important for disease prevention.

## Considerations for Further Action

This section provides considerations for action based on the findings of this report. These are not formal recommendations, but rather ideas to consider when shaping recommendations and actions related to this topic.

1. Expand capacity for providing immunization services for children and youth through engagement with additional potential immunization providers in communities.
2. Continue to promote the importance of on-time immunizations for the health and well-being of children, including increased education and awareness of COVID-19 safety protocols in place in health care settings where vaccinations are available.
3. Promote immunization catch-up programs by leveraging mass immunization processes and technologies established for COVID-19 vaccinations.
4. Increase the capacity for timely monitoring and surveillance across BC by facilitating data entry into the provincial immunization registry for monitoring all routine childhood immunizations from birth to Grade 9, and beyond.

## Appendix A: Data methodology notes

### 1. Charts provided by Population Health Surveillance and Epidemiology, Office of the Provincial Health Officer.

For questions contact: [HLTH.PHSE@gov.bc.ca](mailto:HLTH.PHSE@gov.bc.ca).

### 2. Methodology

Figures 1-5 compare the proportion of infants/toddlers immunized on time per health region with the previous year's cohorts. "On time vaccination" is defined as immunization within 30 days of the recommended age. Data for analyses were extracted from the provincial immunization registry. These figures compare the on-time receipt of vaccines for infants/toddlers turning 2-, 4-, 6-, and 18-months of age during the months of March through July 2020, compared to the corresponding cohorts who turned those ages during March through July 2019.

Collection and entry into the registry for this age cohort by Vancouver Coastal Health may not reflect all children in this health region due to a geographic difference in practice. Due to this practice, children in licensed daycares are overrepresented, while other children in some parts of this region may not have records in the registry or the record entry may lag when reported later by physician providers.

Data for infants turning 2-months and 4-months of age during March through July 2020 were not available for Fraser, Northern and Vancouver Coastal regional health authorities.

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