

## Measles Epidemiological Summary, British Columbia 2019 year to date – April 3<sup>rd</sup>

Measles is a highly contagious, acute viral illness preventable by measles vaccine. Canada has been free of endemic measles (defined as an identifiable chain of transmission lasting over 12 months) since 1998 and measles was declared eliminated in the Americas in 2002. However, measles cases and outbreaks continue to occur in Canada due to periodic importation. Notable recent outbreaks in British Columbia (BC) occurred in 2010 during the Winter Olympic Games held in Vancouver and associated with multiple importations including by visitors, and four years later in 2014 when 343 cases were reported, the majority in members of a religious community in the Fraser Valley that objects to vaccination. In 2018, nine cases of measles were reported; three of these cases were out of country residents visiting BC.

### Measles in BC in 2019

As of April 3<sup>rd</sup>, 22 confirmed cases of measles have been reported in 2019 amongst BC residents. None have been linked to the measles outbreak in Washington State, with the epicentre in Clark County, which began January 1, 2019.<sup>1</sup> The summary below is in chronological order of occurrence.

Two cases with rash onset in January and one case in February were adults who acquired measles during travel to the Philippines, where a large measles outbreak is ongoing.<sup>2</sup> A separate case with no out-of-country travel occurred in February.<sup>3</sup> While this case had no clear epidemiologic links to earlier BC cases, the measles virus genotype of all of these cases was B3.<sup>4</sup>

In a separate series of events beginning in late January, three school-age children who acquired measles infection while traveling in Vietnam returned to Vancouver. They developed symptoms immediately prior to travel or upon return, and resulted in transmission to 4 other students. An additional 6 cases were identified among those exposed in medical settings or households. The measles virus genotype associated with this outbreak was D8.<sup>4</sup> As of April 3<sup>rd</sup>, 21 days have elapsed since the date of onset rash in the last case in this outbreak, without additional cases being recognized and suggesting that this outbreak is over.

In an event unrelated to the above outbreak, a Canadian traveler returned from the Philippines to the Northwest Territories and transited through Vancouver International Airport, overnighing in Richmond from February 11<sup>th</sup> through 12<sup>th</sup>. This event is not counted as a BC case, but the event resulted in public notification about potential exposures; no recognized transmission occurred within BC.

In March, one measles case was reported in a resident of Interior Health Authority region, with travel history compatible with acquisition in the United States. A secondary case later occurred in a household contact. Genotype D8 was identified in the primary case, with a strain different from that identified in the Vancouver outbreak cluster.<sup>4</sup>

<sup>1</sup> For information on the measles outbreak in Washington State:

<https://www.doh.wa.gov/YouandYourFamily/IllnessandDisease/Measles/MeaslesOutbreak>

<sup>2</sup> For information on the measles outbreak in the Philippines:

<https://travel.gc.ca/travelling/health-safety/travel-health-notices/195>

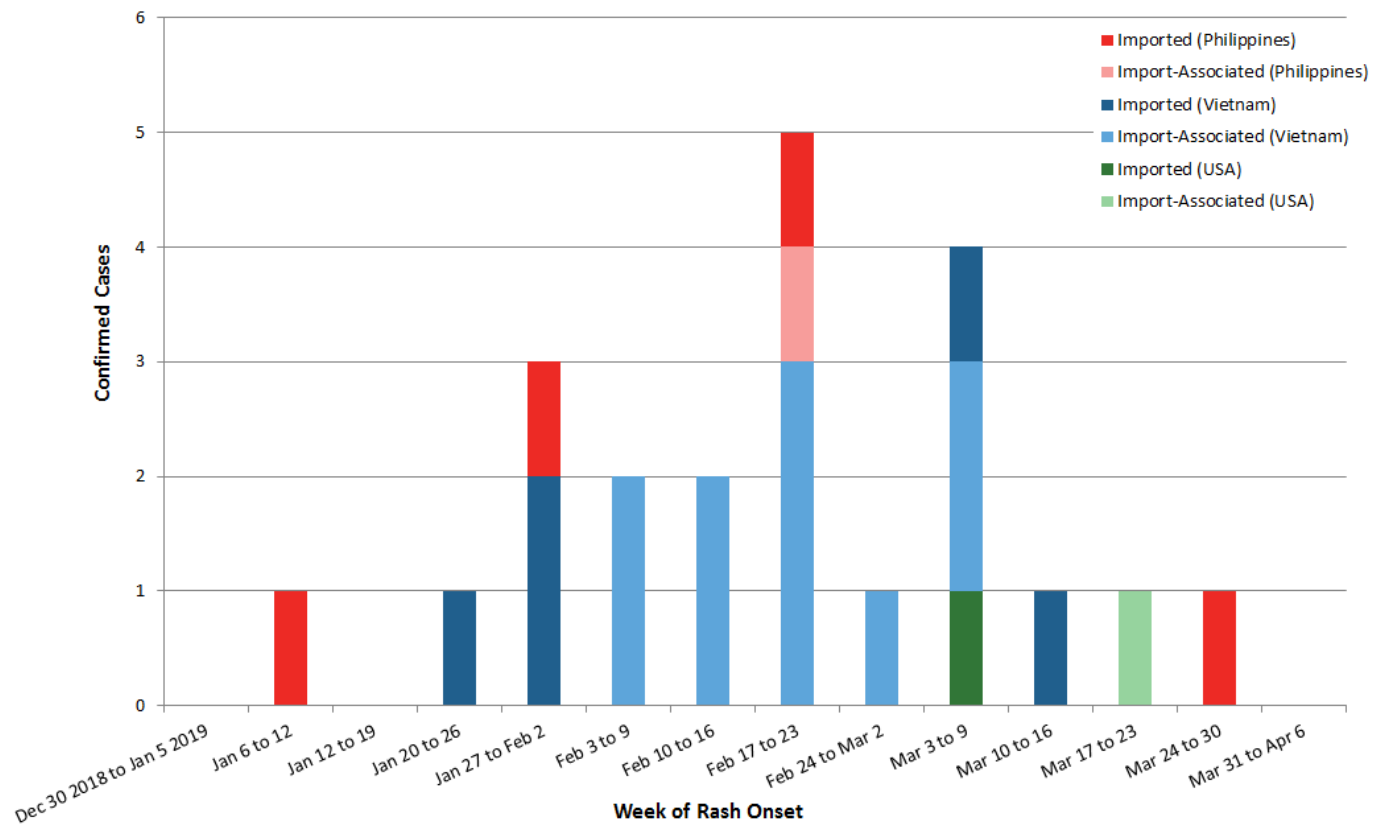
<sup>3</sup> For exposure information from Vancouver Coastal Health:

<http://www.vch.ca/about-us/news/news-releases>

<sup>4</sup> Source: National Microbiology Laboratory, Public Health Agency of Canada

Separately in March, two related measles cases were confirmed in residents of Vancouver Island Health Authority whose travel history is compatible with acquisition in Vietnam.<sup>5</sup> Genotype D8 was identified from one of these cases and was the same strain identified in the school-related outbreak that had also been associated with infection acquired in Vietnam.

Most recently in April, a measles case was confirmed in a resident of Fraser Health Authority with symptom onset in March and with history compatible with acquisition in the Philippines.<sup>6</sup> Genotype information is pending.



**Figure 1:** Confirmed cases of measles by epidemiological week, British Columbia, 2019 to April 3

A breakdown of the confirmed cases by demographic characteristics and vaccination history is provided in Table 1. This is the first report of 2019 to provide a geographic breakdown of measles cases; this is customarily done in epidemiologic reports, but the information was not contained in earlier reports to prevent personal identification of select individuals associated with the school-based outbreak. [Geographic attribution](#) in epidemiologic reports is by place of residence, not by the location of the setting where measles infection was acquired. For vaccination history, undocumented doses are those for which a verbal history is

<sup>5</sup> For exposure information from Vancouver Island Health Authority:  
<https://www.islandhealth.ca/news/news-releases/south-island-measles-exposures-confirmed>

<sup>6</sup> For exposure information from Fraser Health Authority:  
<https://www.fraserhealth.ca/news/2019/Apr/new-confirmed-case-of-measles-in-lower-mainland#.XKUCJ8IKiUm>

provided without substantiating records. For information about measles vaccination recommendations in BC and interpretive information for Table 1, see Appendix.

**Table 1:** Characteristics of confirmed measles cases, British Columbia, 2019 to April 3

Characteristic	Confirmed Cases	
	n	(%)*
<b>Age Group (years)</b>		
<1	0	-
1 to 9	1	(5)
10 to 19	11	(50)
20 to 29	5	(23)
30 to 39	2	(9)
40 +	3	(14)
<b>Sex</b>		
Male	13	(59)
Female	9	(41)
<b>Regional Health Authority</b>		
Fraser Health	8	(36)
Interior Health	2	(9)
Northern Health	0	-
Vancouver Coastal Health	10	(45)
Vancouver Island Health	2	(9)
<b>Vaccination History</b>		
0 doses	9	(41)
1 dose undocumented	2	(9)
2 doses undocumented	4	(18)
1 dose documented	1	(5)
2 doses documented	6	(27)

\*Percentages may not add up to 100% due to rounding

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## APPENDIX.

Two doses of the measles, mumps and rubella (MMR) vaccine are recommended for individuals born after 1970 and healthcare workers born after 1957 to provide protection against measles. The routine childhood schedule for BC children is: 1<sup>st</sup> dose at 12 months of age, and 2<sup>nd</sup> dose at school entry (4-6 years of age). Adults born prior to 1970 are assumed to have been previously infected with measles and are generally considered immune. More details are available in the MMR pages of [Part 4, Biological Products, Chapter 2, Immunization, Communicable Disease Manual](#).

To help understand why a high proportion of cases will occur among vaccinated individuals when a vaccine is highly effective and most of the population are vaccinated, see pages 1056-7 on Screening, and Figure 1 on page 1057, in the following source: Orenstein WA, Bernier RH, Dondero TJ et al. Field Evaluation of Vaccine Efficacy. Bulletin of the World Health Organization. Available at:

<https://apps.who.int/iris/bitstream/handle/10665/265195/PMC2536484.pdf?sequence=1&isAllowed=y>

A lay explanation of this 'vaccine paradox' is available either in the example provided below or separately on the World Health Organization web page titled "The majority of people who get disease have been vaccinated" as one of the Six common misconceptions about immunization, available at the following link: [https://www.who.int/vaccine\\_safety/initiative/detection/immunization\\_misconceptions/en/index2.html](https://www.who.int/vaccine_safety/initiative/detection/immunization_misconceptions/en/index2.html)

Example:

A class has 100 students, and 95 are vaccinated with MMR. The 5 unvaccinated students are susceptible to measles. Because the vaccine is 95% effective, 90 of the vaccinated students are immune to measles, but 5 vaccinated students remain susceptible.

If the students are all exposed to measles, we could expect all 10 susceptible individuals to become infected. Of those infected, 5 (50%) would have received vaccination. If you look within the vaccinated students only, however, just 5 out of 95 became infected (5.3%). Amongst unvaccinated students 5 out of 5 became infected (100%).

