

COVID-19: Variants of Concern & Variants of Interest

June 2021

Background

New COVID-19 variants of concern (VOC) and variants of interest (VOI) have been identified over the past number of months. Science shows that as viruses spread over time they also genetically mutate to better adapt to new hosts and environments.ⁱ This is very common among all viruses, but it is important to note when these genetic mutations lead to higher transmissibility and increased severity of illness. To date, four variants of concern have been detected in British Columbia, each with a slightly different genetic makeup.ⁱⁱ Additionally, there are several variants of interest that have been detected internationally but have not yet been identified within BC. Due to the increasing number of these variants, the World Health Organization (WHO) has established new nomenclature as the previous naming conventions were long and difficult to remember.ⁱⁱⁱ As well, referring to the variant strains based on the country where they were originally located such as the 'South Africa variant' or the 'Brazil variant' was stigmatizing and discriminatory against the people who live in those nations.^{iv} The new WHO names will not replace Pango (Phylogenetic Assignment of Named Global Outbreak) Lineages or other scientific markers, but are instead intended for use among the news and media, policymakers, and the general public to more easily acknowledge specific strains.^v

The variants of concern that have been detected in BC are known as Alpha (B.1.1.7), Beta (B.1.351), Gamma (P.1) and Delta (B.1.1617.2), and the Alpha and Gamma variants are the most common.^{vi,vii} As of May 9th to 15th (epi-week 19), the Alpha variant accounted for an average of 47% of COVID-19 cases in the province, while Gamma, Delta and Beta accounted for approximately 34%, 7% and less than 0.5%, respectively.^{viii} As of June 1st, there have been very few cases of Beta and Delta detected as researchers continue to use polymerase chain reaction (PCR) screening and genomic sequencing to confirm whether an individual has tested positive for one of the variants of concern and what this may mean for the greater population.^{ix} The BCCDC also actively monitors a number of variants of interest as they emerge globally but have not yet found cases of these strains in BC. These variants include Epsilon (1.427/1.429), Zeta (P.2), Eta (1.525), and Iota (1.526).^x

Variants of Concern and Interest with WHO Labels^{xi}

| WHO Label | VOC/VOI | Pango Lineage | Initial Discovery Documented |
|-----------|---------|-----------------|--------------------------------|
| Alpha | VOC | B.1.1.7 | United Kingdom, September 2020 |
| Beta | VOC | B.1.351 | South Africa, May 2020 |
| Gamma | VOC | P.1 | Brazil, November 2020 |
| Delta | VOC | B.1.1617.2 | India, October 2020 |
| Epsilon | VOI | B.1.427/B.1.429 | USA, March 2020 |
| Zeta | VOI | P.2 | Brazil, April 2020 |
| Eta | VOI | B.1.525 | Multiple, December 2020 |
| Theta | VOI | P.3 | Philippines, January 2021 |
| Iota | VOI | B.1.526 | USA, November 2020 |
| Kappa | VOI | B.1.617.1 | India, October 2020 |
| Lambda | VOI | C.37 | Peru, December 2020 |



The [Alpha \(B.1.1.7\)](#) variant was classified as VOC in December 2020, with the [Beta \(B.1.351\)](#) and [Gamma \(P.1\)](#) variants deemed to be VOC shortly after in late December 2020 and January 2021. According to the BCCDC, these variants can spread more easily, the Alpha strain in particular may lead to more severe illness in those who become infected, and the Gamma strain may be able to re-infect people who have previously been ill with COVID-19.^{xii} As of June 1st the Alpha VOC remains the most widespread strain worldwide, having spread to more than 160 countries, followed by Beta in more than 110 countries, and Gamma in more than 60 countries.^{xiii}

The Delta variant was recently upgraded to a VOC by the WHO on May 11th, 2021, and in turn was updated to a VOC in BC.^{xiv} This strain has been especially destructive in South-East Asia, where India specifically has reported more than 28 million cases of COVID-19 and more than 335,000 deaths from COVID-19 since January 2021, of which 1.5 million cases and over 29,000 deaths were reported in the last 7 days, primarily attributed to the Delta variant.^{xv} These cases comprise 43% of new COVID-19 cases globally in the last week, as well as 37% of deaths.^{xvi} This VOC has since spread to more than 60 countries.^{xvii}

The Public Health Agency of Canada (PHAC) states that a strain is deemed a variant of concern when the genetic mutation allows for the disease to spread more readily, causes more severe illness in those who have contracted the disease, affects the way that testing methods can detect the disease, and effects the viability and effectiveness of vaccines or treatments, or a combination of any of these factors.^{xviii} The Canadian SARS-CoV-2 Variant Surveillance Group (CSVSG) monitors and assesses information on new and emerging variants of concern and interest in Canada based on data from the WHO and the US Centers for Disease Control and Prevention (CDC) to determine how they may affect communities in Canada.^{xix} The CSVSG is a collaborative effort between the PHAC and provincial and territorial public health authorities, and outlines potential actions that could be taken in Canada including notifying the WHO of VOC outbreaks, enhancing genomic sequencing surveillance, performing epidemiological investigations according to age, sex, gender, race, ethnicity, Indigeneity, socioeconomic status and place of residence, as well as assessing the impact of specific variants on immune system and antibody response.^{xx}

Immunization is the most effective way to prevent further spread of illness caused by COVID-19. The [vaccines approved for use in Canada](#) have all undergone rigorous testing prior to approval for use. As well, preliminary research demonstrates that the vaccines also exhibit a high level of protection against VOC strains. One international study out of Qatar in April 2021 reported the Pfizer-BioNTech vaccine's estimated efficacy rate to be 89.5% against the Alpha variant 14 days following the second dose, and 75% against the Beta variant 14 days following the second dose.^{xxi} Another study out of Israel demonstrated that the Alpha variant was also the predominant VOC in Israel, accounting for 94.5% of total COVID-19 cases in early 2021, but following their nationwide immunization campaign with three-quarters of Israelis vaccinated by April 2021, the Pfizer-BioNTech vaccine was deemed to be 95.3% effective at preventing infection.^{xxii} Similarly, Moderna has conducted preliminary phase 2 trials on the efficacy of a Moderna booster shot against the Beta and Gamma variants.^{xxiii} While the full results have yet to be shared publicly, the initial data is very promising.^{xxiv,xxv} Furthermore, British Columbia has been lauded internationally for measures taken to curb the spread of the Gamma variant by targeting Gamma 'hot spots' with vaccination drives, significantly reducing the number of cases caused by this variant from February to late April.^{xxvi}

The BCCDC states that data from around the world shows that all four vaccines used in Canada have elicited positive results at preventing illness caused by COVID-19, despite circulating variants.^{xxvii} While the Delta variant is somewhat new, the genetic makeup is very similar to that of other variants, and public health authorities expect that current vaccines will also protect against this strain.^{xxviii}

NNPBC continues to support evidence-based approaches to managing the spread of the COVID-19 pandemic. While vaccination is the most effective approach to slowing the spread of COVID-19, using layers of protection such as wearing a mask, washing hands regularly, practising physical distancing, limiting travel, staying home when ill, and complying with public health guidelines are all strongly recommended. Nursing expertise is critical when it comes to helping people understand the importance of following public health guidelines in a time of COVID-19 mutations and evolving science. Nurses can communicate and educate the public about virus mutation and how all viruses mutate and evolve through time, and that vaccination in addition to



following public health guidelines remain the most effective ways to prevent further spread of illness. For COVID-19, it is not the particular vaccine that protects against infection, but vaccination as a whole. Global data has proven that despite mutations in the virus causing COVID-19, these variants can be stopped just as well when everyone is immunized and when everyone adheres to the established public health regulations.

Key Messages

- To date, four COVID-19 variants of concern have been detected in BC.
- The WHO has published new COVID-19 variant nomenclature based on the Greek alphabet for the general public to use when referring to variants of concern and variants of interest.
- As of June 1st, the most widespread variants of concern in BC are the Alpha (B.1.1.7) and Gamma (P.1) variants, with few reports of the Beta (B.1.351) and Delta (B.1.617.2) variants.
- The Alpha and Gamma variants are expected to be more transmissible, and the Gamma variant may be able to re-infect those who previously suffered from COVID-19.
- First samples of the Delta variant were discovered in India in October 2020, and this variant is believed to be the most common variant in South-East Asia.
- Immunization is the most effective tool to protect against illness caused by COVID-19 and prevent further transmission.
- A combination of phased trials and real-world data show that COVID-19 vaccines largely protect against variants of concern.
- The BCCDC promotes the use of COVID-19 vaccines approved for use in Canada to protect against the Alpha, Beta and Gamma variants, and while the Delta variant is relatively new, the same vaccines are expected to protect against this variant due to its similar genetic structure to those before it.
- Nurses play an important role in educating the public about the importance of COVID-19 vaccination and following public health guidelines, as vaccination, layers of protection (masks), physical distancing, washing hands regularly and following other public health regulations are the best practices for slowing and protecting others from illness caused by COVID-19.

Further Reading/Resources

- [COVID-19: Alpha Variant \(B.1.1.7\)](#)
- [COVID-19: Additional Variants \(B.1.351 and P.1\)](#)
- [Let's Get Vaccinated](#)
- [COVID-19 Vaccine MythBusters](#)
- [BCCDC: COVID-19 Variants](#)
- [Immunize BC: COVID-19](#)
- [World Health Organization: SARS-CoV-2 Variants](#)
- [World Health Organization: Tracking SARS-CoV-2 Variants](#)

ⁱ BCCDCa. June 1, 2021. "[COVID-19 Variants.](#)"

ⁱⁱ BCCDCa

ⁱⁱⁱ WHOa. Dept News. May 31, 2021. "[WHO announces simple, easy-to-say labels for SARS-CoV-2 Variants of Interest and Concern.](#)"



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- iv WHOa
- v Callaway, E. June 1, 2021. *Nature*. "[Coronavirus variants get Greek names – but will scientists use them?](#)"
- vi BCCDCa
- vii WHOv. 2021. "[Tracking SARS-CoV-2 variants.](#)"
- viii BCCDCb. May 27, 2021. "[Weekly update on variants of concern – May 27, 2021.](#)"
- ix BCCDCa
- x BCCDCa
- xi WHOv
- xii BCCDCa
- xiii WHOd. June 1, 2021. "[Weekly epidemiological update on COVID-19 – June 1, 2021.](#)"
- xiv WHOv
- xv WHOc. June 2, 2021. "[Coronavirus \(COVID-19\) Dashboard.](#)"
- xvi WHOd
- xvii WHOd
- xviii PHAC. March 17, 2021. "[COVID-19 variants of concern.](#)"
- xix PHAC. May 14, 2021. "[SARS-CoV-2 variants: National definitions, classifications and public health actions.](#)"
- xx Ibid
- xxi Abu-Raddad, L and Butt, A. May 5, 2021. *New England Journal of Medicine*. "[Effectiveness of the BNT162b2 Covid-19 Vaccine against the B.1.1.7 and B.1.351 Variants.](#)"
- xxii Haas, E, Angulo, FJ, McLaughlin, JM, Anis, E, et al. May 5, 2021. *The Lancet*. 397:1819-29. "[Impact and effectiveness of mRNA BNT162b2 vaccine against SARS-CoV-2 infections and COVID-19 cases, hospitalisations, and deaths following a nationwide vaccination in Israel: an observational study using national surveillance data.](#)"
- xxiii Haseltine, W. May 6, 2021. *Forbes*. "[Vaccines vs Variants: Three Studies Provide New Insights.](#)"
- xxiv BusinessWire. May 5, 2021. "[Moderna Announces Positive Initial Booster Data Against SARS-CoV-2 Variant of Concern.](#)"
- xxv Wu, K, Werner, A, Koch, M, Choi, A, et al. *New England Journal of Medicine*. 384:1486-1470. "[Serum Neutralizing Activity Elicited by mRNA-1273 Vaccine.](#)"
- xxvi Mackrael, K. May 10, 2021. *The Wall Street Journal*. "[How a Canadian Province Contained the \[Gamma P.1\] Covid-19 Variant.](#)"
- xxvii BCCDCa
- xxviii BCCDCc. June 1, 2021. "[COVID-19 Variants and Vaccines.](#)"