

COVID-19 Variant of Concern (VOC) Case Report

October 25, 2021

Cases reported here include cases with specimens sequenced at the Scientific Laboratory Division (SLD), University of New Mexico, Centers for Disease Control and Prevention (CDC), Aegis, LabCorp, Fulgent, and Gravity Genetics. Variants of concern (VOC) are defined by Centers for Disease Control and Prevention: <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/variant-surveillance/variant-info.html>.

COVID-19 Genomic Surveillance

Monitoring COVID-19 variants is an important part of epidemiologic surveillance to track the accumulation of SARS-CoV-2 mutations, which naturally occur over time. As the virus evolves, many variants will emerge and be identified; however, only a small minority will be classified as variants being monitored (VBM), variants of interest (VOI), or variants of concern (VOC). Variants are classified in these groups depending on whether the new mutations cause changes in transmissibility (i.e., how well the virus spreads between people), disease severity, detection by current diagnostic tests, or ability to evade monoclonal antibody treatments, natural immunity, or vaccine-induced immunity. Only a small proportion of COVID-19 cases have been sequenced since readily available diagnostic tests do not test for specific variant strains and must be sent to a lab for sequencing. Genetic sequencing requires coordinated effort and time, therefore there is a lag time from specimen collection to reporting of approximately 3-4 weeks.

CDC is monitoring one VOC currently in the US, Delta. All other VOCs and VOIs are now classified as VBMs due to their low prevalence including Alpha, Beta, Gamma, Epsilon, Eta, Iota, Kappa, Zeta, and Mu. The week of September 20, 2021, B.1.617.2 (Delta) represented approximately 99% of sequenced samples in New Mexico. Sequenced specimens reported from September 27-October 18, 2021 are incomplete but do indicate a continued predominance of Delta. CDC currently classifies all AY sublineage variants in combination with B.1.617.2 (Delta); however, AY.1 and AY.2 are reported separately due to a unique spike protein mutation (K417N). Studies indicate that vaccines authorized for use in the US are effective at preventing transmission, severe illness, and death caused by VOCs, including B.1.617.2 (Delta), and are the recommended measure to slow the emergence of new variants. Beginning August 20, 2021, NMDOH reinstated wearing masks in all indoor public settings to slow the spread of the highly transmissible Delta variant.

NM COVID-19 Variant Epidemiologic Interpretation

CDC VARIANTS OF CONCERN (VOC)			
Name	First Identified	Attributes ¹	New Mexico ²
Delta (B.1.617.2 and AY lineages)	India	-Increased transmissibility -May reduce effectiveness of antibody treatments -May cause more severe illness in unvaccinated persons -May reduce natural and vaccine immunity	-Since 6/28/21, Delta has remained the dominant VOC, and represented 99% of sequences reported on 9/20/21. -Proportion of deaths is currently 3%.

CDC VARIANTS BEING MONITORED (VBM)			
Name³	First Identified	Attributes¹	New Mexico²
Alpha (B.1.1.7 and Q lineages)	United Kingdom	-50% more transmissible -Potential to cause more severe cases and deaths	-Alpha has proportionally declined from 78% the week of 5/24/21 to 3% of samples collected the week of 7/19/21. -Has not been observed in NM since 8/30/21.
Beta (B.1.351 and descendent lineages)	South Africa	-50% more transmissible -Reduced effectiveness of antibody treatments -Reduced response of natural and vaccine induced immunity	- Least reported VOC in NM.
Gamma (P.1 and descendent lineages)	Japan/Brazil	-Reduced effectiveness of some antibody treatments -Reduced response of natural and vaccine immunity	-First case sequenced in NM the week of 3/22/21 and has not been observed since 8/9/2021; Gamma peaked at 10% of sequenced NM specimens the week of 6/21/2021. -Currently has the highest proportion of hospitalizations (24%); oversampling of severe cases may skew these results.
Epsilon (B.1.427, and B.1.429)	California	-Downgraded from a VOI on September 21, 2021	-First case sequenced in NM the week of 10/12/20 and has not been observed since 6/7/21; Epsilon peaked at 25% of sequenced NM specimens the week of 3/15/21.
Iota (B.1.526)	U.S.	-Downgraded from a VOI on September 21, 2021	-First case sequenced in NM the week of 2/22/21 and has not been observed since 7/12/21; Iota peaked at 10% of sequenced NM specimens the week of 5/31/21
Mu (B.1.621, and B.1.621.1)	Colombia	-Designated a VBM on September 21, 2021	-First case sequenced in NM the week of 5/24/21 and has not been observed since 7/26/21; Mu peaked at 7% of sequenced NM specimens the week of 6/7/21.

¹<https://www.cdc.gov/coronavirus/2019-ncov/variants/variant-info.html>

²NM interpretations based on data collected >4 weeks ago to allow for lag in genomic sequencing.

³All other VBMs have either not been observed in NM or have had <10 sequenced specimens and are not included in this table.

Cumulative number of Specimens Sequenced and Matched to Case Investigations

Lineage	Sequenced Cases	Matched Cases*	Percent Matched
Delta	4847	3288	68%
Alpha	1826	1558	85%
Beta	8	3	38%
Gamma	108	95	88%
Epsilon	517	426	82%
Eta	4	4	100%
Iota	87	73	84%
Kappa	2	2	100%
Zeta	3	2	67%
Mu	37	29	78%
Other lineage	4301	3338	78%
Total	11740	8818	75%

*Cases are matched to NMDOH case investigation data to provide demographic, disease outcome, and other clinical information. This table includes 176 sequences from patients who were tested at New Mexico facilities but reside outside New Mexico. These have been removed from the subsequent tables and figure

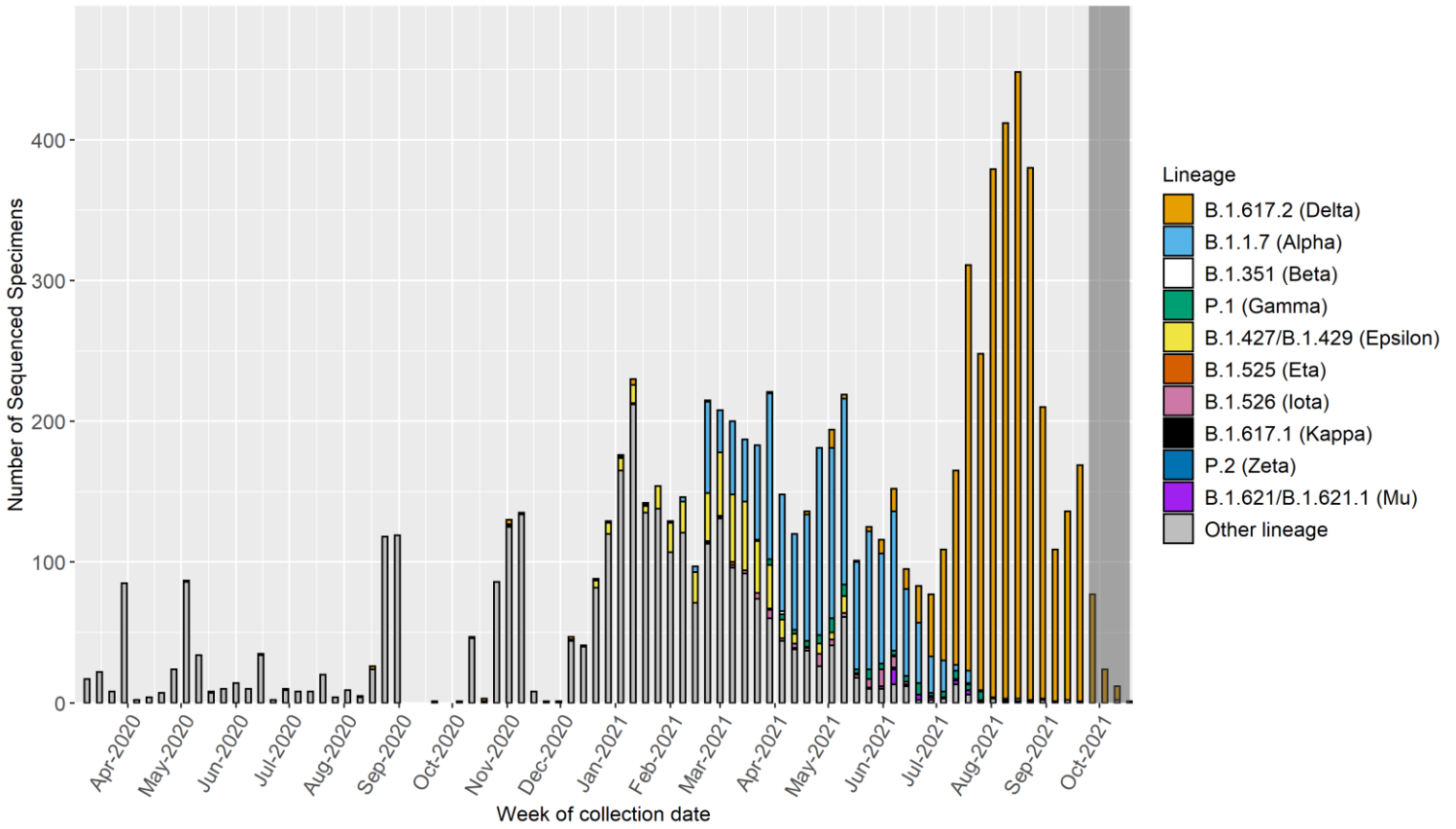
Cumulative number of variant cases, hospitalizations, and deaths

Lineage	Total Cases	Number Hospitalized	Percent Hospitalized	Number Died	Percent Died	Vaccine Breakthrough Cases*
Delta	3236	361	11%	81	3%	977
Alpha	1541	151	10%	20	1%	94
Beta	3	0	0%	0	0%	0
Gamma	93	22	24%	2	2%	3
Epsilon	415	9	2%	2	0%	8
Eta	4	0	0%	0	0%	0
Iota	71	3	4%	0	0%	4
Kappa	2	0	0%	0	0%	0
Zeta	2	0	0%	0	0%	0
Mu	29	1	3%	0	0%	3
Other lineage	3246	210	6%	66	2%	29

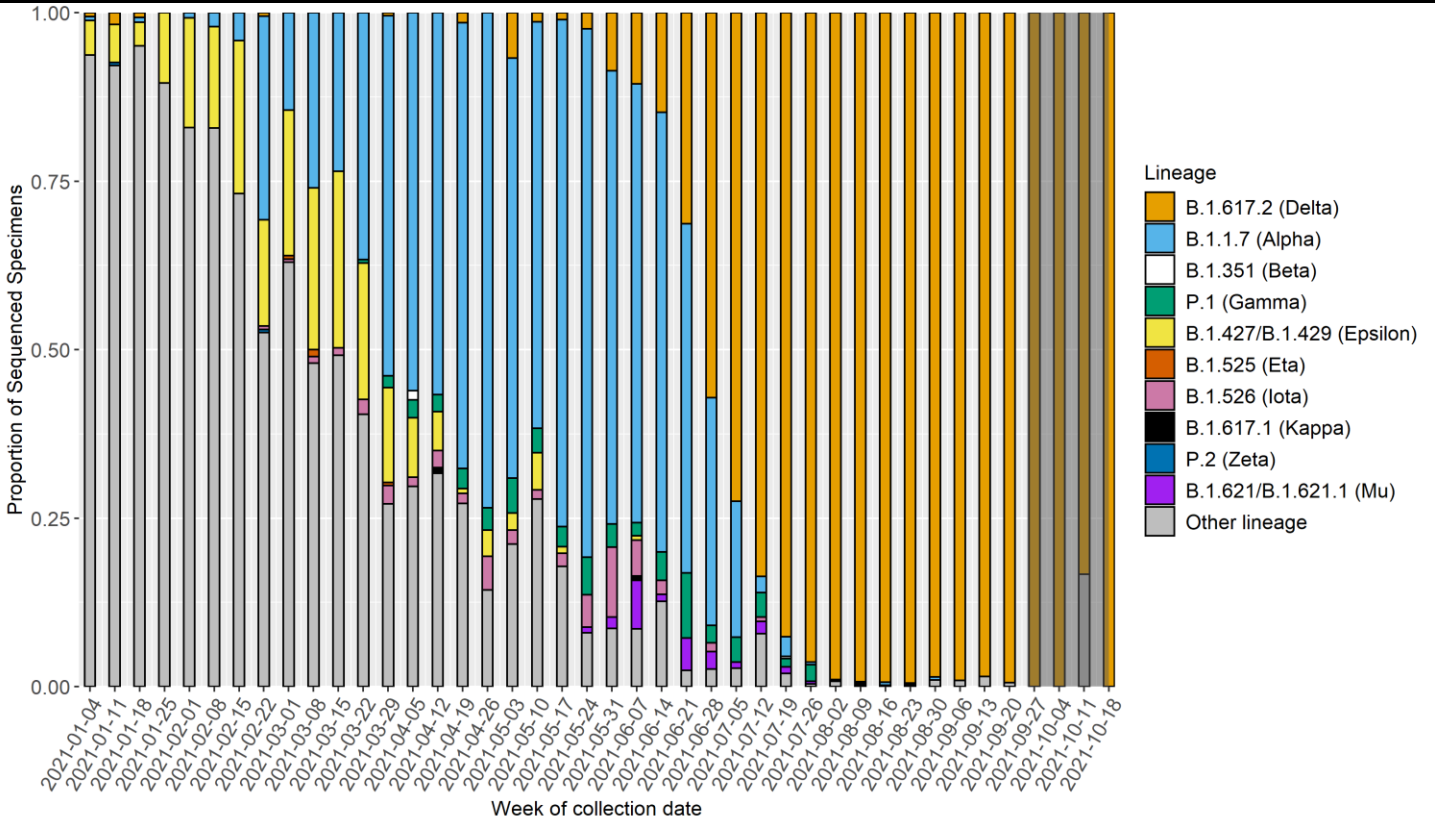
*A vaccine breakthrough (VBT) case is defined as a person who tests positive ≥ 14 days after completing the full series of an FDA-authorized COVID-19 vaccine and has not tested positive the prior 89 days. Because samples collected from VBT cases are more frequently sequenced compared to samples from other COVID-19 cases, these counts should not be used to evaluate the frequency with which VOCs cause vaccine breakthrough.

**The specimen submission process for sequencing is not representative. A large proportion of P.1 (Gamma) cases were collected from a single hospital in San Juan County that submitted specimens on hospital admissions, rather than on a representative set of cases in the county. This is likely increasing the apparent severity of this VOC.

Identified SARS-CoV-2 lineages by week

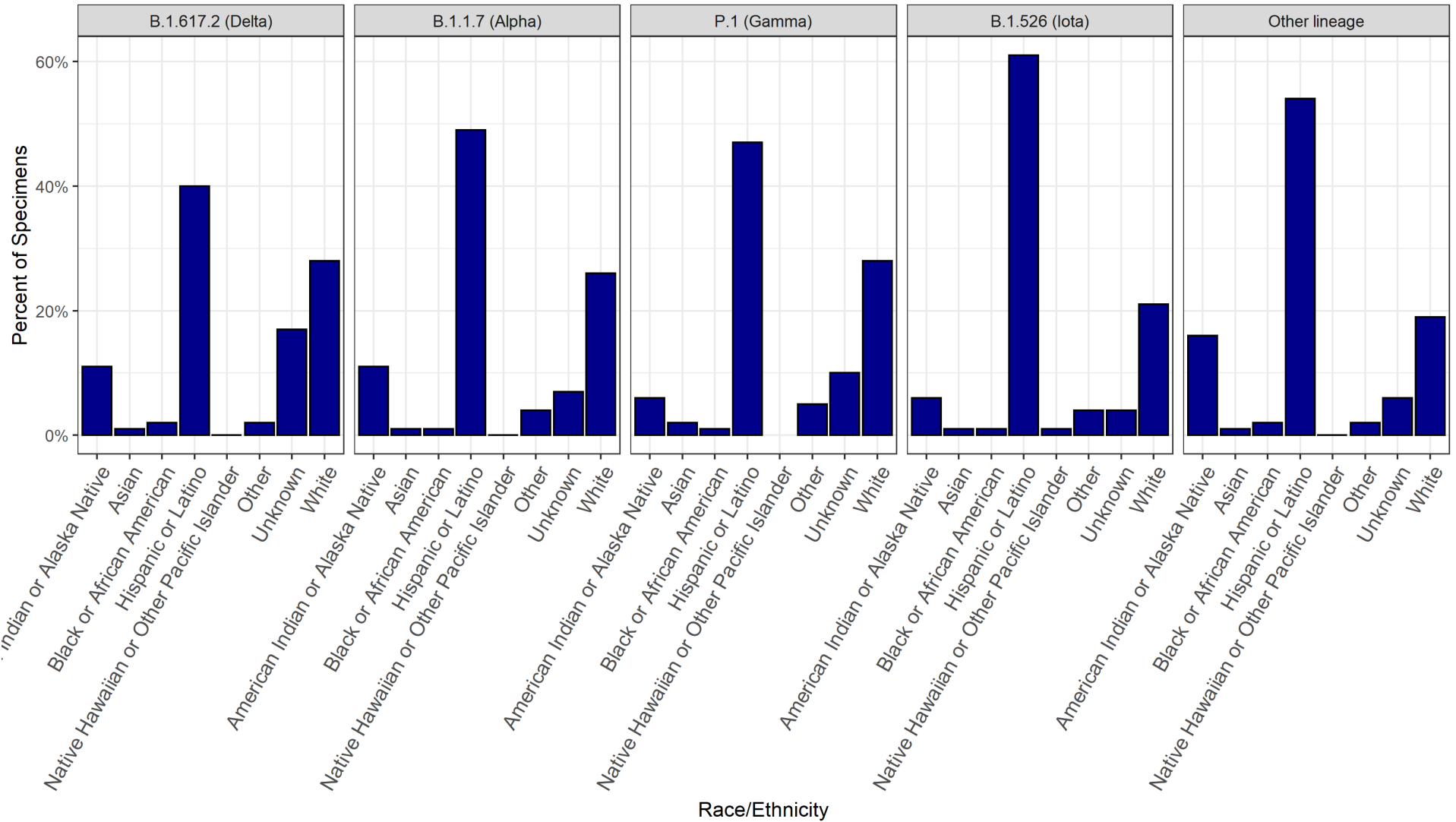


Proportion of identified SARS-CoV-2 lineages by week



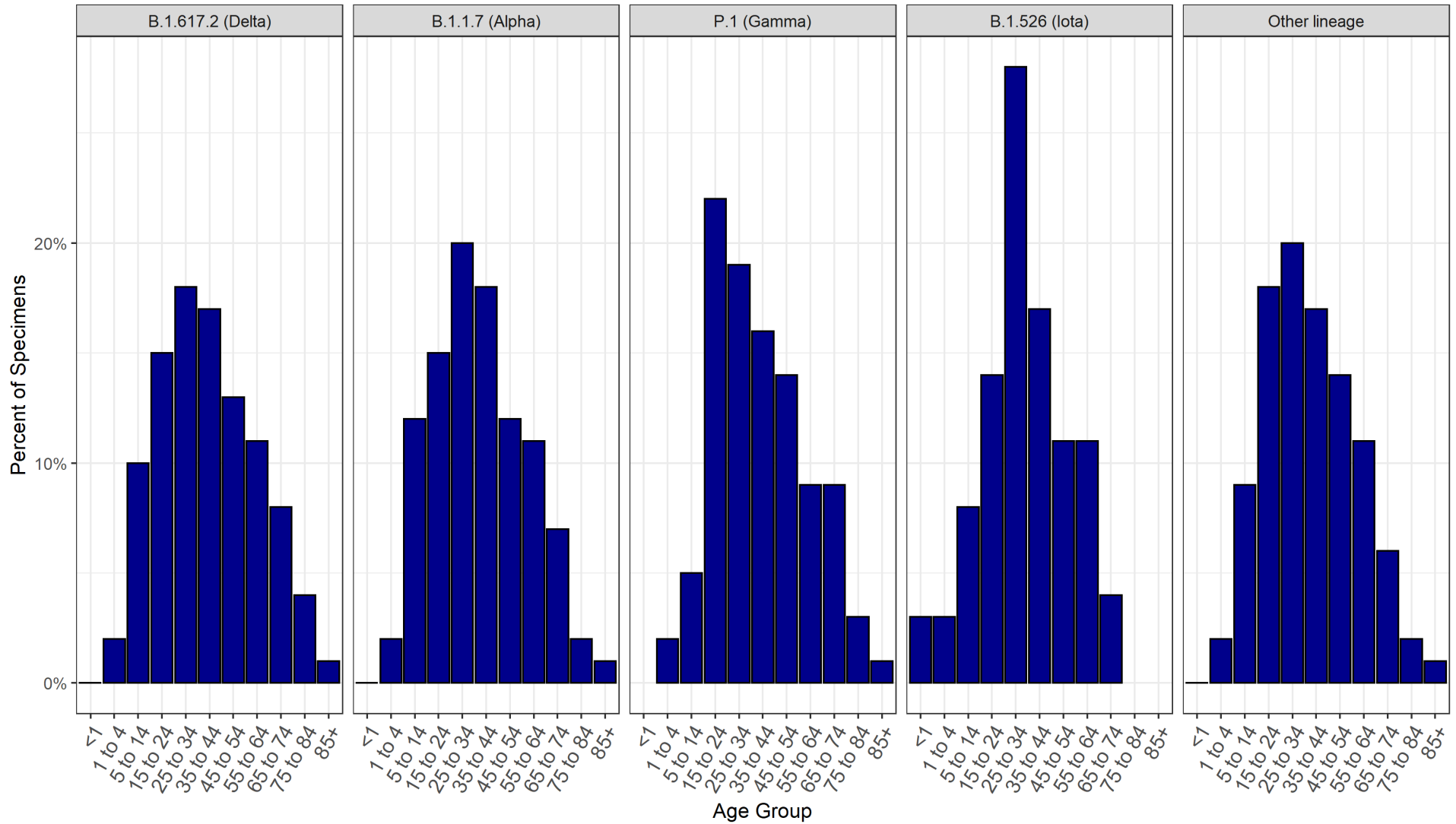
*The dark grey shaded region in each of the figures on this page represents the lag period between specimen collection and genomic sequencing results such that the results may look different when all specimens available for sequencing have been reported.

Cumulative proportion of variant cases by Race/Ethnicity



*Only VOCs and VBMs with greater than 50 sequenced specimens in NM are reported and excludes Epsilon due to its diminishing proportion over time.

Cumulative proportion of variant cases by Age Group



*Only VOCs and VBMs with greater than 50 sequenced specimens in NM are reported and excludes Epsilon due to its diminishing proportion over time.

Cumulative number of variant cases by county of residence*

Counties with less than 5 matched sequenced cases are not included in the table below.

County	Delta	Alpha	Gamma	Iota	Other lineage
Bernalillo	946	450	17	18	1085
Chaves	117	13	0	0	61
Cibola	87	13	0	1	115
Colfax	86	24	0	0	30
Curry	87	24	0	10	28
Dona Ana	185	82	6	0	425
Eddy	201	20	0	5	98
Grant	21	13	2	0	35
Guadalupe	49	1	0	0	19
Hidalgo	8	0	0	0	1
Lea	81	16	1	0	113
Lincoln	26	5	4	1	58
Los Alamos	22	9	0	0	24
Luna	8	14	0	0	20
McKinley	53	19	0	0	126
Otero	222	25	2	1	152
Quay	16	3	1	2	0
Rio Arriba	60	92	1	1	39
Roosevelt	4	0	0	0	12
San Juan	234	321	28	2	299
San Miguel	90	10	0	0	55
Sandoval	177	75	6	7	237
Santa Fe	200	97	0	5	296
Sierra	8	5	0	0	5
Socorro	34	9	0	0	30
Taos	30	16	0	0	40
Torrance	42	16	1	15	57
Valencia	116	69	5	3	120

*Only VOCs and VBMs with greater than 50 sequenced specimens in NM are reported and excludes Epsilon due to its diminishing proportion over time.

Percentage of variant cases reporting any symptoms

Lineage	No Symptoms	Unknown Symptoms	Yes Symptoms	Total Cases	Percent Symptomatic
Delta	90	1447	1699	3236	53%
Alpha	105	377	1059	1541	69%
Gamma	10	17	66	93	71%
Iota	4	22	45	71	63%
Other lineage	398	854	2449	3701	66%

Percentage of specific symptoms reported by symptomatic variant cases

The table below includes data ONLY from symptomatic cases.

Symptom	Delta	Alpha	Gamma	Iota	Other lineage
Fever (Measured or Subjective)	56% (935)	46% (484)	49% (32)	51% (23)	43% (1038)
Chills	47% (782)	46% (479)	58% (38)	51% (23)	45% (1082)
Muscle Aches	56% (937)	57% (593)	55% (36)	53% (24)	56% (1347)
Runny Nose	54% (904)	53% (551)	46% (30)	56% (25)	53% (1286)
Sore Throat	45% (757)	45% (466)	48% (31)	44% (20)	43% (1030)
Cough	75% (1259)	74% (769)	85% (55)	69% (31)	64% (1548)
Shortness of Breath	30% (502)	29% (307)	40% (26)	36% (16)	24% (586)
Nausea/Vomiting	26% (440)	28% (287)	34% (22)	38% (17)	23% (551)
Headache	65% (1094)	66% (685)	51% (33)	82% (37)	65% (1579)
Abdominal Pain	14% (239)	16% (163)	15% (10)	20% (9)	14% (339)
Diarrhea	29% (494)	29% (298)	26% (17)	36% (16)	26% (640)
Fatigue	68% (1136)	70% (732)	69% (45)	87% (39)	66% (1591)
Loss of Appetite	39% (652)	40% (420)	35% (23)	47% (21)	36% (870)
Loss of Taste or Smell	47% (795)	39% (407)	35% (23)	51% (23)	44% (1061)

* Only VOCs and VBMs with greater than 50 sequenced specimens in NM are reported and excludes Epsilon due to its diminishing proportion over time.

Percentage of variant cases reporting underlying conditions

Lineage	No	Unknown	Yes	Total Cases	Percent with underlying conditions
Delta	386	2293	557	3236	17%
Alpha	614	389	538	1541	35%
Gamma	40	17	36	93	39%
Iota	24	24	23	71	32%
Other lineage	1682	947	1072	3701	29%

Percentage of specific underlying conditions reported by variant cases

Data below includes ONLY cases who report having a pre-existing condition.

Condition	Delta	Alpha	Gamma	Iota	Other lineage
Chronic Lung Disease	26% (134)	25% (131)	27% (8)	14% (3)	27% (254)
Chronic Liver Disease	4% (20)	3% (16)	0% (0)	0% (0)	4% (38)
Chronic Renal Disease	9% (45)	4% (20)	7% (2)	0% (0)	5% (44)
Diabetes Mellitus	29% (148)	19% (99)	13% (4)	9% (2)	22% (207)
Cardiovascular Disease	35% (176)	32% (165)	30% (9)	23% (5)	28% (268)
Autoimmune Disease	7% (35)	8% (40)	7% (2)	5% (1)	5% (45)
Neurological Disability	6% (31)	6% (31)	13% (4)	0% (0)	9% (82)
Current or Former Smoker	43% (218)	54% (281)	73% (22)	64% (14)	50% (480)

* Note: One P.1 variant case reported an underlying condition that is not included on the list above.

** Only VOCs and VBM with greater than 50 sequenced specimens in NM are reported and excludes Epsilon due to its diminishing proportion over time.

Data Sources

- **COVID-19 data**
 - **New Mexico Electronic Disease Surveillance System (NM-EDSS)**, Infectious Disease Epidemiology Bureau, Epidemiology and Response Division, New Mexico Department of Health.
 - **Salesforce/MTX COVID-19 Case Investigation Platform.**
- **Sequencing data**
 - New Mexico Department of Health (NMDOH) receives sequencing data for specimens sequenced at the NMDOH Scientific Laboratory Division (SLD), University of New Mexico, Centers for Disease Control and Prevention (CDC), Aegis, LabCorp, Fulgent Genetics, and Gravity Genetics
- **Variants of concern (VOC)** are defined by Centers for Disease Control and Prevention:
<https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/variant-surveillance/variant-info.html>.

Data Notes

- **The data reported in this weekly update may not match the daily numbers that are reported in the New Mexico Department of Health (NMDOH) press releases and/or the NMDOH COVID-19 data dashboard. This may be due to variation in the date and time of data extraction from NM-EDSS, corrections after quality assurance review, and differences in the exclusion criteria.**
- **New Mexico Electronic Disease Surveillance System (NM-EDSS).** Disease incidence data are derived from reports of notifiable infectious diseases. NMDOH relies on health care providers, laboratories, hospitals, clinics, institutions, and individuals to report suspected and confirmed notifiable infectious diseases in accordance with New Mexico Administrative Code 7.4.3.13. Under-reporting can occur due to lack of awareness about reporting requirements or lack of compliance with those requirements. Not all cases of infectious diseases can be detected for various reasons including lack of access to health care services, lack of laboratory testing or concerns about confidentiality. Specific and standardized national case definitions are used to classify disease reports by case status.
- **Race/Ethnicity.** Race/Ethnicity are reported as a single variable according to the selection of the case. Any case who is Hispanic is in the Hispanic category and all other races are non-Hispanic.