COVID-19 Variant of Concern (VOC) Case Report

December 20, 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, Gravity, and Helix 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 two VOCs currently in the US, Delta and Omicron. 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. CDC designated B.1.1.529 (Omicron) a VOC on November 30, 2021. The first confirmed Omicron case was identified in NM December 12, 2021. The week of November 8, 2021, Delta represented approximately 100% of sequenced samples in New Mexico. Sequenced specimens reported from November 22-December 13, 2021 are incomplete but do indicate a continued predominance of Delta. CDC Nowcast predictive modeling forecasts Omicron to represent 73% of US positive cases the week of 12/18/21.[4] CDC currently classifies all AY sublineage variants in combination with B.1.617.2 as Delta. Studies indicate that vaccines authorized for use in the US are effective at preventing transmission, severe illness, and death caused by VOCs 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 emerging variants of COVID-19.

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 sublineages)	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 variant, and represented 100% of sequences reported on 11/8/21. -Proportion of deaths is currently 2%.
Omicron (B.1.1.529 and BA sublineages)	South Africa	-Potential increased transmissibility -May reduce effectiveness of antibody treatments -May reduce natural and vaccine immunity	-First case observed in NM 12/12/21.

CDC VARIANTS BEING MONITORED (VBM)			
Name[3]	First Identified	Attributes[1]	New Mexico[2]
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 79% the week of 5/24/21 to 2% of samples collected the week of 7/19/21. -Has not been observed in NM since 8/16/21.
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. -Has not been observed in NM since 7/19/21.
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 26% 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 2/08/21 and has not been observed since 6/28/21; Iota peaked at 15% of sequenced NM specimens the week of 5/10/21
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 8/16/21; 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
[2] NM interpretations based on data collected >4 weeks ago to allow for lag in genomic sequencing.
[3] All other VBMs have either not been observed in NM or have had <10 sequenced specimens and are not included in this table.
[4] CDC COVID Data Tracker

Cumulative number of Specimens Sequenced and Matched to Case Investigations

Lineage	Sequenced Cases	Matched Cases*	Percent Matched
B.1.617.2 (Delta)	9821	8569	87%
B.1.1.529 (Omicron)	1	0	0%
B.1.1.7 (Alpha)	1836	1556	85%
B.1.351 (Beta)	8	3	38%
P.1 (Gamma)	109	95	87%
B.1.427/B.1.429 (Epsilon)	521	429	82%
B.1.525 (Eta)	4	4	100%
B.1.526 (Iota)	191	164	86%
B.1.617.1 (Kappa)	2	2	100%
P.2 (Zeta)	3	2	67%
B.1.621/B.1.621.1 (Mu)	38	30	79%
Other lineage	4514	3249	72%
Total	**17047**	**14103**	**83%**

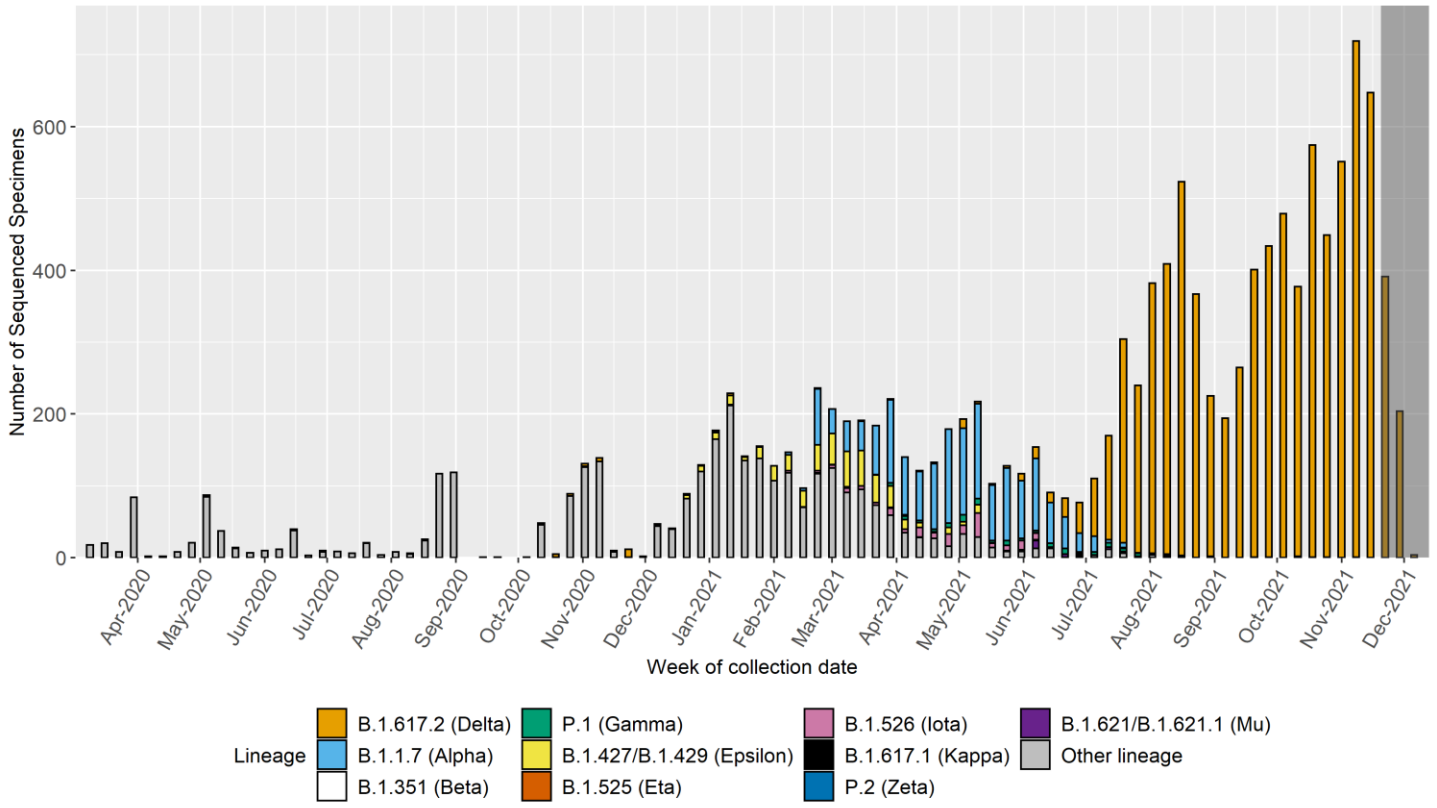
*Cases are matched to NMDOH case investigation data to provide demographic, disease outcome, and other clinical information. This table includes 195 sequences from patients who were tested at New Mexico facilities but reside outside New Mexico. These have been removed from the subsequent tables and figure

Cumulative number of variant cases, hospitalizations, and deaths

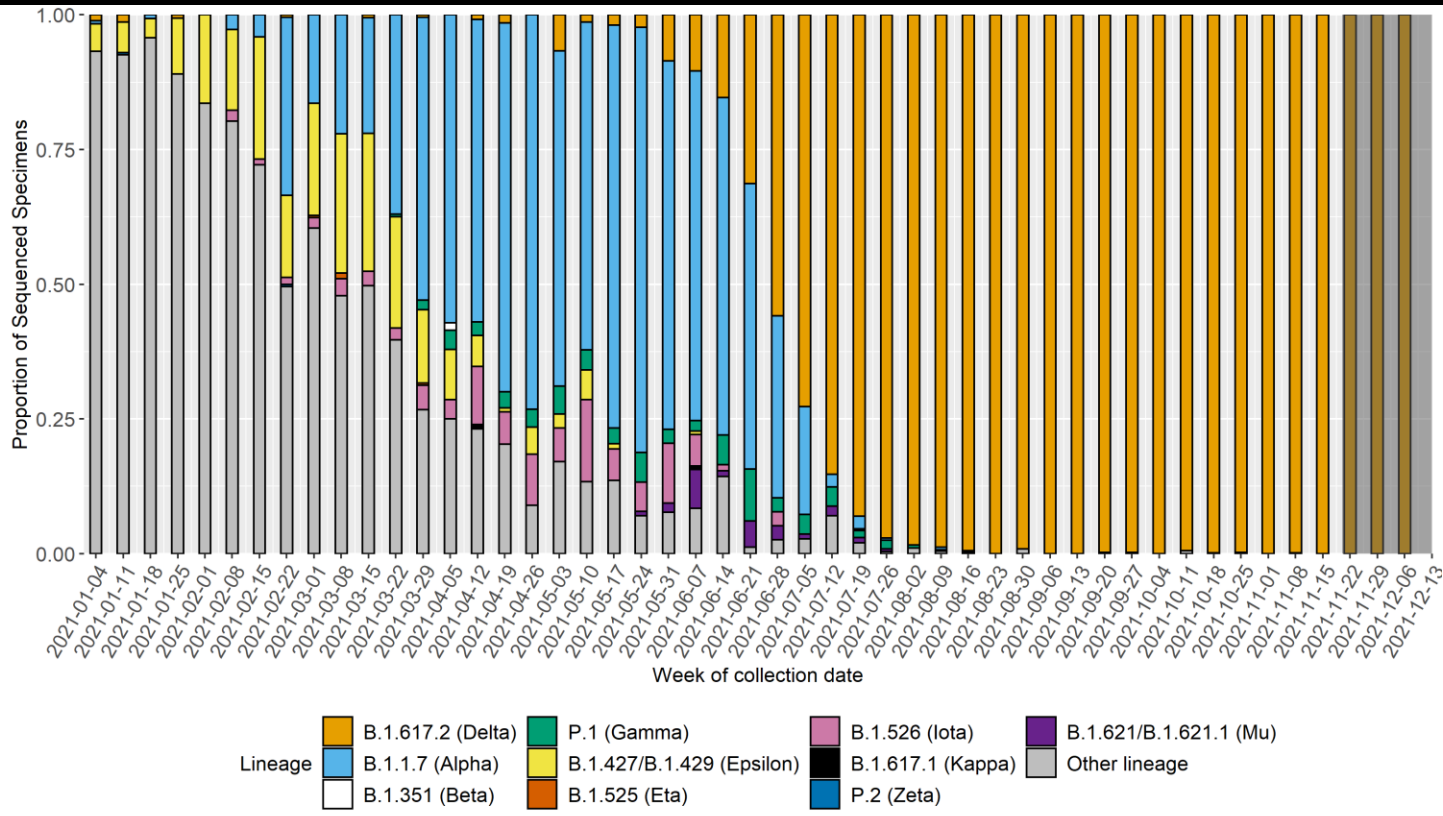
Lineage	Total Cases	Number Hospitalized	Percent Hospitalized	Number Died	Percent Died	Vaccine Breakthrough Cases*
Delta	8500	657	8%	141	2%	2827
Alpha	1539	158	10%	20	1%	94
Beta	3	0	0%	0	0%	0
Gamma	93	22	24%	2	2%	3
Epsilon	418	9	2%	2	0%	8
Eta	4	0	0%	0	0%	0
Iota	162	5	3%	1	1%	8
Kappa	2	0	0%	0	0%	0
Zeta	2	0	0%	0	0%	0
Mu	30	2	7%	0	0%	4
Other lineage	3151	208	7%	65	2%	24

*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.

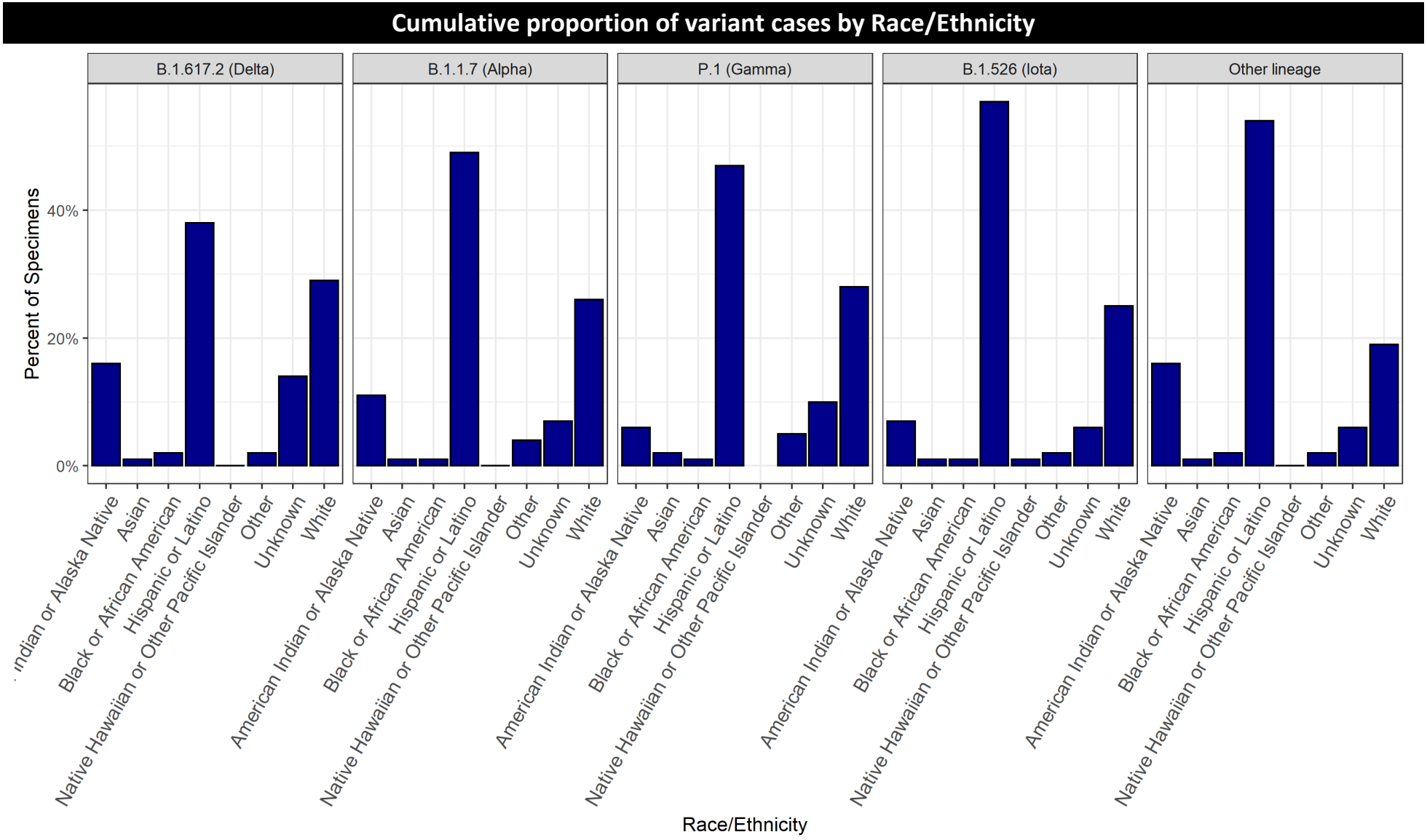
Identified SARS-CoV-2 lineages by week



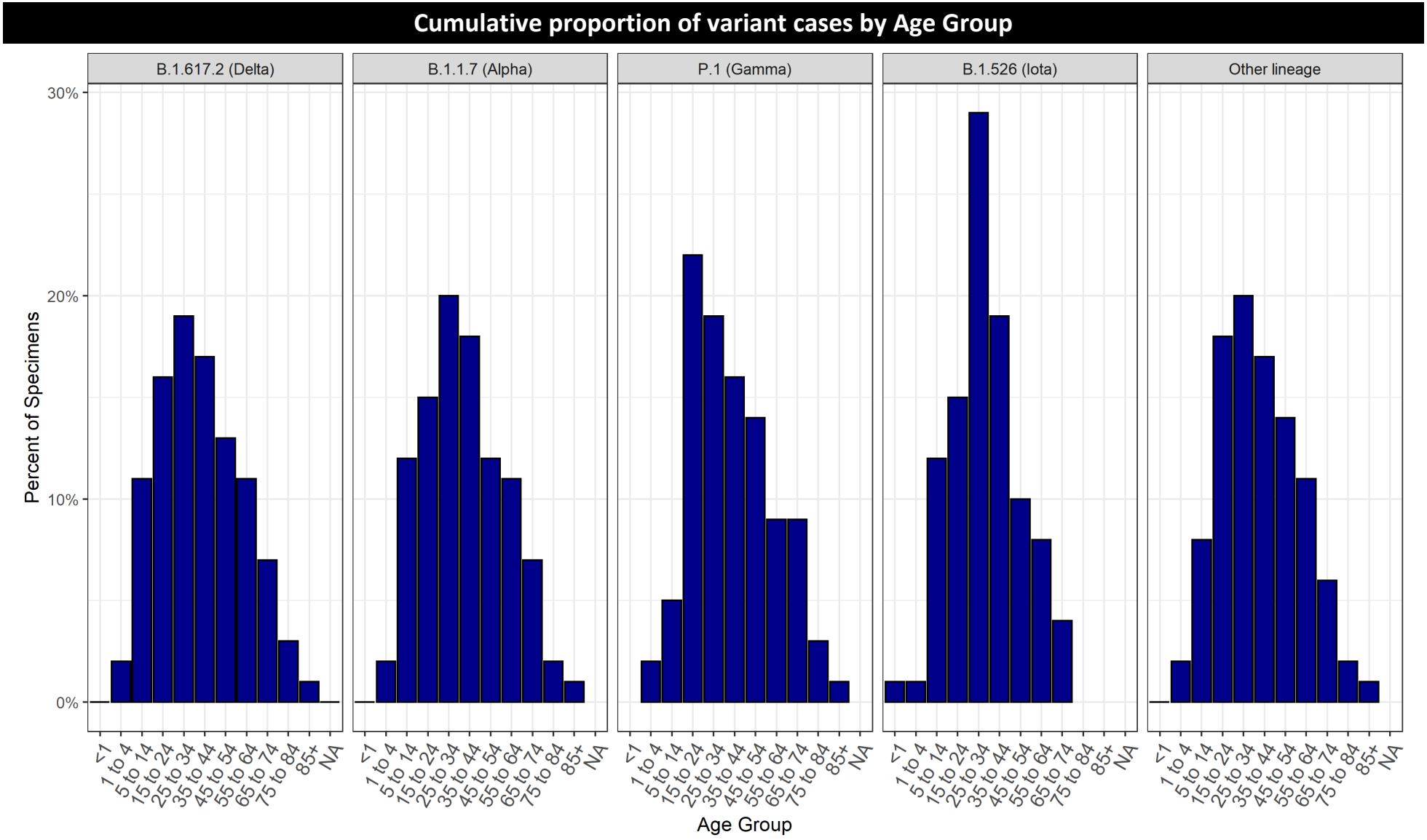
Proportion of identified SARS-CoV-2 lineages by week



*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.



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



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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	2502	450	17	50	1055
Chaves	195	13	0	1	59
Cibola	172	13	0	7	108
Colfax	128	24	0	4	26
Curry	121	24	0	10	28
Dona Ana	612	81	6	2	425
Eddy	250	19	0	5	97
Grant	69	13	2	1	34
Guadalupe	56	1	0	0	19
Hidalgo	12	0	0	0	1
Lea	128	16	1	0	114
Lincoln	44	5	4	1	58
Los Alamos	42	9	0	0	24
Luna	34	14	0	0	21
McKinley	286	19	0	2	126
Otero	607	25	2	1	150
Quay	25	3	1	2	0
Rio Arriba	119	92	1	1	39
Roosevelt	6	0	0	1	11
San Juan	1345	320	28	3	298
San Miguel	95	10	0	0	55
Sandoval	502	75	6	11	233
Santa Fe	451	97	0	6	295
Sierra	89	5	0	0	5
Socorro	43	9	0	0	31
Taos	109	16	0	0	39
Torrance	94	16	1	50	22
Union	6	1	0	0	0
Valencia	310	70	5	4	120

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Percentage of variant cases reporting any symptoms

Lineage	No Symptoms	Unknown Symptoms	Yes Symptoms	Total Cases	Percent Symptomatic
Delta	228	4913	3359	8500	40%
Alpha	104	367	1068	1539	69%
Gamma	10	16	67	93	72%
Iota	10	61	91	162	56%
Other lineage	395	815	2404	3614	67%

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)	54% (1781)	46% (488)	50% (33)	47% (42)	43% (1016)
Chills	48% (1599)	46% (481)	58% (38)	53% (48)	44% (1053)
Muscle Aches	56% (1865)	57% (596)	55% (36)	58% (52)	56% (1318)
Runny Nose	56% (1861)	53% (553)	45% (30)	58% (52)	53% (1260)
Sore Throat	45% (1508)	45% (470)	47% (31)	51% (46)	42% (1002)
Cough	75% (2478)	74% (772)	83% (55)	72% (65)	64% (1513)
Shortness of Breath	29% (965)	29% (308)	39% (26)	33% (30)	24% (571)
Nausea/Vomiting	27% (887)	27% (285)	33% (22)	33% (30)	23% (536)
Headache	66% (2180)	66% (693)	50% (33)	82% (74)	65% (1541)
Abdominal Pain	14% (476)	16% (164)	15% (10)	20% (18)	14% (327)
Diarrhea	30% (982)	28% (299)	26% (17)	36% (32)	26% (622)
Fatigue	68% (2244)	70% (737)	67% (44)	80% (72)	66% (1558)
Loss of Appetite	40% (1322)	40% (420)	35% (23)	47% (42)	36% (848)
Loss of Taste or Smell	50% (1649)	39% (411)	35% (23)	54% (49)	44% (1034)

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Percentage of variant cases reporting underlying conditions

Lineage	No	Unknown	Yes	Total Cases	Percent with underlying conditions
Delta	2647	5058	795	8500	9%
Alpha	597	372	570	1539	37%
Gamma	39	17	37	93	40%
Iota	55	61	46	162	28%
Other lineage	1662	901	1051	3614	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	24% (161)	25% (130)	26% (8)	28% (12)	26% (245)
Chronic Liver Disease	4% (28)	3% (17)	0% (0)	0% (0)	4% (38)
Chronic Renal Disease	11% (75)	4% (20)	6% (2)	0% (0)	5% (44)
Diabetes Mellitus	34% (221)	19% (98)	13% (4)	12% (5)	22% (203)
Cardiovascular Disease	36% (236)	32% (164)	29% (9)	19% (8)	28% (265)
Autoimmune Disease	6% (39)	8% (40)	6% (2)	2% (1)	5% (45)
Neurological Disability	8% (51)	6% (31)	13% (4)	2% (1)	9% (81)
Current or Former Smoker	40% (262)	53% (274)	74% (23)	53% (23)	50% (468)

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

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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, Gravity, and Helix 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.
- **CDC COVID Data Tracker** CDC COVID Data Tracker

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 of 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.