COVID-19 Variant of Concern Case Report

September 26, 2022

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, Omicron. All other VOCs and VOIs are now classified as VBMs due to their low prevalence including Delta, Alpha, Beta, Gamma, Epsilon, Eta, Iota, Kappa, Zeta, and Mu. CDC designated Omicron a VOC on November 30, 2021. To date, 10,985 confirmed cases of Omicron have been sequenced in NM. Since the week of January 24, 2022, Omicron represented approximately 100% of sequenced samples in New Mexico. Sequenced specimens reported from August 29 to September 26, 2022 are incomplete but indicate a continued predominance of Omicron. CDC Nowcast predictive modeling forecasts Omicron to represent approximately 100% of US positive cases the week of September 24, 2022, and that BA.4 and BA.5 sublineages could represent approximately 99% of cases.[4] CDC currently classifies all BA sublineage variants as Omicron. Studies indicate that vaccines and vaccine booster doses 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.

NM COVID-19 Variant Epidemiologic Interpretation

CDC VARIANTS OF CONCERN (VOC)

Name	First Identified	Attributes[1]	New Mexico[2]
Omicron (B.1.1.529 and BA sublineages)	South Africa	-May increase transmissibility -May reduce effectiveness of antibody treatments -May reduce natural and vaccine immunity	-Omicron became the dominant variant 12/27/21 representing 66% of cases. -10,985 confirmed cases of Omicron have been sequenced in NM.

CDC VARIANTS BEING MONITORED (VBM)			
Name[3]	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	-Delta remained the dominant variant from the week of 6/28/21 (56%) to 12/20/21 (72%). -The first Delta was sequenced the week of 4/19/21 and has not been observed in NM since 2/21/22
Alpha (B.1.1.7 and Q lineages)	United Kingdom	-50% more transmissible -Potential to cause more severe cases and deaths	-Alpha remained the dominant variant from the week of 3/29/21 (50%) to 6/21/21 (51%). -The first Alpha was sequenced the week of 12/28/20 and 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 9% 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 27% 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 7/19/21; Iota peaked at 14% 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 5/3/21 and has not been observed since 9/27/21; 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
BA.1 (Omicron)	7063	6487	92%
BA.2 (Omicron)	2188	2101	96%
BA.4 (Omicron)	279	269	96%
BA.5 (Omicron)	1455	1400	96%
B.1.617.2 (Delta)	15644	14438	92%
B.1.1.7 (Alpha)	1870	1622	87%
B.1.351 (Beta)	10	5	50%
P.1 (Gamma)	108	94	87%
B.1.427/B.1.429 (Epsilon)	526	441	84%
B.1.525 (Eta)	5	5	100%
B.1.526 (Iota)	200	175	88%
B.1.617.1 (Kappa)	2	2	100%
P.2 (Zeta)	3	2	67%
B.1.621/B.1.621.1 (Mu)	35	32	91%
Other lineage	4045	3263	81%
Total	33433	30336	91%

*Cases are matched to NMDOH case investigation data to provide demographic, disease outcome, and other clinical information. This table includes 287 sequences from patients who were tested at New Mexico facilities but reside outside New Mexico. These have been removed from the subsequent tables and figures.

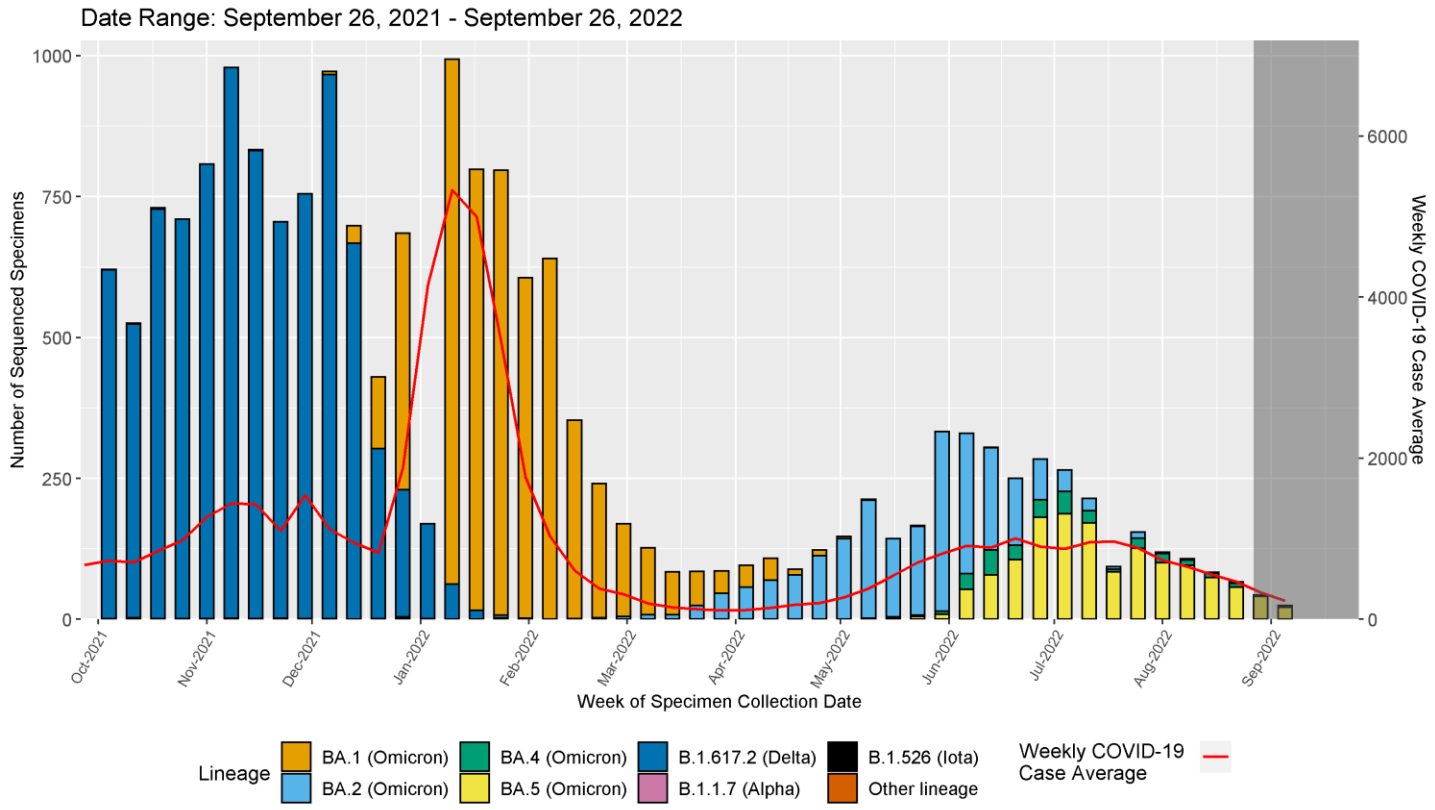
Health outcomes of cumulative matched specimens

Lineage	Total Matched Cases	Number Hospitalized (%)	Number Died (%)	Number Vaccine Breakthrough (%)*
BA.1 (Omicron)	6452	275 (4%)	59 (1%)	3632 (56%)
BA.2 (Omicron)	2088	153 (7%)	15 (1%)	1529 (73%)
BA.4 (Omicron)	269	14 (5%)	3 (1%)	191 (71%)
BA.5 (Omicron)	1393	83 (6%)	10 (1%)	998 (72%)
B.1.617.2 (Delta)	14335	1260 (9%)	458 (3%)	4432 (31%)
B.1.1.7 (Alpha)	1603	154 (10%)	21 (1%)	96 (6%)
B.1.351 (Beta)	5	0 (0%)	0 (0%)	0 (0%)
P.1 (Gamma)	92	22 (24%)	2 (2%)	4 (4%)
B.1.427/B.1.429 (Epsilon)	430	9 (2%)	2 (0%)	9 (2%)
B.1.525 (Eta)	5	0 (0%)	0 (0%)	0 (0%)
B.1.526 (Iota)	173	5 (3%)	1 (1%)	8 (5%)
B.1.617.1 (Kappa)	2	0 (0%)	0 (0%)	0 (0%)
P.2 (Zeta)	2	0 (0%)	0 (0%)	0 (0%)
B.1.621/B.1.621.1 (Mu)	32	1 (3%)	0 (0%)	5 (16%)
Other lineage	3167	196 (6%)	65 (2%)	26 (1%)

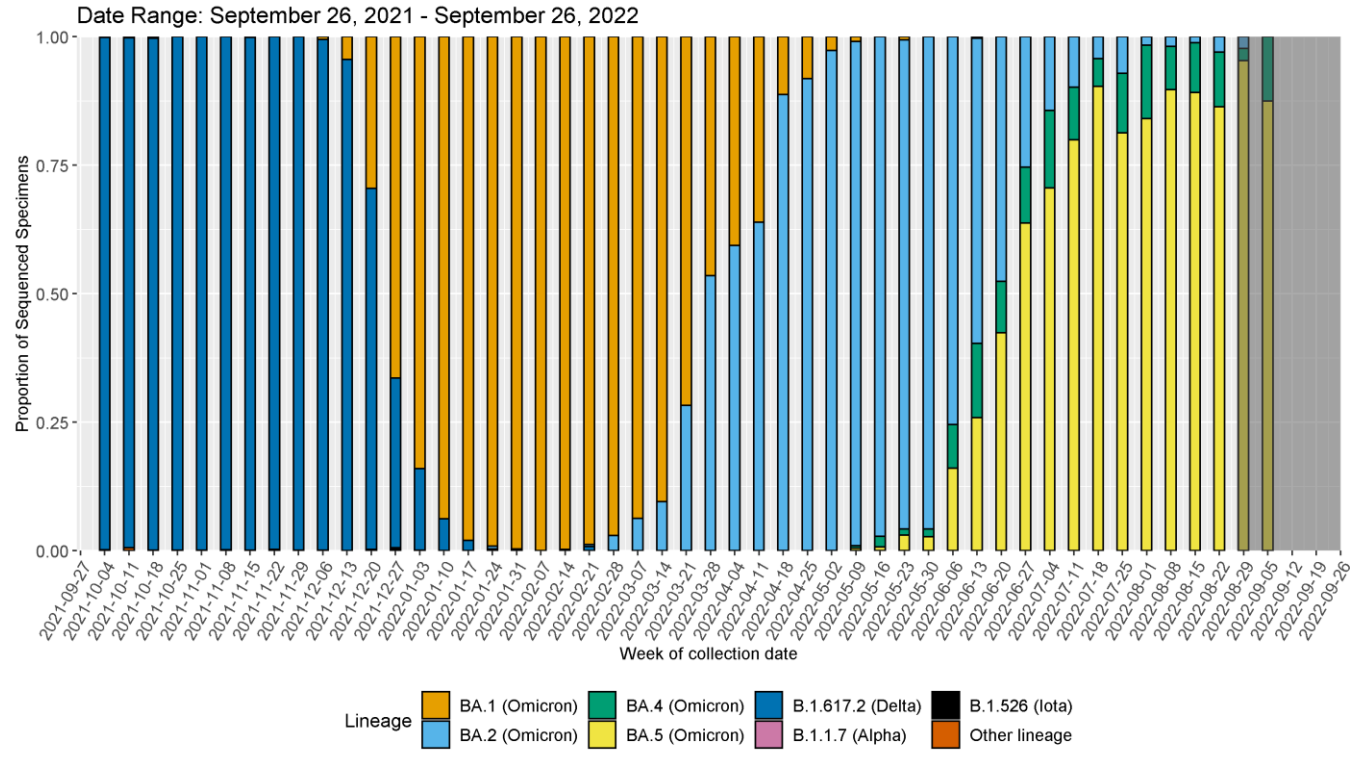
*A vaccine breakthrough (VBT) case is defined as a person who tests positive ≥14 days after completing the full series of an FDA-authorized COVID-19 vaccine and has not tested positive the prior 89 days. *Because samples collected from VBT cases are more frequently sequenced compared to samples from 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*



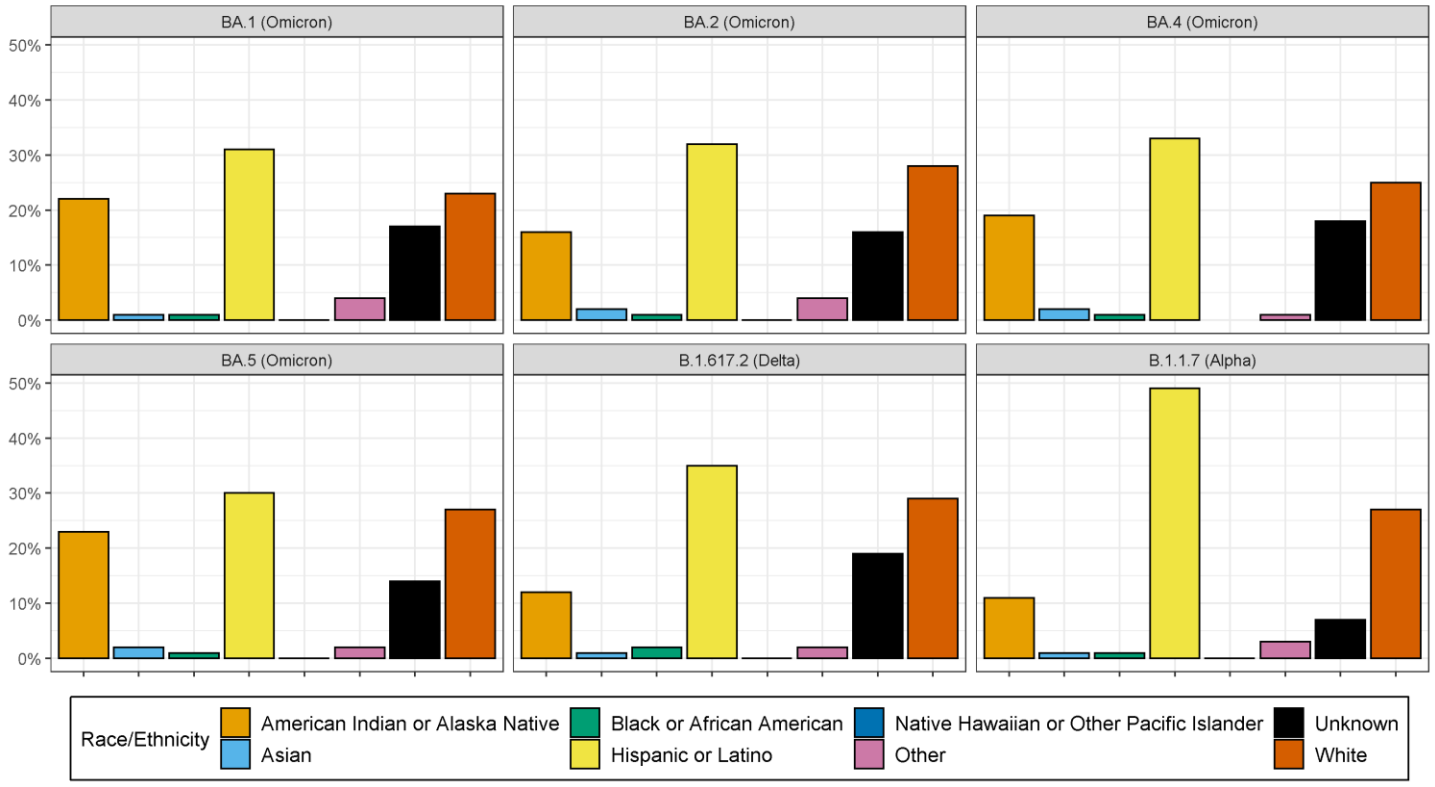
Proportion of identified SARS-CoV-2 lineages by week*



*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.

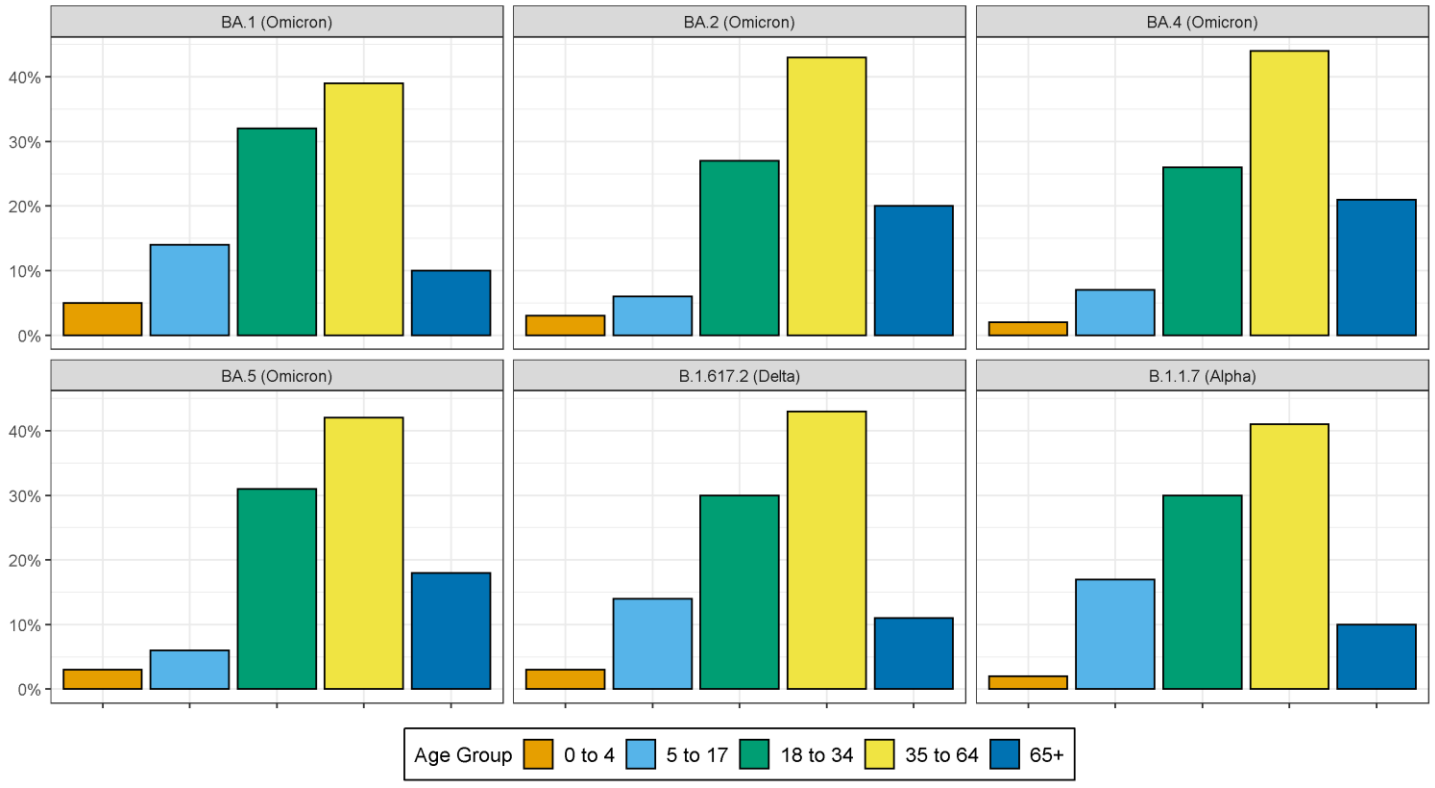
Cumulative proportion of variant cases by race/ethnicity

Cumulative up to September 26, 2022



Cumulative proportion of variant cases by age group

Cumulative up to September 26, 2022



Cumulative number of variant cases by county of residence*

County	BA.1 (Omicron)	BA.2 (Omicron)	BA.4 (Omicron)	BA.5 (Omicron)	B.1.617.2 (Delta)	B.1.1.7 (Alpha)
Bernalillo	2438	818	116	541	4818	471
Chaves	57	9	5	31	354	13
Cibola	208	125	12	32	292	14
Colfax	38	4	1	1	221	28
Curry	117	60	2	20	337	30
Dona Ana	300	87	17	91	907	85
Eddy	63	10	0	14	384	21
Grant	83	55	2	8	134	16
Guadalupe	22	0	0	0	67	1
Lea	31	3	0	5	226	17
Lincoln	44	28	1	16	119	6
Los Alamos	31	14	1	3	49	9
Luna	66	19	0	2	59	15
McKinley	341	5	1	10	360	19
Otero	216	33	6	9	782	26
Quay	12	4	0	3	79	4
Rio Arriba	105	79	9	30	202	95
Roosevelt	16	2	0	2	79	1
San Juan	975	203	39	285	1650	327
San Miguel	67	30	0	9	160	10
Sandoval	439	226	24	133	972	77
Santa Fe	351	164	24	91	748	101
Sierra	32	14	2	7	124	5
Socorro	17	11	0	6	92	9
Taos	47	23	1	8	233	17
Torrance	47	12	0	5	176	16
Valencia	248	40	6	23	568	70

* Counties with less than 50 matched sequenced cases are not included in the table below. Excludes all VBMs other than Alpha and Delta.

Percentage of variant cases reporting any symptoms

Lineage	Total	Total Investigated (%)	No	Yes	Percent Symptomatic
BA.1 (Omicron)	6452	2237 (35%)	128	2109	94%
BA.2 (Omicron)	2088	1068 (51%)	44	1024	96%
BA.4 (Omicron)	269	107 (40%)	2	105	98%
BA.5 (Omicron)	1393	517 (37%)	22	495	96%
B.1.617.2 (Delta)	14335	5748 (40%)	388	5360	93%
B.1.1.7 (Alpha)	1603	1227 (77%)	117	1110	90%

Percentage of specific symptoms reported by symptomatic variant cases

The table below includes data only from symptomatic cases.

Symptom	BA.1 (Omicron)	BA.2 (Omicron)	BA.4 (Omicron)	BA.5 (Omicron)	B.1.617.2 (Delta)	B.1.1.7 (Alpha)
Upper Respiratory (Runny nose, sore throat)	1802 (85%)	886 (87%)	89 (85%)	426 (86%)	3513 (66%)	744 (67%)
Lower Respiratory (Cough, shortness of breath)	1731 (82%)	881 (86%)	92 (88%)	432 (87%)	4224 (79%)	844 (76%)
Gastrointestinal (Nausea/vomiting, abdominal pain, diarrhea)	871 (41%)	427 (42%)	51 (49%)	255 (52%)	2372 (44%)	476 (43%)
Systemic (Fever, chills, muscle aches, headache, fatigue, loss of appetite)	1903 (90%)	929 (91%)	98 (93%)	456 (92%)	4756 (89%)	980 (88%)
Loss of Taste and Smell	457 (22%)	203 (20%)	29 (28%)	118 (24%)	2582 (48%)	428 (39%)

* Excludes all VBMs other than Alpha and Delta.

Percentage of variant cases reporting underlying conditions

Lineage	Total	Total Investigated (%)	No	Yes	Percent Underlying Conditions
BA.1 (Omicron)	6024	1842 (31%)	1385	457	25%
BA.2 (Omicron)	1610	590 (37%)	158	432	73%
BA.4 (Omicron)	197	38 (19%)	10	28	74%
BA.5 (Omicron)	1073	181 (17%)	44	137	76%
B.1.617.2 (Delta)	14335	5627 (39%)	4319	1308	23%
B.1.1.7 (Alpha)	1603	1220 (76%)	628	592	49%

Percentage of specific underlying conditions reported by variant cases

Data below includes ONLY cases who report having a preexisting condition.

Symptom	BA.1 (Omicron)	BA.2 (Omicron)	BA.4 (Omicron)	BA.5 (Omicron)	B.1.617.2 (Delta)	B.1.1.7 (Alpha)
Chronic Lung Disease	116 (29%)	106 (30%)	4 (16%)	32 (29%)	248 (23%)	136 (26%)
Chronic Liver Disease	15 (4%)	18 (5%)	1 (4%)	5 (4%)	53 (5%)	18 (3%)
Chronic Renal Disease	43 (11%)	38 (11%)	2 (8%)	12 (11%)	126 (12%)	21 (4%)
Diabetes Mellitus	117 (30%)	94 (26%)	8 (32%)	41 (37%)	402 (38%)	96 (18%)
Cardiovascular Disease	155 (39%)	140 (39%)	8 (32%)	46 (41%)	388 (36%)	172 (32%)
Autoimmune Disease	13 (3%)	9 (3%)	1 (4%)	5 (4%)	62 (6%)	41 (8%)
Neurological Disability	45 (11%)	38 (11%)	5 (20%)	10 (9%)	81 (8%)	31 (6%)
Current or Former Smoker	167 (42%)	165 (46%)	11 (44%)	50 (45%)	361 (34%)	286 (54%)

* Excludes all VBMs other than Alpha and Delta.

**Beginning January 2022, case investigation interviews conducted via webform survey no longer collected underlying conditions, and have been excluded from the underlying conditions tables.

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**
  - Cases reported here include cases with specimens sequenced at the Scientific Laboratory Division (SLD), the University of New Mexico, and the following partnering labs with the Centers for Disease Control and Prevention (CDC): Aegis Sciences Corporation, Fulgent Genetics, Gravity Diagnostics, Helix/Illumina, LabCorp, Quest Diagnostics, and Infinity BiologiX (Sampled).
- **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.

- **Gender**. Gender refers to a person's internal sense of being male, female, some combination of male and female, or neither male nor female. Sex refers to the biological anatomy of an individual's reproductive system, and secondary sex characteristics.