

Variant and Breakthrough Cases

Figure 6 displays the percentage of the most common SARS-CoV-2 lineages detected each week, among all samples sequenced that were collected that week. There were 5,053 samples that were sequenced and had their lineages reported to [GISAID](https://gisaid.org/) since September 2020; figure 5 displays the number of specimens sequenced by week. A variant is a lineage that has one or more mutations that differentiate it from other lineages in circulation. CDC updated their COVID variant classification system recently. Delta is the only Variant of Concern at this time, and it is the dominant circulating strain in Montana. Of specimens collected and sequenced in September and October, 1,405/1,407 (99.9%) are Delta. Aside from Delta, all other former variants of concern and interest have been re-classified as Variants Being Monitored. The overall trends in variants shows that, March through June, the Alpha variant (light yellow) was predominant. Beginning in July, the Delta variant (dark orange) has been detected most often among sequenced samples and is currently the dominant variant in Montana.

Figure 5. Number of COVID-19 samples sequenced by collection date, Montana 10/19/2021 [n=5,053]

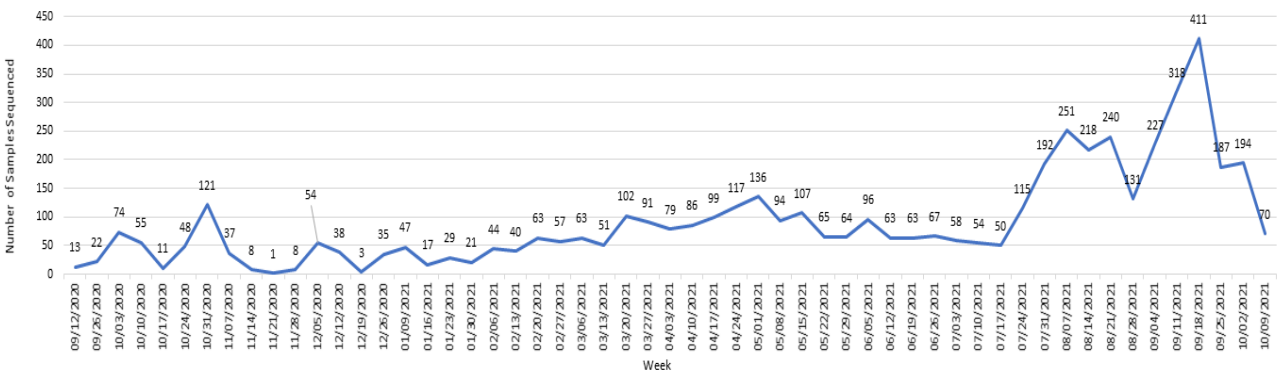
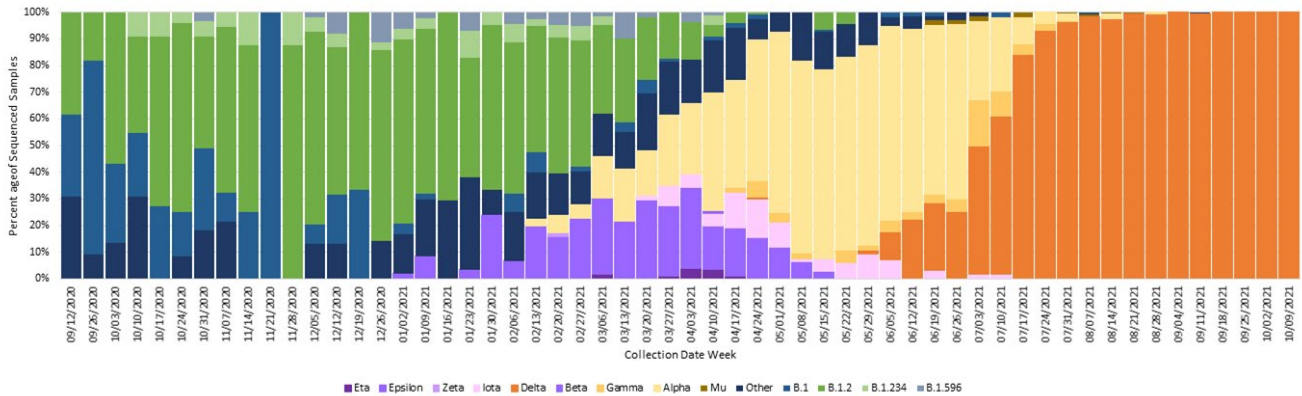


Figure 6. Percent of COVID-19 variants in sequenced samples by collection date, Montana 10/19/2021



A breakthrough COVID-19 infection is defined as a positive SARS-CoV-2 collected ≥ 14 days after completing the primary COVID-19 vaccine series of an FDA-authorized COVID-19 vaccine. Depending on the specific vaccine administered, completion of series could be one or two doses of vaccine. As of 10/19/21, Montana reports 9,744 cases of confirmed breakthrough disease, which includes 544 hospitalizations and 141 deaths. Over the past 8 weeks (August 21 – October 15) the number of cases among unvaccinated individuals was 4.7 times higher than the number of cases among vaccinated individuals; the number of hospitalizations and deaths among unvaccinated individuals were 4.8 and 3.5 times higher, respectively, compared to vaccinated individuals.

Hospitalizations and Deaths and Vaccination Status

COVID-19-related hospitalizations and deaths were analyzed between **April 1 and October 15** to review vaccination status. Since the beginning of April this year, 85% of Montanans who were hospitalized and 77% of those who died were unvaccinated at the time of infection (Table 3). Of the 3,451 individuals who were hospitalized during this time period, 53 (2%) were <18 years old, 573 (17%) were 18 to 44 years old, 1,201 (35%) were 45 to 64 years old and 1,624 (47%) were \geq 65 years old.

Additionally, COVID-19-related hospitalization and death data from **August 21 – October 15** (last 8 weeks) were analyzed to review vaccination status. Eighty-three percent of Montanans who were hospitalized and 78% of those who died had not received a COVID-19 vaccine (Table 4). Of the 2,046 individuals who were hospitalized during this time period, 36 (2%) were <18 years old, 354 (17%) were 18 to 44 years old, 707 (35%) were 45 to 64 years old and 949 (46%) were \geq 65 years old.

Table 3. Vaccination status of COVID-19 hospitalizations and deaths – April 1 to October 15, 2021

	HOSPITALIZATIONS	DEATHS
TOTAL REPORTED	3,451	556
UNVACCINATED	2,927 (85%)	427 (77%)
VACCINATED (BREAKTHROUGH CASE)	524 (15%)	129 (23%)
UNVACCINATED AGE RANGE IN YEARS (MEDIAN AGE)	<1-102 (61)	24-100 (71)
VACCINATED AGE RANGE IN YEARS (MEDIAN AGE)	16-101 (75)	43-99 (83)

Table 4. Vaccination status of COVID-19 hospitalizations and deaths – August 21 – October 15, 2021

	HOSPITALIZATIONS	DEATHS
TOTAL REPORTED	2,046	327
UNVACCINATED	1,692 (83%)	254 (78%)
VACCINATED (BREAKTHROUGH CASE)	354 (17%)	73 (22%)
UNVACCINATED AGE RANGE IN YEARS (MEDIAN AGE)	<1-99(60)	24-100 (70)
VACCINATED AGE RANGE IN YEARS (MEDIAN AGE)	16-101(74)	43-99 (83)

County name	Eligible population 12+	Dose 1	Dose 2	Dose 3	Fully Immunized	Total Doses Administered	Percent eligible with first dose (12+)	Percent Fully Vaccinated (12+)
BEAVERHEAD	8,412	4,902	3,973	101	4,614	8,976	58%	55%
BIG HORN	10,303	6,789	5,734	120	6,015	12,643	66%	58%
BLAINE	5,359	3,156	2,672	310	2,850	6,138	59%	53%
BROADWATER	5,443	2,058	1,491	53	1,711	3,602	38%	31%
CARBON	9,621	5,020	4,442	138	4,743	9,600	52%	49%
CARTER	1,051	338	305	5	322	648	32%	31%
CASCADE	68,949	37,621	30,741	3,275	34,215	71,637	55%	50%
CHOUTEAU	4,903	1,974	1,593	56	1,752	3,623	40%	36%
CUSTER	9,855	4,607	3,674	61	4,130	8,342	47%	42%
DANIELS	1,454	676	564	13	610	1,253	46%	42%
DAWSON	7,410	3,144	2,655	84	2,915	5,883	42%	39%
DEER LODGE	8,375	5,740	4,789	356	5,337	10,885	69%	64%
FALLON	2,330	955	838	7	877	1,800	41%	38%
FERGUS	9,561	4,879	4,172	223	4,526	9,274	51%	47%
FLATHEAD	88,987	45,988	36,745	4,074	40,473	86,807	52%	45%
GALLATIN	99,225	71,943	55,875	4,977	61,172	132,795	73%	62%
GARFIELD	1,066	295	234	0	273	532	28%	26%
GLACIER	10,794	9,061	6,044	73	6,527	15,178	84%	60%
GOLDEN VALLEY	703	325	274	21	304	620	46%	43%
GRANITE	3,071	1,345	1,058	40	1,161	2,443	44%	38%
HILL	13,256	7,832	6,276	227	7,084	14,335	59%	53%
JEFFERSON	10,702	5,972	5,111	613	5,486	11,696	56%	51%
JUDITH BASIN	1,747	702	603	72	657	1,377	40%	38%
LAKE	25,868	17,380	14,444	1,070	15,523	32,894	67%	60%
LEWIS & CLARK	59,541	39,293	32,985	5,606	35,581	77,884	66%	60%
LIBERTY	2,022	784	655	75	749	1,514	39%	37%
LINCOLN	17,763	8,446	6,931	423	7,532	15,800	48%	42%
MADISON	7,777	3,954	3,226	93	3,617	7,273	51%	47%
MCCONE	1,440	423	398	11	406	832	29%	28%
MEAGHER	1,638	926	791	14	858	1,731	57%	52%
MINERAL	3,889	2,334	1,674	82	2,111	4,090	60%	54%
MISSOULA	104,911	74,932	63,595	8,526	69,140	147,053	71%	66%
MUSSELSHELL	4,097	1,530	1,255	69	1,421	2,854	37%	35%
PARK	14,746	9,924	7,669	187	8,500	17,780	67%	58%
PETROLEUM	433	143	127	43	135	313	33%	31%
PHILLIPS	3,331	1,653	1,245	101	1,525	2,999	50%	46%
PONDERA	4,931	3,172	2,398	166	2,738	5,736	64%	56%
POWDER RIVER	1,510	447	362	7	406	816	30%	27%
POWELL	6,230	3,902	2,884	92	3,617	6,878	63%	58%
PRAIRIE	931	422	372	2	390	796	45%	42%
RAVALLI	38,686	21,850	17,962	1,701	20,085	41,513	56%	52%
RICHLAND	8,978	3,935	3,090	120	3,678	7,145	44%	41%
ROOSEVELT	8,436	4,484	3,361	14	3,885	7,859	53%	46%
ROSEBUD	7,211	4,770	3,764	78	4,227	8,612	66%	59%
SANDERS	10,768	4,452	3,841	86	4,071	8,379	41%	38%
SHERIDAN	2,847	1,788	1,534	62	1,658	3,384	63%	58%
SILVER BOW	30,125	21,408	18,516	2,598	19,670	42,522	71%	65%
STILLWATER	8,428	3,913	3,102	275	3,594	7,290	46%	43%
SWEET GRASS	3,273	1,532	1,203	37	1,410	2,772	47%	43%
TETON	5,160	2,704	1,837	50	2,236	4,591	52%	43%
TOOLE	4,055	2,077	1,605	90	1,955	3,772	51%	48%
TREASURE	584	346	254	2	274	602	59%	47%
VALLEY	6,313	2,964	2,384	138	2,744	5,486	47%	43%
WHEATLAND	1,823	692	617	66	654	1,375	38%	36%
WIBAUX	834	298	258	1	265	557	36%	32%
YELLOWSTONE	136,442	81,217	68,168	7,818	73,477	157,203	60%	54%
MONTANA	917,598	553,417	452,370	44,602	495,886	1,050,389	60%	54%