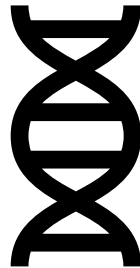
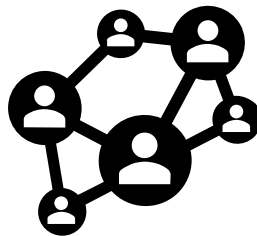


Alaska COVID Genomic Surveillance

Situation Report

6 April 2021



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Table of Contents

Executive Summary: Sequence Analysis of COVID-19 in Alaska	3
Table: Genomic Sequencing Effort in Alaska	3
Table: Vaccine Breakthrough Investigation	3
Variants of Concern	4
Variants of Interest	4
Variants Identified in Alaska	4
Variants of Concern, Individual Lineage Reports	5
B.1.1.7	5
P.1	5
B.1.351	6
B.1.429	6
Variants of Interest, Individual Lineage Reports	7
B.1.526	7
B.1.525	7
P.2	7
Lineages in Alaska	8
Lineages Over Time	8
Lineages by Alaska Location	9
Data Tables	10
Table: Lineages Over Time	10
Table: Lineages by Alaska Location	12
Additional Resources	13

Executive Summary: Sequence Analysis of COVID-19 in Alaska

- **810 cases of COVID-19 in Alaska sequenced** and released in a protected public database repository (GISAID: <https://www.gisaid.org/>).
- **New Variant of Concern (VOC) detected: B.1.351** (first identified in South Africa) now detected in the Anchorage/Mat-Su region.
- **New Variant of Interest (VOI) detected: B.1.526** (first identified in New York) now detected in the Anchorage-Mat Su region.
- **New Variant of Interest (VOI) detected: B.1.525** (first identified in New York) now detected in the Gulf Coast region.
- **Additional cases of VOC B.1.1.7 detected.** Additional cases are in the Anchorage-Mat Su and Southeast regions.
- **Additional case of the VOC P.1 detected.** To date, the cases of P.1 are in the Anchorage/Mat-Su region.
- **Additional cases of the VOC B.1.429 detected.** To date, we have detected 61 cases in multiple locations across the state.
- **Additional cases of VOI P.2.** Within Alaska, only identified within the Southwest region.
- **CDC information on genomic variants can be found at:** [CDC Variant Link](#)

Table: Genomic Sequencing Effort in Alaska

	Samples
New Genomes released since last report	+133
Total Genomes released on GISAID	810

Table: Vaccine Breakthrough Investigation

Patients under investigation for Vaccine Breakthrough VB	177
Specimens submitted to SPHL for VB investigation	85 (48.0%)
Specimens fitting criteria for sequencing	74
Sequencing effort to assess VB	33
Successful virus lineage identifications	15 (45.5%)
Specimens in progress	41

Vaccine Breakthrough refers to patients 14 days out from being fully vaccinated who test positive for SARS-CoV-2. VBs may have a very low virus titer and are difficult to sequence.

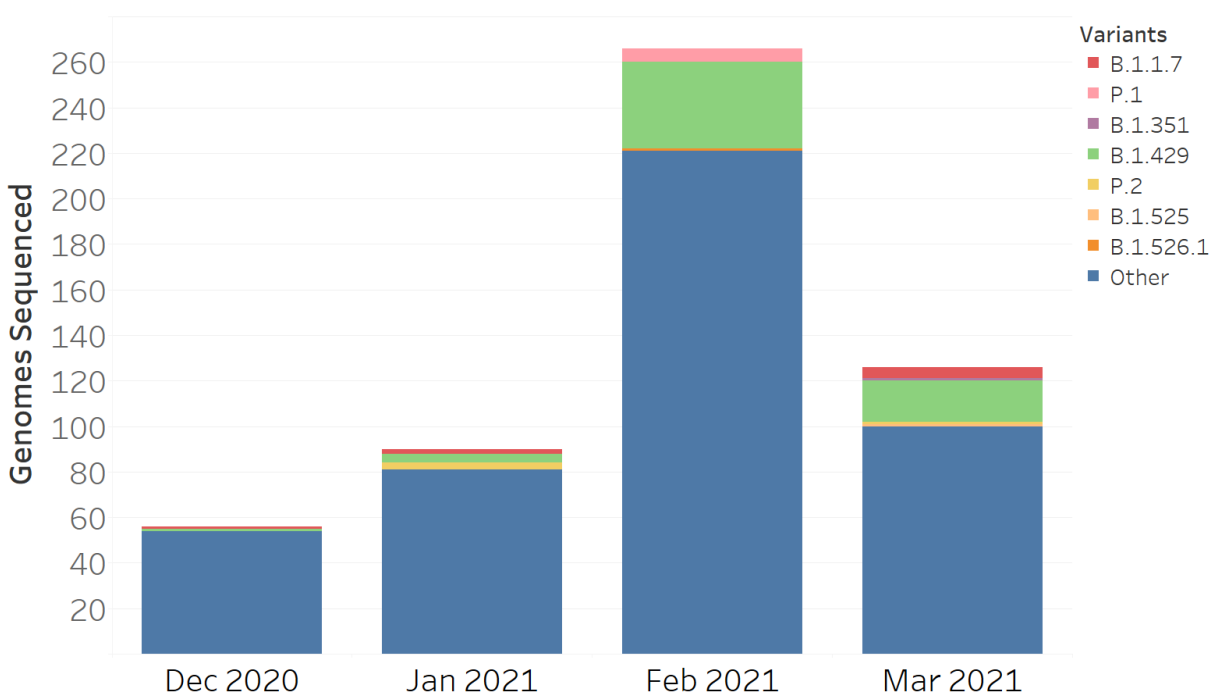
Variants of Concern

Lineage	Found	Change from Previous Report	First Identified in Alaska
B.1.1.7	7	+5	20 December 2020
P.1	6	+1	8 February 2021
B.1.351	1	+1	20 March 2021
B.1.427	0	--	Not detected
B.1.429	61	+18	24 December 2020

Variants of Interest

Lineage	Found	Change from Previous Report	First Identified in Alaska
B.1.526	1	+1	4 February 2021
B.1.525	1	+1	16 March 2021
P.2	4	+1	27 January 2021

Variants Identified in Alaska



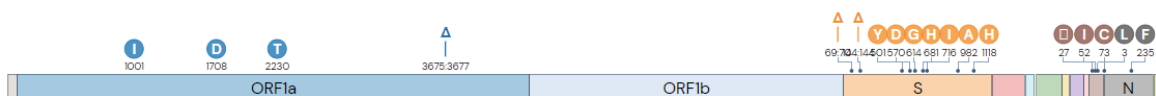
*Note that SARS-CoV-2 genome sequencing is not a random sample of all cases. The report does not estimate the prevalence of the population. As sequencing effort increases and the number of genome sequences increases, the estimate will better reflect the population.

Variants of Concern, Individual Lineage Reports

B.1.1.7

B.1.1.7 was first identified in the United Kingdom, also known as: Variant of Concern 202012/01, VOC-202012/01, 20B/501Y.V1, 20I/501Y.V1. This variant contains the N501Y mutation and a short deletion in the Spike (S) protein. This variant is concerning because it has shown to be significantly more transmissible (~50%) than the original SARS-CoV-2 lineages, and recent analyses from the United Kingdom suggest it leads to more severe disease outcomes. B.1.1.7 does not appear to evade vaccine-induced neutralizing antibody responses. B.1.1.7 is widely circulating in the US.

B.1.1.7 VOC in Alaska: B.1.1.7 was detected in December 2020 in the Anchorage/Mat-Su region. Additional cases have been detected in the Anchorage/Mat-Su and Southeast regions in March.

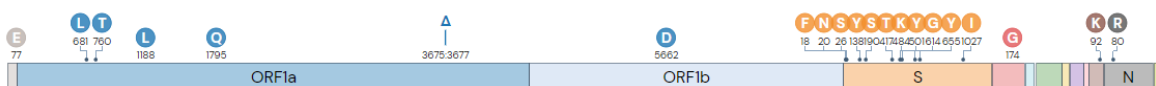


Location	B.1.1.7 found	First Identified
Worldwide	273213	20 September 2020
USA	11880	17 December 2020
Alaska	7	20 December 2020

P.1

P.1 was first identified in Brazil, also known as: Variant of Concern B.1.1.28.1, 20J/501Y.V3. This variant contains three key mutations in the S gene: E484K, N501Y, and K417T. Preliminary studies suggest the P.1, like B.1.351, may escape some vaccine-induced antibody responses although not the Pfizer and Moderna mRNA vaccines currently deployed in Alaska. Recent analyses suggest that P.1. may be more transmissible with higher risk of severe disease, to some degree.

P.1 in Alaska: P.1 was identified in early February 2021 in the Anchorage/Mat-Su region. One new cases with the P.1 variant have been detected since the previous report, but that case was from February.



Location	P.1 found	First Identified
Worldwide	1923	4 December 2020
USA	175	9 January 2021
Alaska	6	8 February 2021

B.1.351

The B.1.351 variant (also known as: 20H/501Y.V2) was first identified in South Africa and has begun circulating in other parts of the US. The B.1.351 has both N501Y and E484K mutations in the Spike protein. This variant is concerning because it has shown to be significantly more transmissible (~50%) than the original SARS-CoV-2 lineages. Preliminary studies suggest the B.1.351, like the P.1, may escape some vaccine-induced antibody responses, although not the Pfizer and Moderna mRNA vaccines currently deployed in Alaska.

B.1.351 variant in Alaska: The B.1.351 variant was identified in March 2021 in the Anchorage/Mat-Su region.

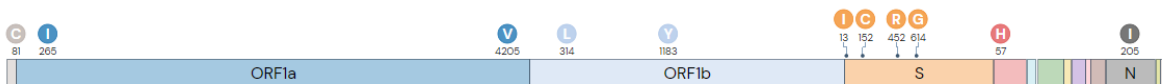


Location	B.1.351 found	First Identified
Worldwide	6905	8 October 2020
USA	242	1 January 2021
Alaska	1	20 March 2021

B.1.429

B.1.429 and a related lineage (B.1.427) were first identified in California and known as: CA VUI1. This variant has been upgraded to a variant of concern (VOC). This variant's prevalence grew in California from a summer 2020 initial observation and has spread to many other states. New research suggests an increased transmission (~20%) and potential escape from neutralizing antibodies. This variant is characterized by the L452R mutation in the S gene and is genetically similar to B.1.351 but lacks several key mutations. A related lineage, B.1.427, also was first identified in California.

B.1.429 variant in Alaska: The B.1.429 variant has been introduced into Alaska by December 2020 and found in many regions.



Location	B.1.429 found	First Identified
Worldwide	15330	30 June 2020
USA	15080	13 July 2020
Alaska	61	24 December 2020

Variants of Interest, Individual Lineage Reports

B.1.526

The B.1.526 variant first identified in New York and has begun circulating in other parts of the US. Little is known about this variant, but some genomes contain the E484K mutation in the Spike protein.

B.1.526 variant in Alaska: The B.1.526 variant was identified in February 2021, in the Anchorage-Mat Su region.

Location	B.1.526 found	First Identified
Worldwide	3525	7 September 2020
USA	3460	7 September 2020
Alaska	1	4 February 2021

B.1.525

The B.1.525 variant is circulating in New York and has begun circulating in other parts of the US. Little is known about this variant. The genomes contain the E484K, Q677H, and F888L mutations in the Spike protein.

B.1.525 variant in Alaska: The B.1.525 variant was identified in March 2021, in the Gulf Coast region.

Location	B.1.525 found	First Identified
Worldwide	1197	11 December 2020
USA	174	30 December 2020
Alaska	1	16 March 2021

P.2

P.2 was first identified in Brazil and is also known as: B.1.1.28.2. Little is known about this variant beyond that its prevalence grew in Brazil. This variant contains the E484K mutation in the Spike protein but lacks many key mutations in other variants of concern.

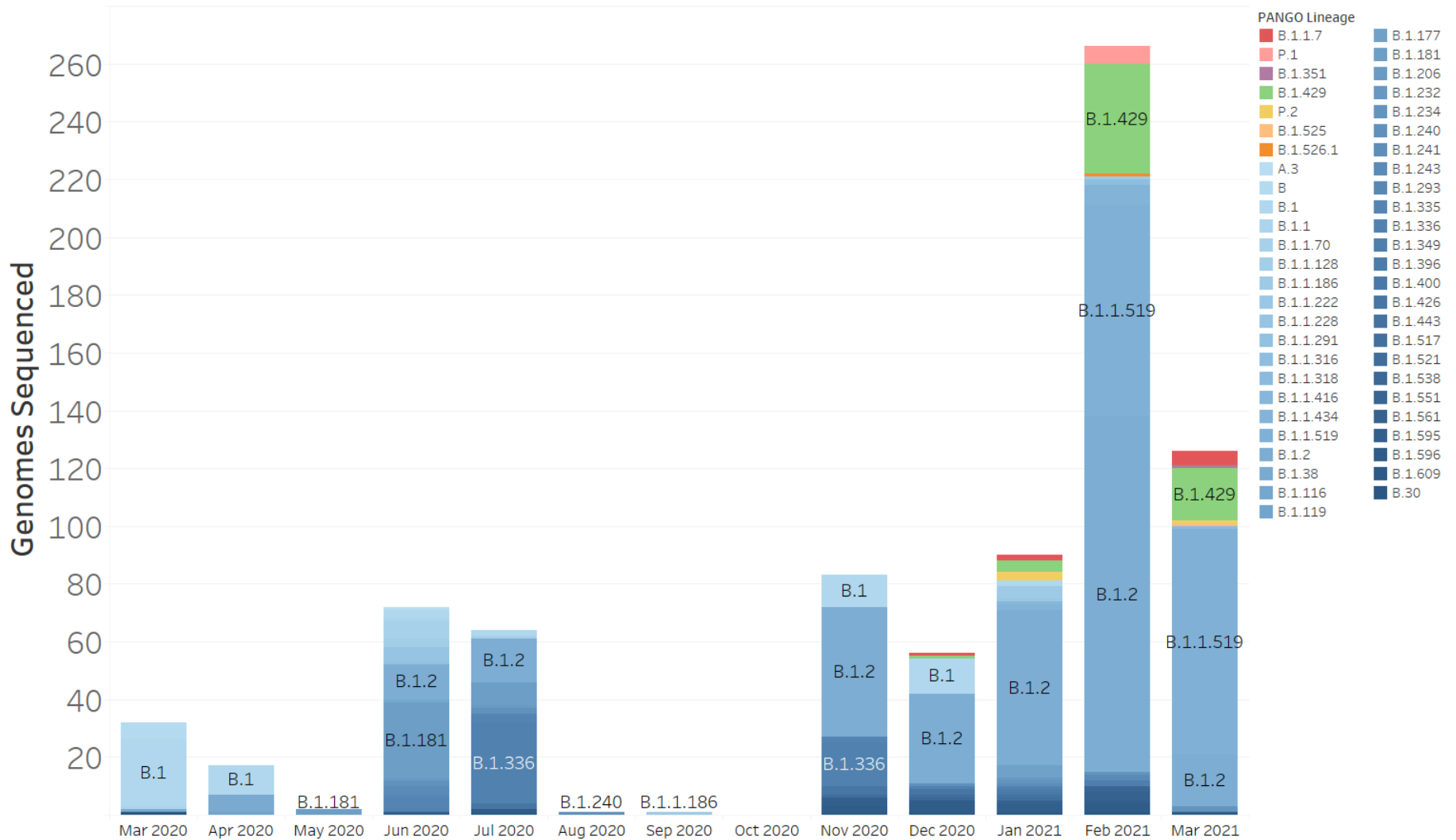
P.2 variant in Alaska: The P.2 variant was identified in January 2021, in the Southwest Alaska region.

Location	P.2 found	First Identified
Worldwide	1712	15 April 2020
USA	705	10 November 2020
Alaska	4	27 January 2021

Lineages in Alaska

Lineages Over Time

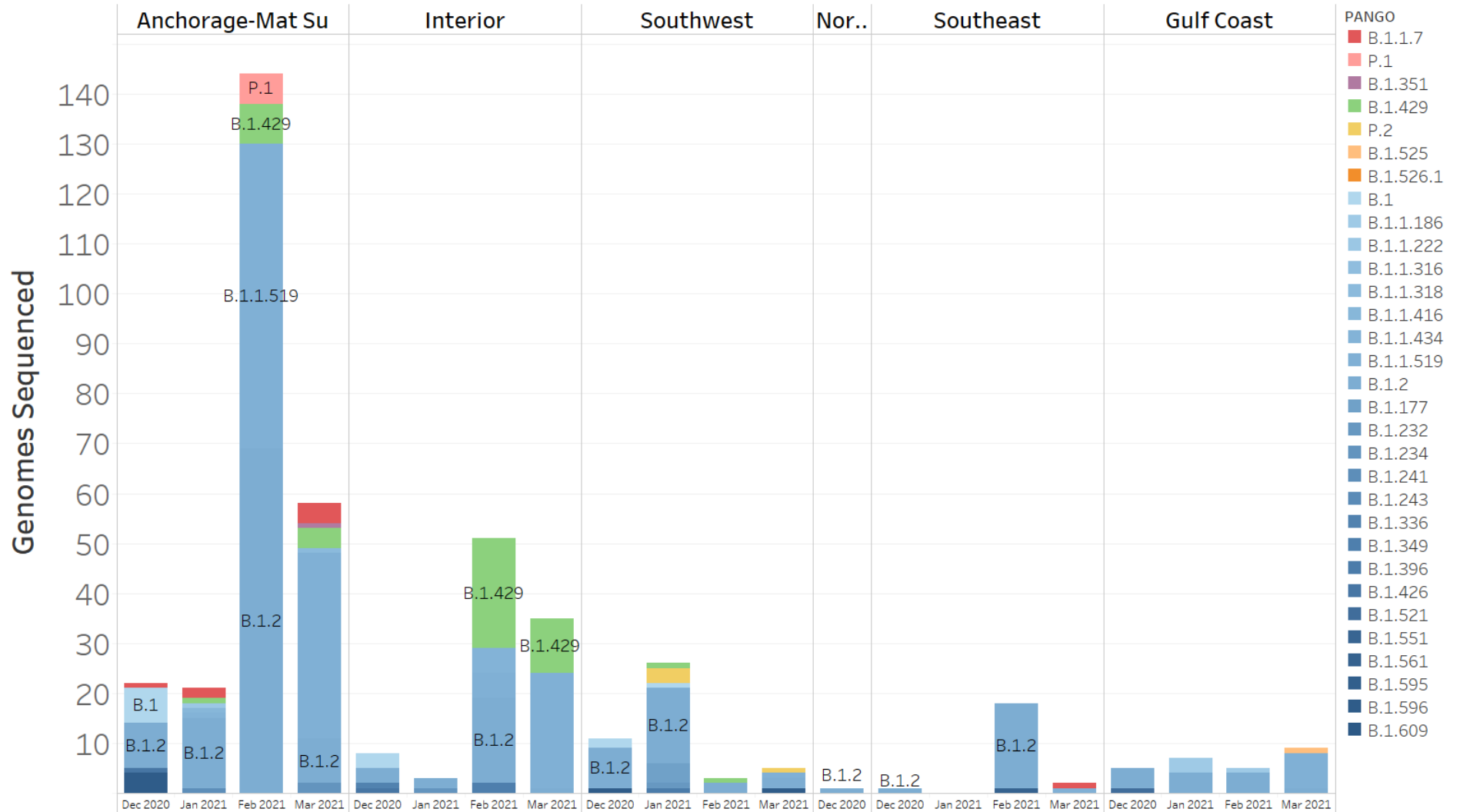
The graphs below indicate the number of genomes sequenced from Alaska cases per month (starting in March 2020). Bright colors highlight variants of concern and interest. PANGO lineages label the sections.



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Lineages by Alaska Location

The graphs below indicate the number of genomes sequenced from Alaska cases per month (starting in November 2020) within economic regions (map below). Colors and labels indicate PANGO lineages label the sections.



Note: Some genomes are not included because of missing geographic locations within Alaska.

Data Tables

Table: Lineages Over Time

PANGOLIN LINEAGE	MAR 2020	APR 2020	MAY 2020	JUN 2020	JUL 2020	AUG 2020	SEP 2020	OCT 2020	NOV 2020	DEC 2020	JAN 2021	FEB 2021	MAR 2021
B.1.1.7										1	2		5
P.1												6	
B.1.351													1
B.1.429										1	4	38	18
P.2											3		1
B.1.525													1
B.1.526.1												1	
A.3				1									
B	6												
B.1	23	10		3	2				11	12	2		
B.1.1	1			1									
B.1.1.70				6	1								
B.1.1.128				3									
B.1.1.186							1				4	1	
B.1.1.222											1		
B.1.1.228				5									
B.1.1.291				1									
B.1.1.316												2	
B.1.1.318													1
B.1.1.416											1		
B.1.1.434											2	7	
B.1.1.519												73	78
B.1.2				12	15				45	31	54	123	18
B.1.38	1	6											
B.1.116				1									
B.1.119		1											
B.1.177											4		
B.1.181			2	26	8								
B.1.206				1	1								
B.1.232											1		

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PANGOLIN LINEAGE	MAR 2020	APR 2020	MAY 2020	JUN 2020	JUL 2020	AUG 2020	SEP 2020	OCT 2020	NOV 2020	DEC 2020	JAN 2021	FEB 2021	MAR 2021
B.1.234											1	1	2
B.1.240				2	2	1				1			
B.1.241											1		
B.1.243				3								2	
B.1.293				1									
B.1.335				4	3				2				
B.1.336				1	28				15	1	1		
B.1.349												2	
B.1.396											1		
B.1.400											1		
B.1.426					2				3	2			
B.1.443											1		
B.1.517											1		
B.1.521									1	1			
B.1.538										1			
B.1.551												2	
B.1.561											1	3	
B.1.595				1					3		3	1	
B.1.596					2				3	5	1	3	1
B.1.609												1	
B.30	1												

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Table: Lineages by Alaska Location

PANGOLIN LINEAGE	ANCHORAGE-MAT SU				INTERIOR				SOUTHWEST				NOR.	SOUTHEAST				GULF COAST			
	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Dec 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Dec 2020	Jan 2021	Feb 2021	Mar 2021
B.1.1.7	1	2		4													1				
P.1			6																		
B.1.351				1																	
B.1.429		1	8	4			22	11		1	1										
P.2										3		1									
B.1.525																					1
B.1.526.1																					
B.1	7				3				2	1											
B.1.1.186																			3	1	
B.1.1.222		1																			
B.1.1.316																					
B.1.1.318				1																	
B.1.1.416		1																			
B.1.1.434		1					5														
B.1.1.519			61	37			5	23				1					1				7
B.1.2	9	14	69	9	3	2	17	1	8	15	2	2	1	1		17		4	4	4	1
B.1.177										4											
B.1.232										1											
B.1.234				2		1															
B.1.241		1																			
B.1.243																					
B.1.336					1																
B.1.349							2														
B.1.396										1											
B.1.426	1				1																
B.1.521																				1	
B.1.551																					
B.1.561																1					
B.1.595																					
B.1.596	4								1			1									
B.1.609																					

Additional Resources

CDC COVID-19 National Genomic Surveillance Dashboard - <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/variant-surveillance/genomic-surveillance-dashboard.html>

SARS-CoV-2 (hCoV-19) Mutation Situation Reports - <https://outbreak.info/situation-reports>

Nextstrain SARS-CoV-2 resources - <https://nextstrain.org/sars-cov-2/>

CoVariants - <https://covariants.org/>

PANGO Lineage Reports - https://cov-lineages.org/global_report.html

Locations within Alaska are grouped by Economic Region as seen below.

