

Table S1: Codon changes affecting amino acid in sars-cov-2 spike-protein gene their distributions

Sample	Reference ID	Amino Acid Change	Nucleotide Change	Codon Change	codon_count	codon_percent
K032298	NC_045512.2	IHV67I	21765:TACATG>	21764:ATACATGTC>ATC	ATACATGTC-5354;ATC-1072	ATACATGTC-83.32;ATC-16.68
K032298	NC_045512.2	GVYY141D	21987:GTGTTTATT>	21986:GGTGTTCATTAC>GAC	GGTGTTCATTAC-1;GAC-820	GGTGTTCATTAC-0.12;GAC-99.88
K032298	NC_045512.2	EFR155G	22029:AGTTCAG>	22028:GAGTTCAGAG>GGA	GAGTTCAGAG-856;GGA-2501	GAGTTCAGAG-25.50;GGA-74.50
K032298	NC_045512.2	NL210I	22194:ATT>	22193:AATTTA>ATA	AATTTA-2809;ATA-462	AATTTA-85.88;ATA-14.12
K032298	NC_045512.2	214EPE	22204:>GAGCCAGAA	22204:>GAGCCAGAA	-3059;GAGCCAGAA-351	-89.71;GAGCCAGAA-10.29
K032298	NC_045512.2	T19R	21618:C>G	21617:ACA>AGA	ACA-1955;AGA-5663	ACA-25.53;AGA-73.96
K032298	NC_045512.2	A67V	21762:C>T	21761:GCT>GTT	GCT-5644;GTT-1098	GCT-83.54;GTT-16.25
K032298	NC_045512.2	T95I	21846:C>T	21845:ACT>ATT	ACT-4284;ATT-1115	ACT-79.00;ATT-20.56
K032298	NC_045512.2	G142D	21987:G>A	21986:GGT>GAT	GGT-1;GAT-2586	GGT-0.04;GAT-99.85
K032298	NC_045512.2	S221L	22224:C>T	22223:TCG>TTG	TCG-2965;TTG-160	TCG-94.52;TTG-5.10
K032298	NC_045512.2	G339D	22578:G>A	22577:GGT>GAT	GGT-1860;GAT-566	GGT-76.04;GAT-23.14
K032298	NC_045512.2	S371L	22673:T>C	22673:TCC>CTC	TCC-1582;CTC-300	TCC-83.84;CTC-15.90
K032298	NC_045512.2	S371L	22674:C>T	22673:TCC>CTC	TCC-1582;CTC-300	TCC-83.70;CTC-15.87
K032298	NC_045512.2	S373P	22679:T>C	22679:TCA>CCA	TCA-1978;CCA-297	TCA-86.60;CCA-13.00
K032298	NC_045512.2	S375F	22686:C>T	22685:TCC>TTC	TCC-2188;TTC-319	TCC-86.93;TTC-12.67
K032298	NC_045512.2	L452R	22917:T>G	22916:CTG>CGG	CTG-4;CGG-2514	CTG-0.16;CGG-99.72
K032298	NC_045512.2	S477N	22992:G>A	22991:AGC>AAC	AGC-2696;AAC-215	AGC-92.33;AAC-7.36
K032298	NC_045512.2	T478K	22995:C>A	22994:ACA>AAA	ACA-3;AAA-2962	ACA-0.10;AAA-99.13
K032298	NC_045512.2	E484A	23013:A>C	23012:GAA>GCA	GAA-3172;GCA-400	GAA-88.43;GCA-11.15
K032298	NC_045512.2	Q493R	23040:A>G	23039:CAA>CGA	CAA-2943;CGA-544	CAA-84.18;CGA-15.56
K032298	NC_045512.2	G496S	23048:G>A	23048:GGT>AGT	GGT-2742;AGT-613	GGT-81.41;AGT-18.20
K032298	NC_045512.2	Q498R	23055:A>G	23054:CAA>CGA	CAA-2758;CGA-614	CAA-81.38;CGA-18.12
K032298	NC_045512.2	N501Y	23063:A>T	23063:AAT>TAT	AAT-3240;TAT-821	AAT-79.57;TAT-20.16
K032298	NC_045512.2	Y505H	23075:T>C	23075:TAC>CAC	TAC-3638;CAC-1136	TAC-75.71;CAC-23.64
K032298	NC_045512.2	T547K	23202:C>A	23201:ACA>AAA	ACA-5234;AAA-1427	ACA-78.28;AAA-21.34
K032298	NC_045512.2	D614G	23403:A>G	23402:GAT>GGT	GAT-1;GGT-8167	GAT-0.01;GGT-98.85
K032298	NC_045512.2	H655Y	23525:C>T	23525:CAT>TAT	CAT-4950;TAT-1418	CAT-77.42;TAT-22.18
K032298	NC_045512.2	N679K	23599:T>G	23597:AAT>AAG	AAT-1938;AAG-525	AAT-78.30;AAG-21.21
K032298	NC_045512.2	P681R	23604:C>G	23603:CCT>CGT	CCT-0;CGT-1714	CCT-0.00;CGT-82.05
K032298	NC_045512.2	P681H	23604:C>A	23603:CCT>CAT	CCT-0;CAT-364	CCT-0.00;CAT-17.42
K032298	NC_045512.2	S686R	23620:T>G	23618:AGT>AGG	AGT-1142;AGG-50	AGT-94.61;AGG-4.14
K032298	NC_045512.2	D796Y	23948:G>T	23948:GAT>TAT	GAT-1631;TAT-373	GAT-80.86;TAT-18.49
K032298	NC_045512.2	N856K	24130:C>A	24128:AAC>AAA	AAC-1852;AAA-423	AAC-80.94;AAA-18.49
K032298	NC_045512.2	D950N	24410:G>A	24410:GAT>AAT	GAT-1388;AAT-4935	GAT-21.91;AAT-77.90
K032298	NC_045512.2	Q954H	24424:A>T	24422:CAA>CAT	CAA-4601;CAT-1195	CAA-79.26;CAT-20.59
K032298	NC_045512.2	N969K	24469:T>A	24467:AAT>AAA	AAT-5367;AAA-1340	AAT-79.66;AAA-19.89
K032298	NC_045512.2	L981F	24503:C>T	24503:CTT>TTT	CTT-5597;TTT-1377	CTT-79.97;TTT-19.67

K032298 NC_045512.2 D1146D 25000:C>T 24998:GAC>GAT GAC-2095;GAT-498 GAC-80.27;GAT-19.08

Table S2: Nucleotide substitution in sars-cov-2 spike-protein gene their distributions

Sample	Reference ID	coor	Reference Nucleotide	read_count	Nucleotide Frequency	Nucleotide Percent
K032298	NC_045512.2	21551	A	4574	A:4405,T:162	A:96,T:4
K032298	NC_045512.2	21618	C	7683	G:5696,C:1974	G:74,C:26
K032298	NC_045512.2	21762	C	7032	C:5850,T:1106	C:83,T:16
K032298	NC_045512.2	21846	C	5721	C:4547,T:1172	C:79,T:20
K032298	NC_045512.2	21987	G	3437	A:2599	A:76
K032298	NC_045512.2	22224	C	3158	C:2997,T:160	C:95,T:5
K032298	NC_045512.2	22578	G	2461	G:1893,A:567	G:77,A:23
K032298	NC_045512.2	22673	T	2066	T:1760,C:301	T:85,C:15
K032298	NC_045512.2	22674	C	1964	T:305,C:1656	T:16,C:84
K032298	NC_045512.2	22679	T	2291	T:1990,C:297	T:87,C:13
K032298	NC_045512.2	22686	C	2528	C:2202,T:322	C:87,T:13
K032298	NC_045512.2	22917	T	2597	G:2591	G:100
K032298	NC_045512.2	22992	G	2998	G:2778,A:216	G:93,A:7
K032298	NC_045512.2	22995	C	3003	A:2995	A:100
K032298	NC_045512.2	23013	A	3598	A:3193,C:400	A:89,C:11
K032298	NC_045512.2	23040	A	3541	A:2982,G:552	A:84,G:16
K032298	NC_045512.2	23048	G	3664	G:3041,A:618	G:83,A:17
K032298	NC_045512.2	23055	A	3403	A:2773,G:624	A:81,G:18
K032298	NC_045512.2	23063	A	4087	A:3259,T:825	A:80,T:20
K032298	NC_045512.2	23075	T	4849	T:3708,C:1140	T:76,C:24
K032298	NC_045512.2	23202	C	6726	A:1432,C:5285	A:21,C:79
K032298	NC_045512.2	23403	A	8456	G:8431	G:100
K032298	NC_045512.2	23525	C	6682	C:5199,T:1480	C:78,T:22
K032298	NC_045512.2	23599	T	2487	T:1954,G:526	T:79,G:21
K032298	NC_045512.2	23604	C	2230	G:1817,A:410	G:81,A:18
K032298	NC_045512.2	23620	T	1236	T:1179,G:51	T:95,G:4
K032298	NC_045512.2	23948	G	2084	G:1705,T:375	G:82,T:18
K032298	NC_045512.2	24130	C	2302	C:1871,A:426	C:81,A:19
K032298	NC_045512.2	24410	G	6356	A:4959,G:1396	A:78,G:22
K032298	NC_045512.2	24424	A	5825	A:4619,T:1201	A:79,T:21
K032298	NC_045512.2	24469	T	6783	T:5418,A:1355	T:80,A:20
K032298	NC_045512.2	24503	C	7054	C:5662,T:1381	C:80,T:20
K032298	NC_045512.2	25000	C	2619	C:2114,T:498	C:81,T:19

Table S3: Selected nucleotide InDels in sars-cov-2 spike-protein gene their distributions

Sample	Reference ID	coor	Nucleotide Frequency	Nucleotide Percent
K032298	NC_045512.2	21765	delTACATG:1073,read_count:7010	15.31
K032298	NC_045512.2	21987	delGTGTTTATT:827,read_count:3442	24.03
K032298	NC_045512.2	22029	delAGTTCA:2510,read_count:3540	70.9
K032298	NC_045512.2	22194	delATT:462,read_count:3743	12.34
K032298	NC_045512.2	22204	insGAGCCAGAA:351,read_count:3059	11.47