Novel mutations in XBB variants of SARS-CoV-2 decipher high rates of morbidity among COVID-19 patients in South India

Supplemental Table 1: Regional distribution of SARS-CoV-2 Omicron XBB sub-lineages (n=244).

S. No	District	Omicron XBB sub-variants					Total
		XBB	XBB.1	XBB.2	XBB.3	XBB.5	
1	Chennai	10	29	7	77	0	123
2	Coimbatore	0	6	3	9	0	18
3	Kanchipuram	0	3	1	8	1	13
4	Tiruvannamalai	0	2	0	10	0	12
5	Erode	0	1	1	10	0	12
6	Thiruvallur	1	1	0	6	0	8
7	Chengalpattu	0	2	3	2	0	7
8	Tiruchirappalli	1	2	0	2	1	6
9	Madurai	3	1	0	1	0	5
10	Salem	0	3	1	0	1	5
11	Villupuram	1	1	0	2	0	4
12	Perambalur	1	0	0	1	2	4
13	Ranipet	1	0	0	3	0	4
14	Ramanathapuram	2	0	0	1	0	3
15	Tirunelveli	1	0	0	2	0	3
16	Kanyakumari	1	1	1	0	0	3
17	Tiruppur	0	0	1	1	0	2
18	Dindigul	1	0	0	1	0	2
19	Vellore	1	1	0	0	0	2
20	Pudukottai	0	0	1	0	0	1
21	Virudhunagar	0	0	0	1	0	1
22	Thanjavur	0	0	0	1	0	1
23	The Nilgiris	0	0	1	0	0	1
24	Thoothukudi	0	1	0	0	0	1
25	Theni	0	1	0	0	0	1
26	Ariyalur	0	0	0	1	0	1
27	Thiruvarur	0	1	0	0	0	1
	Grand total	**24**	**56**	**20**	**139**	**5**	**244**

Supplemental Table 2A: Age-wise distribution of SARS-CoV-2 Omicron XBB sub-lineages (n=244)

Age group (in years)	Omicron XBB sub-variants						Percentage
	XBB	XBB.1	XBB.2	XBB.3	XBB.5	Total	
0-12	0	2	0	3	0	5	**2.04**
13-18	0	2	0	4	0	6	**2.45**
19-30	06	11	4	35	2	58	**23.77**
31-50	7	20	5	44	2	77	**31.55**
51-65	5	10	4	22	0	41	**16.8**
>65	6	12	7	31	1	57	**23.36**
Total	**24**	**56**	**20**	**139**	**5**	**244**	**100**
Percentage	**9.8**	**23**	**8.2**	**57**	**2**	**100**	

Supplemental Table 2B: Gender-wise distribution of SARS-CoV-2 Omicron XBB sub-lineages (n=244)

Age group	Omicron XBB sub-variants						Percentage
	XBB	XBB.1	XBB.2	XBB.3	XBB.5	Total	
Male	13	31	12	69	3	128	52
Female	11	25	8	70	2	116	48
Total	24	56	20	139	5	244	100
Percentage	**9.8**	**23**	**8.2**	**57**	**2**	**100**	

Supplemental Table 3: Type of vaccines administered in the study group (n=244)

Vaccine ID	Proprietary name	Manufacturer	Type of vaccine	Mode of Administration	Characteristics	No. of cases	Percentage
AZD1222	Covishield™	Serum Institute of India Pvt Ltd and COVID-19 vaccine AstraZeneca (AstraZeneca)	Recombinant	Intramuscular injection	Recombinant, replication-deficient chimpanzee adenovirus vector encoding the SARS-CoV-2 spike (S) glycoprotein	141	58
BBV152	Covaxin®	Bharath Biotech	Inactivated viron	Intramuscular injection	β-propiolactone inactivated vaccine	43	18
BNT162B2	Pfizer-BioNTech	Pfizer and BioNTech	Messenger RNA (mRNA) vaccine	Intramuscular injection	Messenger RNA (mRNA) vaccine uses a genetic code called RNA to make your body's cells produce the coronavirus' specific spike protein	10	4
mRNA1273	Spikevax	American company Moderna, the United States National Institute of Allergy and Infectious Diseases (NIAID), and the Biomedical Advanced Research and Development Authority (BARDA)	Nucleoside-modified mRNA (modRNA)	Intramuscular injection	Lipid nanoparticle–encapsulated mRNA-based vaccine	4	2
Not vaccinated						44	18
Unknown						2	1
Total						**244**	

Supplemental Table 4A: Underlying conditions among individuals infected with SARS-CoV-2 Omicron XBB sub-lineages (n=244)

S. No	Underlying condition	Omicron XBB sub-variants					Total	Percentage
		XBB	XBB.1	XBB.2	XBB.3	XBB.5		
1	Diabetes mellitus	5	8	4	21	0	38	15.6
2	Hypertension	4	5	3	17	1	30	12.3
3	Cardiovascular disease	1	1	0	8	2	12	4.9
4	Thyroid dysfunction	0	1	0	2	0	3	1.2
5	Hyponatraemia	0	0	0	2	0	2	0.8
6	Parkinson's disease	0	0	0	2	0	2	0.8
7	Asthma	0	0	0	2	0	2	0.8
8	Arthritis	0	1	0	0	0	1	0.4
9	Sinusitis	0	0	0	1	0	1	0.4
10	Seizures	0	0	0	0	1	1	0.4
11	Polycythemia	1	0	0	0	0	1	0.4
12	Chronic liver disease	0	0	0	0	1	1	0.4
13	Lower respiratory infection	0	0	0	1	0	1	0.4
14	Pneumonia	0	0	1	0	0	1	0.4
15	Upper respiratory infection	0	0	0	1	0	1	0.4
16	No underlying condition	15	43	15	101	3	177	73
17	Unknown	0	2	0	0	0	2	0.8

Supplemental Table 4B: Underlying conditions among individuals infected with SARS-CoV-2 Omicron XBB sub-lineages (n=244)

S. No	Underlying condition	Omicron XXB sub-variants					Total	Percentage
		XBB	XBB.1	XBB.2	XBB.3	XBB.5		
1	Diabetes mellitus (DM)	3	3	1	10	0	17	7
2	DM+hypertension (HTN)	1	4	3	7	0	15	6.1
3	HTN	3	1	0	5	0	9	3.7
4	Cardiovascular disease (CVD)	0	0	0	4	0	4	1.6
5	DM+CVD	1	1	0	0	0	2	0.8
6	DM+HTN+CVD	0	0	0	2	0	2	0.8
7	HTN+CVD	0	0	0	2	0	2	0.8
8	Thyroid dysfunction (TD)	0	1	0	1	0	2	0.8
9	Arthritis	0	1	0	0	0	1	0.4
10	Asthma+sinusitis	0	0	0	1	0	1	0.4
11	CVD+seizures	0	0	0	0	1	1	0.4
12	DM+hyponatremia	0	0	0	1	0	1	0.4
13	DM+TD+asthma	0	0	0	1	0	1	0.4
14	Polycythemia	1	0	0	0	0	1	0.4
15	HTN+CVD+ chronic liver disease (CLD)	0	0	0	0	1	1	0.4
16	HTN+Lower respiratory infection (LRI)	0	0	0	1	0	1	0.4
17	Parkinsons disease (PD)	0	0	0	1	0	1	0.4
18	PD+hyponatraemia	0	0	0	1	0	1	0.4
19	Pneumonia	0	0	1	0	0	1	0.4
20	Upper respiratory infection (URI)	0	0	0	1	0	1	0.4
21	No underlying condition	15	43	15	101	3	177	72.5
22	Unknown	0	2	0	0	0	2	0.8
	Grand total	**24**	**56**	**20**	**139**	**5**	**244**	**100**

Supplemental Table 5A: Severity of illness in SARS-CoV-2 Omicron sub-variant infected individuals (n=244)

Clinical illness	Omicron XBB sub-variants reported						Percentage
	XBB	XBB.1	XBB.2	XBB.3	XBB.5	Total	
Asymptomatic	5	14	4	31	1	55	22.6
Mild	15	31	12	91	2	151	61.9
Moderate	1	7	3	13	0	24	9.8
Severe	3	4	1	4	2	14	5.7
Total	24	56	20	139	5	244	100

Supplemental Table 5B: Clinical course of illness in SARS-CoV-2 Omicron sub-variant infected individuals (n=244)

Clinical illness	Omicron XBB sub-variants reported						Percentage
	XBB	XBB.1	XBB.2	XBB.3	XBB.5	Total	
Hospitalization	**7**	**12**	**6**	**40**	**4**	**69**	**28%**
Without O_2 support	6	11	5	39	4	65	94%
With O_2 support	1	1	1	1	0	4	6%

Supplemental Table 5C: Clinical course of illness in SARS-CoV-2 Omicron sub-variant infected individuals (n=244)

Clinical illness	Omicron XBB sub-variants reported						Percentage
	XBB	XBB.1	XBB.2	XBB.3	XBB.5	Total	
Hospitalization	**7**	**12**	**6**	**40**	**4**	**69**	28%
Without ICU/HDU support	6	11	6	38	2	63	91%
With ICU/HDU support	1	1	0	2	2	6	9%

Supplemental Table 5D: Clinical course of illness in SARS-CoV-2 Omicron sub-variants infected individuals (n=244)

Clinical illness	Omicron XBB sub-variants reported					
	XBB	**XBB.1**	**XBB.2**	**XBB.3**	**XBB.5**	**Total**
Hospitalization	0	0	0	1 (Mild)	0	1
With O_2 support	1 (severe)	0	0	0	0	1
Under ICU/HDU care	0	1 (asymptomatic)	0	0	0	1
No hospitalization	0	0	1 (asymptomatic)	2 (1 asymptomatic & 1 moderate)	0	3
Total	1	1	1	3	2	6

Supplemental Table 6: Characteristics of mutation detected from SARS-CoV-2 sub-lineages of XBB (including two unique mutations (n=98) highlighted in yellow and green).

Sample ID	GeneBank Accession ID	Sub-lineages reported	Mutations detected
18	OQ587517	**XBB.3**	M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
19	OQ569687	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:F86I, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:D614G, S:H655Y, S:N679KF, S:P681H, S:N764K, S:D796Y, S:Q954H
24	OQ569688	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:D215Y, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
27	OQ587518	**XBB.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:T245I, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:A599V, ORF1a:T708I, ORF1a:T842I, ORF1a:G1307S, ORF1a:I2010V, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:D3668Y, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:N81R, S:L84F, S:Y91C, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N,S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:A653V,S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
28	OQ569689	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R,N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:A2129S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF7a:A105V, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
29	OQ587519	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
40	OQ569690	**XBB.3**	E:T11A, M:Q19E, M:A63T, M:H155Y, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S,

			S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
41	OQ587520	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R,,ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
42	OQ587521	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:V83A, S:F86L, S:G142D
43	OQ587522	**XBB.3**	E:T11A,M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:H2357Y, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
44	OQ652066	**XBB.3**	E:T11A, M:Q19E, N:P13L, N:A152V, N:S187L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
52	OQ569691	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R36Q, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, ORF9b:D33N, S:T19I, S:**A27S**, S:G142D, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
59	OQ587523	**XBB**	E:T11A, M:Q19E, M:A63T, N:P13L, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
60	OQ569692	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S,S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
61	OQ587524	**XBB.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:V1104A, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
76	OQ569693	**XBB.3**	E:T11A,M:Q19E,M:A63T,N:P13L,N:R203K,N:G204R,N:S413R,ORF1a:K47R,ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:L3606F, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, , ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H

77	OQ569694	**XBB.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:A653V, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
82	OQ587525	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
94	OQ587526	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S,ORF1a:H2357Y,ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F,ORF1a:T3255I,ORF1a:P3395H,ORF1b:P314L, ORF1b:G662S,ORF1b:S959P,ORF1b:R1315C,ORF1b:I1566V,ORF1b:I1998V,ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
95	OQ587527	**XBB.3**	E:T11A, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R,ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:T1881I, ORF1a:G2868S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
111	OQ587528	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:R73H, ORF1a:G82D, ORF1a:S135R, ORF1a:G728A, ORF1a:G2284Q, ORF1a:P2287H, ORF1b:P314L, ORF9b:P10S, S:T19I, S:**A27S**, S:F92N, S:G142D
124	OQ587529	**XBB**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:H374Y, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
133	OQ569695	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:A152V, N:S187L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
143	OQ587530	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:P1727H, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
144	OQ587531	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R36Q, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, ORF9b:D33N, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H

160	OQ587532	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:T4174I, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:V1760F, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:F92I, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
161	OQ587533	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:P276T, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
162	OQ569696	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:T981S, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:T323I, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
163	OQ587534	**XBB**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
174	OQ569697	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:K2063N, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
177	OQ587535	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:V2866M, ORF1a:L3027F, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:D210E, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K
178	OQ587536	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:M85I, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I
179	OQ569698	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:M85I, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I
180	OQ587537	**XBB.1**	E:T11A, M:Q19E, N:P13L, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:G1819S, ORF1a:S1857P, ORF1a:A2123V, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF7a:L30H, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:S94A, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:P507T, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H

181	OQ587538	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G575R, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V,ORF1b:T2163I,ORF3a:T223I,ORF6:D61L,ORF9b:P10S,S:T19I
182	OQ587539	**XBB**	E:T11A, M:Q19E, M:A63T, N:P13L, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF3a:T223I, ORF6:D61L, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:F92L, S:A93S, S:S94T, S:G142D, S:H146Q, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
183	OQ652056	**XBB**	E:T11A, N:P13L, N:M101*, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF9b:P10S, ORF9b:K97N, ORF9b:*98R, S:T19I, S:**A27S**, S:R408S, S:K417N, S:N440K, S:V445P
184	OQ569699	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:G1819S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
185	OQ569700	**XBB.1.9**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:G1819S, ORF1a:Y2141H, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y,,S:Q954H
186	OQ569701	**XBB.1.9**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:G1819S, ORF1a:Y2141H, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
187	OQ569702	**XBB.1.9**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:G238S, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:G1819S, ORF1a:Y2141H, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
188	OQ587540	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:K198N, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, ORF9b:E65D, S:T19I
189	OQ569703	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:G1819S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H

190	OQ587541	**XBB.2**	E:T11A, M:Q19E, M:A63T, M:I73V, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:T1637I, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:S54P, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:D253G, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
191	OQ569704	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R36Q, N:R203K.N:G204R, N:S413R, ORF1a:K47R, ORF1a:H81R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:K1720R, ORF1a:T1881I, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, ORF9b:D33N, S:T19I, S:**A27S**, S:D88K, S:G89W, S:V90G, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:A647S, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H, S:N969K
192	OQ652057	**XBB.1**	E:T11A, M:Q19E, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, ORF9b:T60I, S:T19I, S:F43R
193	OQ569705	**XBB.2**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:I3779V, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:A67S, S:G142D, S:H146Q, S:Q183E, S:V213E, S:D253G, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:P521Q, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
194	OQ569706	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:A540V, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H, S:N969K
195	OQ587542	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:A252S, N:P368L, N:S413R, ORF1a:K47R, ORF1a:R99H, ORF1a:S135R, ORF1a:F651L, ORF1a:T842I, ORF1a:L1110F, ORF1a:G1307S, ORF1a:A2379V, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T24I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
196	OQ652149	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:F86I, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H

197	OQ587543	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:G2545S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
198	OQ569707	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
199	OQ587544	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:D144Y, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
200	OQ587545	**XBB.2**	E:T11A, M:Q19E, M:A63T, N:P13L, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:A2909S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T24I, ORF3a:D155Y, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
201	OQ587546	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:A90S, N:R203K, N:G204R, N:S413R, ORF1a:R24H, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:S2911T, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:T4355I, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, ORF9b:E86D, S:T19I
202	OQ587547	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:G1819S, ORF1a:L3027F, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:T4175I, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
203	OQ587548	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S
204	OQ569708	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:S1952L, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:F86L, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
205	OQ587549	**XBB.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:R550C, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
206	OQ587550	**XBB.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C,

			ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K
207	OQ587551	**XBB.3**	E:T11A, M:Q19, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**
208	OQ587552	**XBB.1.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
209	OQ587553	**XBB.1.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I
210	OQ652067	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:G353C, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:E3073K, ORF1a:C3093V, ORF1a:T3095N, ORF1a:L3829F, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:D1746Y, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, ORF9b:N55S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:T478K, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
211	OQ569709	**XBB.1.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:F347C, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:T478K, S:E484A, S:F486P, S:F490S, S:Q498, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
212	OQ587554	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3371S, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:A869V, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I
213	OQ587555	**XBB.1.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:N87D, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486P, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H, S:N969K
214	OQ587556	**XBB**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S
215	OQ587557	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146K, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S

216	OQ652150	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:L1130F, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
217	OQ587558	**XBB.3**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:D1440G, ORF1a:K1529N, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:T250I, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:I1998V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I
218	OQ652151	**XBB.2**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:I3779V, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:**A27S**, S:A67S, S:G142D, S:H146Q, S:Q183E, S:V213E, S:D253G, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K,S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:P521Q, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
219	OQ652069	**XBB.1.5**	E:T11A, M:Q19E, N:P13L, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1b:P314L, ORF3a:L73P, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:G339H, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S
220	OQ652070	**XBB.2**	N:R203K, N:G204R, ORF1a:K47R, ORF1a:S135R, ORF1a:D203N, ORF1a:Y799I, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3201F, ORF1a:T3255, ORF1a:P3395H, ORF1b:P314L, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, ORF9b:E65G, S:T19I, S:G142D, S:H146Q, S:Q183E, S:V213E, S:D253G
221	OQ569710	**XBB.2**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF1b:A2222V, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146P, S:Q183E, S:V213E, S:D253G, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:Q613H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
222	OQ587559	**XBB.1.2**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G950S, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:T1050N, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I
223	OQ587560	**XBB.2**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:P1977L, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:A67S, S:G142D, S:H146Q, S:Q183E, S:V213E, S:D253G, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417, S:N440, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:P521Q, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
224	OQ652152	**XBB.1.2**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:T1678N, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:Y1648C, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, ORF9b:A22V, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
225	OQ569711	**XBB.1.2**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:T1678N, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:Y1648C, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, ORF9b:A22V, S:T19I, S:**A27S**, S:G142D,

			S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K,S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
226	OQ587561	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:G1705S, ORF1a:T2087I, ORF1a:L3027F, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:A4357V, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I
227	OQ587562	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:K1828Q, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, SN764K, S:D796Y, S:Q954H
228	OQ587563	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:P2287S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF7a:A8V, ORF9b:P10S, S:T19I
229	OQ587564	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:P80L, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**
230	OQ587565	**XBB**	E:T11A, M:Q19E, N:P13L, N:G129S, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:G82D, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:V1915I, ORF1a:L2367I, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:E1264D, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, S:T19I, S:**A27S**, S:S31F, S:V62L, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486P, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
231	OQ587566	**XBB.1.9.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:C657Y, ORF1a:T842I, ORF1a:G1307S, ORF1a:G1819S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:T4175I, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I
232	OQ569712	**XBB.2**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:G2091S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF7a:A13V, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:D253G, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486P, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:P521S, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
233	OQ587567	**XBB.2**	E:T11A, M:Q19E, M:A63T, N:P13L, N:A50V, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, ORF9b:R47C, S:T19I, S:**A27S**
234	OQ587568	**XBB.1.9**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:E36D, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:N1262D, ORF1a:G1307S, ORF1a:G1819S, ORF1a:P2134S, ORF1a:L3027F, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:T4175I, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1322V, ORF1b:S1408A, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
235	OQ569713	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3371S, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C,

			ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
236	OQ652153	**XBB.1.2**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:T1678N, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:Y1648C, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, ORF9b:A22V, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, SR408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
237	OQ569714	**XBB.1.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:T2300I, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P218L, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486P, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H
238	OQ587569	**XBB.1.5**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:T2300I, ORF1a:L3027F, ORF1a:T3090, ORF1a:L3201F, ORF1a:T3255, ORF1a:P3395H, ORF1b:P218L, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**
239	OQ569715	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:W45R, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S,S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:T747I, S:N764K, S:D796Y, S:Q954H
240	OQ587570	**XBB.1**	E:T11A, M:Q19E, N:P13L, N:S78N, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:L92F, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:P2287S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF9b:P10S, ORF9b:A75T, S:T19I
241	OQ587571	**XBB.1.9**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:T362IN:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:P971L, ORF1a:G1307S, ORF1a:G1819S, ORF1a:L3027F, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1a:T4175I, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:Q1546H, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:K77T, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K
242	OQ587572	**XBB.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:S413R, ORF1a:K47R, ORF1a:P80L, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I, S:**A27S**, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:R346T, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486S, S:F490S, S:Q498R, S:N501Y, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H

243	OQ587573	**XBB.1.5**	E:T11A, N:P13L, N:R203K, N:G204RN:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:G1307S, ORF1a:I2790T, ORF1a:L3027F, ORF1a:T3090I, ORF1a:L3201F, ORF1a:T3255I, ORF1a:P3395H, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:I1566V, ORF1b:T2163I, ORF3a:I118T, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:P10S, S:T19I
244	OQ587574	**XBB.1.9.1**	E:T11A, M:Q19E, M:A63T, N:P13L, N:R203K, N:G204R, N:T362IN:S413R, ORF1a:K47R, ORF1a:S135R, ORF1a:T842I, ORF1a:P971L, ORF1a:G1307S, ORF1a:G1819S, ORF1b:P314L, ORF1b:G662S, ORF1b:S959P, ORF1b:R1315C, ORF1b:Q1546H, ORF1b:I1566V, ORF1b:T2163I, ORF3a:T223I, ORF6:D61L, ORF8:G8*, ORF9b:I5T, ORF9b:P10S, S:T19I, S:**A27S**, S:Y91H, S:G142D, S:H146Q, S:Q183E, S:V213E, S:G252V, S:G339H, S:L368I, S:S371F, S:S373P, S:S375F, S:T376A, S:D405N, S:R408S, S:K417N, S:N440K, S:V445P, S:G446S, S:N460K, S:S477N, S:T478K, S:E484A, S:F486P, S:F490S, S:Q498R, S:N501Y, S:Y505H, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y, S:Q954H

Supplementary Table 7: Univariate binary regression analysis

A) Asymptomatic		
Characteristics	**Odds ratio (95% CI)**	**p value**
Age (5)	0.986 (0.910 – 1.067)	0.720
Gender, male	1.58 (0.816 – 3.044)	0.176
Ct value	0.102 (0.939 – 1.152)	0.453
History of COVID-19	0.586 (0.231 – 1.489)	0.261
Vaccination (Yes)	1.280 (0.531 – 3.088)	0.582
AZD1222	1.143 (0.457 – 2.858)	0.775
BBV152	1.475 (0.496 – 4.384)	0.485
BNT162b/mRNA-1273	2.388 (0.495 – 11.52)	0.278
No. of doses	1.041 (0.753 – 1.441)	0.806
Vaccination prior to COVID-19	1.534 (0.606 – 3.886)	0.367
Underlying conditions (Yes)	0.728 (0.373 – 1.420)	0.352
Metabolic syndrome	1.390 (0.547 – 3.536)	0.489
Pregnancy	0.429 (0.163 – 1.124)	0.085
No. of underlying conditions	1.135 (0.750 – 1.720)	0.549
XBB.1	2.348 (0.141 – 39.171)	0.552
XBB.2	0.783 (0.046 – 13.391)	0.866
XBB.3	1.971 (0.196 – 19.776)	0.564
XBB.5	7.645 (0 – 22.345)	0.999
B) Mild		
Characteristics		
Age (5)	0.964 (0.906 – 1.025)	0.244
Gender, male	0.815 (0.490 – 1.356)	0.431
Ct value	0.971 (0.896 – 1.053)	0.477
History of COVID-19	0.566 (0.29 – 1.104)	0.095
Vaccination (Yes)	3.211 (1.640 – 6.286)	0.001***
AZD1222	3.021 (1.507 – 6.055)	0.002**
BBV152	4.327 (1.777 – 10.534)	0.001***
BNT162b/mRNA-1273	1.875 (0.472 – 7.454)	0.372

No. of doses	1.512 (1.165 – 1.962)	0.002**
Vaccination prior to COVID-19	3.062 (1.559 – 6.011)	0.001***
Underlying conditions (Yes)	0.807 (0.472 – 1.380)	0.433
Metabolic syndrome	0.813 (0.411 – 1.609)	0.553
Pregnancy	0.764 (0.308 – 1.895)	0.561
No. of underlying conditions	1.024 (0.731 – 1.435)	0.889
XBB.1	0.333 (0.124 – 0.898)	0.030*
XBB.2	0.733 (0.219 – 2.454)	0.615
XBB.3	1.253 (0.510 – 3.081)	0.623
XBB.5	0.150 (0.014 – 1.560)	0.112
C) Moderate/Severe		
Characteristics		
Age (5)	1.121 (1.029 – 1.220)	0.009**
Gender, male	0.779 (0.387 – 1.468)	0.484
Ct value	1.047 (0.939 – 1.166)	0.409
History of COVID-19	3.634 (1.691 – 7.807)	0.001***
Vaccination (Yes)	4.889 (1.133 – 21.101)	0.033*
AZD1222	5.946 (1.363 – 25.946)	0.018*
BBV152	2.316 (0.402 – 13.353)	0.348
BNT162b/mRNA-1273	5.500 (0.674 – 44.903)	0.112
No. of doses	1.541 (1.041 – 2.281)	0.031*
Vaccination prior to COVID-19	0.725 (0.156 – 3.358)	0.681
Underlying conditions (Yes)	0.996 (0.804 – 1.234)	0.973
Metabolic syndrome	1.931 (0.855 – 4.360)	0.113
Pregnancy	4.223 (0.551 – 32.377)	0.166
No. of underlying conditions	1.380 (0.910 –2.092)	0.130
XBB.1	1.087 (0.304 – 3.881)	0.898
XBB.2	1.250 (0.270 – 5.795)	0.776
XBB.3	0.750 (0.230 – 2.446)	0.633
XBB.5	3.333 (0.414 – 26.857)	0.258
D) Hospitalization		
Characteristics		

Age (5)	0.923 (0.862 – 0.989)	0.024*
Gender, male	0.628 (0.355 – 1.112)	0.111
Ct value	1.109 (1.008 – 1.221)	0.035*
History of COVID-19	0.950 (0.468 – 1.932)	0.888
Vaccination (Yes)	1.567 (1.035 – 2.373)	0.034*
AZD1222	1.333 (0.557 – 3.193)	0.519
BBV152	2.200 (0.756 – 6.402)	0.519
BNT162b/mRNA-1273	2.667 (0.466 – 15.252)	0.270
No. of doses	1.201 (0.873 – 1.653)	0.260
Vaccination prior to COVID-19	1.695 (0.712 – 4.032)	0.233
Underlying conditions (Yes)	1.668 (0.768 – 1.930)	0.005**
Metabolic syndrome	2.449 (1.230 – 4.876)	0.011*
Pregnancy	3.032 (1.241 – 7.408)	0.015*
No. of underlying conditions	0.436 (0.299 – 0.636)	<0.0001****
XBB.1	1.021 (0.334 – 3.117)	0.971
XBB.2	0.875 (0.233 – 3.284)	0.843
XBB.3	1.072 (0.410 – 2.803)	0.877
XBB.5	0 (0 – 0)	0.999
E) O2 support		
Characteristics		
Age (5)	0.750 (0.555 – 1.013)	0.061
Gender, male	0.888 (0.123 – 6.417)	0.906
Ct value	1.312 (0.890 – 1.933)	0.170
History of COVID-19	0.733 (0.074 – 7.221)	0.790
Vaccination (Yes)	3.081 (0.566 – 16.781)	0.193
AZD1222	12.174 (1.060 – 139.759)	0.045*
BBV152	3.652 (0.314 – 42.480)	0.301
BNT162b/mRNA-1273	14. 156 (0 – 24.371)	0.999
No. of doses	1.777 (0.687 – 4.596)	0.236
Vaccination prior to COVID-19	8.955 (1.201 – 66.755)	0.032*
Underlying conditions (Yes)	1.276 (0.523 – 3.115)	0.593
Metabolic syndrome	4.475 (0.612 – 32.728)	0.140

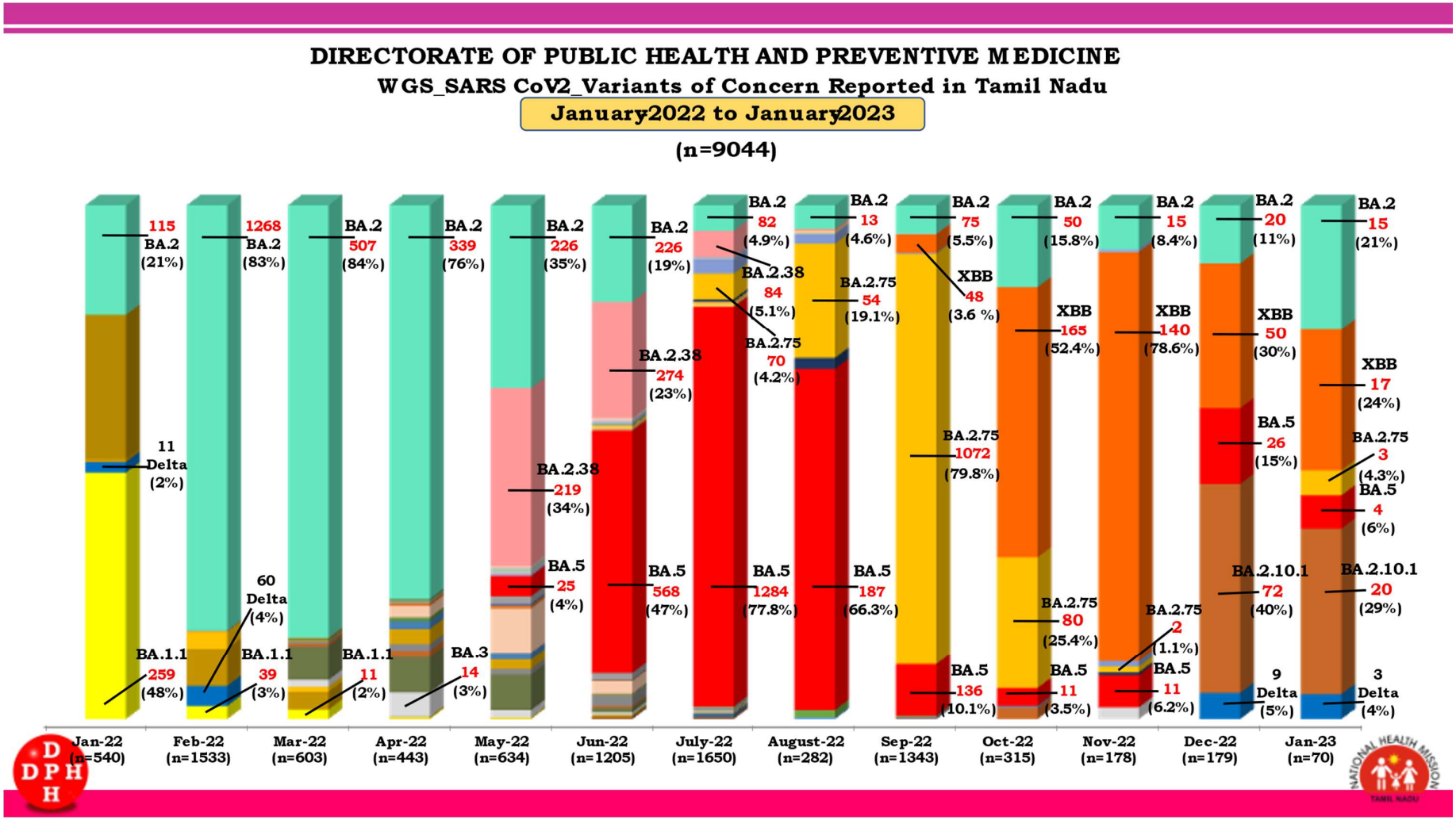
Pregnancy	0 (0 – 0)	0.998
No. of underlying conditions	0.542 (0.196 – 1.496)	0.237
XBB.1	1.773 (0.106 – 29.760)	0.691
XBB.2	0.773 (0.045 – 13.268)	0.859
XBB.3	6.227 (0.376 – 103.241)	0.202
XBB.5	73.651 (0 – 133.478)	0.999
F) HDU/ICU		
Characteristics		
Age (5)	0.747 (0.582 – 0.958)	0.021*
Gender, male	0.435 (0.078 – 2.427)	0.343
Ct value	1.143 (0.860 – 1.519)	0.356
History of COVID-19	0.233 (0.045 – 1.196)	0.081
Vaccination (Yes)	4.217 (0.732 – 24.307)	0.107
AZD1222	2.978 (0.516 – 17.206)	0.223
BBV152	14.164 (0 – 25.163)	0.998
BNT162b/mRNA-1273	14.289 (0 – 31.144)	0.999
No. of doses	1.519 (0.675 – 3.416)	0.313
Vaccination prior to COVID-19	4.432 (0.767 – 25.597)	0.096
Underlying conditions (Yes)	0.933 (0.606 – 1.438)	0.755
Metabolic syndrome	4.564 (0.888 – 23.467)	0.069
Pregnancy	0 (0 – 0)	0.998
No. of underlying conditions	0.517 (0.139 – 0.925)	0.006**
XBB.1	1.773 (0.106 – 29.760)	0.691
XBB.2	7.660 (0 – 18.344)	0.998
XBB.3	3.091 (0.269 – 35.545)	0.365
XBB.5	0.045 (0.015 – 0.750)	0.131
G) Outcome: Terminal illness		
Characteristics		
Age (5)	0.509 (0.313 – 0.828)	0.007**
Gender, male	1.839 (0.330 – 10.231)	0.487
Ct value	1.272 (0.929 – 1.741)	0.134
History of COVID-19	0.480 (0.085 – 2.709)	0.406

Vaccination (Yes)	2.600 (0.707 – 9.560)	0.150
AZD1222	0 (0 – 0)	0.999
BBV152	0 (0 – 0)	0.999
BNT162b/mRNA-1273	0 (0 – 0)	0.999
No. of doses	1.826 (0.877 – 3.801)	0.107
Vaccination prior to COVID-19	2.267 (0.402 – 12.780)	0.353
Underlying conditions (Yes)	1.085 (0.195 – 6.049)	0.926
Metabolic syndrome	0.961 (0.109 – 8.444)	0.971
Pregnancy	0 (0 – 0)	0.998
No. of underlying conditions	0.937 (0.315 – 2.792)	0.907
XBB.1	0 (0 – 0)	0.999
XBB.2	0 (0 – 0)	0.999
XBB.3	0 (0 – 0)	0.999
XBB.5	0 (0 – 0)	0.999

Supplemental Table 8: COVID-19 cases reported in Tamil Nadu during September 2022 – January 2023

Month	No. of samples tested	No. of positives	Positivity (%)
September 2022	491883	15212	3.1
October 2022	319863	5073	1.6
November 2022	230271	1207	0.5
December 2022	146438	285	0.2
January 2023	142585	202	0.1
Grand total	**1331040**	**21979**	**1.7**

Supplemental Figure 1: Emergence of XBB variant in Tamil Nadu during September 2022 – January 2023

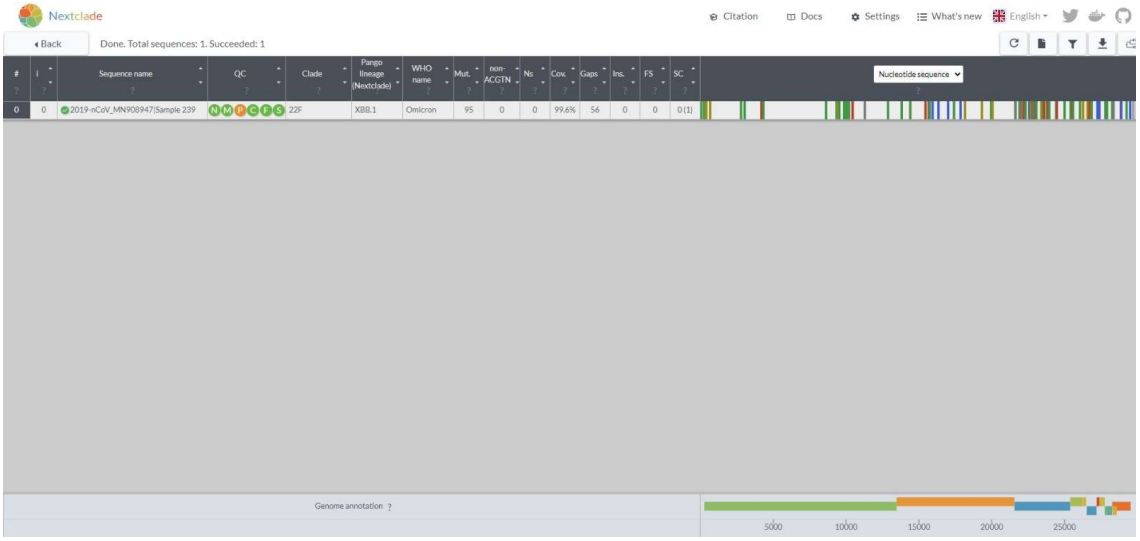


Supplemental Figure 2: Threshold of quality control for consensus generation of sequences

Sequence name	QC	Clade	Pango lineage (Nextclade)	WHO name	Mut.	non-ACGTN	Ns	Cov.	Gaps	Ins.	FS	SC
2019-nCoV_MN908947|Sample 228	N M P C F S	22F	XBB.1	Omicron	91	0	0	99.5%	57	0	1 (1)	0
2019-nCoV_MN908947|Sample 27	N M P C F S	22F	XBB.5	Omicron	104	0	0	99.6%	63	4	1 (1)	0
2019-nCoV_MN908947|Sample 178	N M P C F S	22F	XBB.1	Omicron	100	0	0	99.7%	84	6	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 206	N M P C F S	22F	XBB.5	Omicron	88	0	0	99.6%	88	0	1 (1)	0
2019-nCoV_MN908947|94	N M P C F S	22F	XBB.3	Omicron	93	0	0	99.5%	143	0	2 (2)	0
2019-nCoV_MN908947|Sample 243	N M P C F S	23A	XBB.1.5	Omicron	94	0	0	99.6%	126	0	2 (2)	0 (1)
2019-nCoV_MN908947|Sample 208	N M P C F S	23A	XBB.1.5	Omicron	83	0	0	99.5%	282	1	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 18	N M P C F S	22F	XBB.3	Omicron	96	0	0	99.6%	208	4	2 (2)	0
2019-nCoV_MN908947|Sample 242	N M P C F S	22F	XBB.1	Omicron	97	0	0	99.6%	78	4	2 (2)	0 (1)
2019-nCoV_MN908947|Sample 202	N M P C F S	22F	XBB.1.9	Omicron	87	0	0	99.5%	89	0	1 (1)	0 (1)
2019-nCoV_MN908947|177	N M P C F S	22F	XBB.1.39	Omicron	83	0	0	99.5%	90	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 200	N M P C F S	22F	XBB.2.1	Omicron	94	0	0	99.5%	176	0	2 (3)	0
2019-nCoV_MN908947|Sample 234	N M P C F S	22F	FL.2	Omicron	90	0	0	99.5%	107	0	1 (1)	0 (1)
2019-nCoV_MN908947|59	N M P C F S	22F	XBB	Omicron	87	0	0	99.6%	223	0	3 (4)	0
2019-nCoV_MN908947|Sample 44	N M P C F S	22F	XBB.3	Omicron	91	0	0	99.5%	98	0	3 (3)	0
2019-nCoV_MN908947|Sample 42	N M P C F S	22F	XBB	Omicron	90	0	0	99.5%	126	2	3 (4)	0
2019-nCoV_MN908947|Sample 240	N M P C F S	22F	XBB.1	Omicron	83	0	0	99.5%	272	1	3 (3)	0
2019-nCoV_MN908947|Sample 188	N M P C F S	22F	XBB.1	Omicron	95	0	0	99.6%	136	2	3 (4)	0 (1)
2019-nCoV_MN908947|Sample 241	N M P C F S	22F	FL.5	Omicron	89	0	0	99.5%	93	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 180	N M P C F S	22F	XBB.1.9	Omicron	104	0	0	99.3%	319	8	4 (5)	0 (1)
2019-nCoV_MN908947|Sample 192	N M P C F S	22F	XBB.1	Omicron	160	0	0	99.3%	122	10	3 (3)	0 (1)
2019-nCoV_MN908947|Sample 182	N M P C F S	22F	XBB.6	Omicron	105	0	0	99.5%	705	0	5 (5)	0

Sequence name	QC	Clade	Pango lineage (Nextclade)	WHO name	Mut.	non-ACGTN	Ns	Cov.	Gaps	Ins.	FS	SC
2019-nCoV_MN908947|Sample 199	N M P C F S	22F	XBB.1	Omicron	84	0	0	99.6%	284	0	1 (1)	0
2019-nCoV_MN908947|Sample 209	N M P C F S	23A	XBB.1.5	Omicron	91	0	0	99.5%	57	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 217	N M P C F S	22F	XBB.3	Omicron	94	0	0	99.6%	78	0	1 (1)	0
2019-nCoV_MN908947|Sample 238	N M P C F S	23A	XBB.1.5.18	Omicron	92	0	0	99.6%	79	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 191	N M P C F S	22F	XBB.1	Omicron	101	0	0	99.6%	56	0	0	0
2019-nCoV_MN908947|163	N M P C F S	22F	XBB	Omicron	89	0	0	99.6%	57	0	1 (1)	0
2019-nCoV_MN908947|Sample 195	N M P C F S	22F	XBB.1	Omicron	94	0	0	99.5%	91	0	1 (1)	0
2019-nCoV_MN908947|Sample 143	N M P C F S	22F	XBB.3	Omicron	90	0	0	99.6%	57	0	1 (1)	0
2019-nCoV_MN908947|Sample 181	N M P C F S	22F	XBB.3	Omicron	91	0	0	99.5%	57	0	1 (1)	0
2019-nCoV_MN908947|Sample 197	N M P C F S	22F	XBB.3	Omicron	98	0	0	99.6%	78	0	1 (1)	0
2019-nCoV_MN908947|161	N M P C F S	22F	XBB.3	Omicron	92	0	0	99.6%	57	0	1 (1)	0
2019-nCoV_MN908947|Sample 244	N M P C F S	22F	FL.5	Omicron	97	0	0	99.5%	153	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 215	N M P C F S	22F	XBB.1	Omicron	83	0	0	99.5%	175	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 229	N M P C F S	22F	XBB.1	Omicron	95	0	0	99.7%	57	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 190	N M P C F S	22F	XBB.2.8	Omicron	94	0	0	99.5%	57	1	1 (1)	0
2019-nCoV_MN908947|Sample 205	N M P C F S	22F	XBB.5	Omicron	95	0	0	99.6%	57	0	1 (1)	0
2019-nCoV_MN908947|Sample 233	N M P C F S	22F	XBB.2	Omicron	96	0	0	99.5%	57	0	1 (1)	0
2019-nCoV_MN908947|Sample 203	N M P C F S	22F	XBB	Omicron	96	0	0	99.7%	87	0	1 (1)	0
2019-nCoV_MN908947|Sample 214	N M P C F S	22F	XBB	Omicron	96	0	0	99.7%	87	0	1 (1)	0
2019-nCoV_MN908947|Sample 226	N M P C F S	22F	XBB.1	Omicron	94	0	0	99.5%	82	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 230	N M P C F S	22F	XBB	Omicron	97	0	0	99.5%	166	0	1 (1)	0
2019-nCoV_MN908947|Sample 211	N M P C F S	23A	XBB.1.5	Omicron	95	0	0	99.5%	71	0	0	0 (1)

Sequence name	QC	Clade	Pango lineage (Nextclade)	WHO name	Mut.	non-ACGTN	Ns	Cov.	Gaps	Ins.	FS	SC
2019-nCoV_MN908947|Sample 189	N M P C F S	22F	XBB.1.9	Omicron	89	0	0	99.6%	56	0	0	0 (1)
2019-nCoV_MN908947|Sample 194	N M P C F S	22F	XBB.1.15	Omicron	93	0	0	99.6%	77	0	0	0 (1)
2019-nCoV_MN908947|Sample 225	N M P C F S	22F	XBB.1	Omicron	94	0	0	99.5%	56	0	0	0 (1)
2019-nCoV_MN908947|Sample 198	N M P C F S	22F	XBB.3	Omicron	87	0	0	99.5%	56	0	0	0
2019-nCoV_MN908947|Sample 235	N M P C F S	22F	XBB.1	Omicron	93	0	0	99.8%	56	0	0	0 (1)
2019-nCoV_MN908947|Sample 239	N M P C F S	22F	XBB.1	Omicron	95	0	0	99.6%	56	0	0	0 (1)
2019-nCoV_MN908947|Sample 193	N M P C F S	22F	XBB.2	Omicron	95	0	0	99.5%	56	0	0	0
2019-nCoV_MN908947|19	N M P C F S	22F	XBB.3	Omicron	90	0	0	99.5%	56	0	0	0
2019-nCoV_MN908947|144	N M P C F S	22F	XBB.1	Omicron	88	0	0	99.6%	57	1	1 (1)	0
2019-nCoV_MN908947|41	N M P C F S	22F	XBB.3	Omicron	88	0	0	99.6%	74	0	1 (1)	0
2019-nCoV_MN908947|61	N M P C F S	22F	XBB.5	Omicron	90	0	0	99.5%	72	0	1 (1)	0
2019-nCoV_MN908947|Sample 222	N M P C F S	22F	XBB.1	Omicron	91	0	0	99.5%	99	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 29	N M P C F S	22F	XBB.3	Omicron	92	0	0	99.5%	88	0	1 (1)	0
2019-nCoV_MN908947|Sample 82	N M P C F S	22F	XBB.3	Omicron	89	0	0	99.5%	143	0	1 (1)	0
2019-nCoV_MN908947|95	N M P C F S	22F	XBB.3	Omicron	93	0	0	99.3%	126	0	1 (1)	0
2019-nCoV_MN908947|Sample 124	N M P C F S	22F	XBB	Omicron	91	0	0	99.5%	235	0	1 (1)	0
2019-nCoV_MN908947|Sample 213	N M P C F S	23A	XBB.1.5	Omicron	91	0	0	99.5%	68	1	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 212	N M P C F S	22F	XBB.1	Omicron	94	0	0	99.5%	183	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 231	N M P C F S	22F	FL.10	Omicron	96	0	0	99.5%	57	0	1 (1)	0 (1)
2019-nCoV_MN908947|Sample 201	N M P C F S	22F	XBB.3	Omicron	93	0	0	99.6%	57	0	1 (1)	0
2019-nCoV_MN908947|Sample 207	N M P C F S	22F	XBB.3	Omicron	91	0	0	99.5%	68	0	1 (2)	0
2019-nCoV_MN908947|Sample 43	N M P C F S	22F	XBB.3	Omicron	92	0	0	99.5%	57	0	1 (1)	0
2019-nCoV_MN908947|133	N M P C F S	22F	XBB.3	Omicron	90	0	0	99.5%	56	0	0	0
2019-nCoV_MN908947|24	N M P C F S	22F	XBB.3	Omicron	91	0	0	99.5%	56	0	0	0
2019-nCoV_MN908947|40	N M P C F S	22F	XBB.3	Omicron	89	0	0	99.5%	74	0	0	0
2019-nCoV_MN908947|77	N M P C F S	22F	XBB.5	Omicron	91	0	0	99.5%	56	0	0	0
2019-nCoV_MN908947|Sample 232	N M P C F S	22F	XBB.2.3	Omicron	94	0	0	99.6%	56	0	0	0
2019-nCoV_MN908947|162	N M P C F S	22F	XBB.3	Omicron	91	0	0	99.5%	56	0	0	0
2019-nCoV_MN908947|60	N M P C F S	22F	XBB.3	Omicron	90	0	0	99.6%	61	0	0	0
2019-nCoV_MN908947|Sample 227	N M P C F S	22F	XBB.1	Omicron	91	0	0	99.5%	128	0	0	0 (1)
2019-nCoV_MN908947|174	N M P C F S	22F	XBB.3	Omicron	93	0	0	99.6%	56	0	0	0
2019-nCoV_MN908947|Sample 160	N M P C F S	22F	XBB.3	Omicron	91	0	0	99.5%	89	0	0	0
2019-nCoV_MN908947|Sample 184	N M P C F S	22F	XBB.1.9	Omicron	90	0	0	99.5%	56	0	0	0 (1)
2019-nCoV_MN908947|Sample 221	N M P C F S	22F	XBB.2	Omicron	93	0	0	99.7%	56	0	0	0
2019-nCoV_MN908947|52	N M P C F S	22F	XBB.1	Omicron	87	0	0	99.5%	56	0	0	0
2019-nCoV_MN908947|Sample 237	N M P C F S	23A	XBB.1.5.18	Omicron	94	0	0	99.5%	56	0	0	0 (1)
2019-nCoV_MN908947|Sample 28	N M P C F S	22F	XBB.3	Omicron	93	0	0	99.7%	90	0	0	0
2019-nCoV_MN908947|76	N M P C F S	22F	XBB.3	Omicron	93	0	0	99.5%	56	0	0	0
2019-nCoV_MN908947|Sample 185	N M P C F S	22F	XBB.1.9	Omicron	91	0	0	99.7%	86	0	0	0 (1)
2019-nCoV_MN908947|Sample 186	N M P C F S	22F	XBB.1.9	Omicron	92	0	0	99.4%	30	0	0	0 (1)
2019-nCoV_MN908947|Sample 187	N M P C F S	22F	XBB.1.9	Omicron	92	0	0	99.5%	53	0	0	0 (1)
2019-nCoV_MN908947|Sample 204	N M P C F S	22F	XBB.3	Omicron	89	0	0	99.6%	56	0	0	0
2019-nCoV_MN908947|Sample 179	N M P C F S	22F	XBB.1	Omicron	90	0	0	99.5%	56	0	0	0
2019-nCoV_MN908947|Sample 223	N M P C F S	22F	XBB.2	Omicron	94	0	0	99.6%	127	0	0	0


Nextclade
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Done. Total sequences: 1. Succeeded: 1
| I | Sequence name | QC | Clade | Pango lineage (Nextclade) | WHO name | Mut. | non-ACGTN | Ns | Cov. | Gaps | Ins. | FS | SC | Nucleotide sequence
0 | 0 | 2019-nCoV_MN908947/Sample 239 | N M P C F S | 22F | XBB.1 | Omicron | 95 | 0 | 0 | 99.6% | 56 | 0 | 0 | 0 (1)
Genome annotation
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10000
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20000
25000