

WHO label Lineage	Emergence	Mutations				Impacts on <sup>3</sup>	
		Spike <sup>1</sup>	ORF1ab <sup>2</sup>	Other ORFs <sup>2</sup>	E/M/N <sup>2</sup>		
<b>Alpha</b> <b>B.1.1.7</b>	United Kingdom  September 2020	Δ69-70 Δ144 N501Y A570D D614G P681H T716I S982A D1118H	ORF1a: T1001I ORF1a: A1708D ORF1a: I2230T ORF1a: Δ3675-3677 ORF1b: P314L	ORF8: Q27* ORF8: R52I ORF8: Y73C	N: D3L N: R203K N: G204R N: S235F	Transmissibility: increased  Severity: increased	
<b>Beta</b> <b>B.1.351</b>	South Africa  October 2020	D80A D215G Δ241-243 K417N E484K N501Y D614G A701V	ORF1a: T265I ORF1a: K1655N ORF1a: K3353R ORF1a: Δ3675-3677 ORF1b: P314L	ORF3a: Q57H	N: T205I E: P71L	Transmissibility: increased  Severity: increased	
<b>Delta</b> <b>B.1.617.2</b>	India  December 2020	T19R E156G Δ157-158 L452R T478K D614G P681R D950N	ORF1b: P314L ORF1b: G662S ORF1b: P1000L	ORF3a: S26L ORF7a: V82A ORF7a: T120I ORF8: Δ119-120 ORF9b: T60A	N: D63G N: R203M N: D377Y M: I82T	Transmissibility: increased  Severity: increased	
<b>Eta</b> <b>B.1.525</b>	England, Nigeria  December 2020	Q52R A67V Δ69-70 Δ144 E484K D614G Q677H F888L	ORF1a: T2007I ORF1a: Δ3675-3677 ORF1b: P314F	ORF6: Δ2	N: Δ2 N: D3Y N: A12G N: T205I E: L21F M: I82T	Transmissibility: no evidence  Severity: no evidence	
<b>Omicron</b> <b>BA.1</b>	South Africa  November 2021	A67V Δ69-70 T95I Δ142-144 Y145D Δ211 L212I G339D S371L S373P S375F K417N N440K G446S S477N T478K E484A	Q493R G496S Q498R N501Y Y505H T547K D614G H655Y N679K P681H A701V N764K D796Y N856K Q954H N969K L981F	ORF1a: K856R ORF1a: Δ2083 ORF1a: L2084I ORF1a: A2710T ORF1a: T3255I ORF1a: P3395H ORF1a: Δ3674-3676 ORF1a: I3758V ORF1b: P314L ORF1b: I1566V	ORF9b: P10S ORF9b: Δ27-29	N: P13L N: Δ31-33 N: R203K N: G204R E: T9I M: D3G M: Q19E M: A63T	Transmissibility: increased  Severity: reduced