8 July 2021 Risk assessment for SARS-CoV-2 variant: Delta (VOC-21APR-02, B.1.617.2) Public Health England

Indicator	RAG*	Confidence	Assessment and rationale
Transmissibility between humans		**HIGH**	**Transmissibility appears greater than wild type (first wave) virus.** All analyses support increased transmissibility for Delta compared to both wild type virus and Alpha. There is in vitro evidence suggestive of increased replication in biological systems that model human airway, and evidence of optimised furin cleavage. There is epidemiological evidence from secondary attack rates, household transmission studies, and growth rate modelling. The finding of lower CT values in routine testing data, compared to Alpha, may be relevant to the mechanism of increased transmissibility, however there may be multiple contributors.
Infection severity		**LOW**	**Increased severity (hospitalisation risk) when compared to Alpha.** Iterated analysis continues to suggest an increased risk of hospitalisation compared to contemporaneous Alpha cases. Analyses using 2 different sources of hospital data (SARIwatch sentinel surveillance and routine hospital episode data) do not yet find any evidence of increased severity once in hospital, in hospital inpatients since Delta became predominant. There is a high level of uncertainty in the estimates for the past 2 months due to data lag and these will be iterated. Data from COCIN (hospitalised patients) are broadly consistent with this, but additional analyses are being undertaken to adjust for age and vaccination status.
Immunity after natural infection		**LOW**	**Experimental evidence of functional evasion of natural immunity but insufficient epidemiological data** Pseudovirus and live virus neutralisation using convalescent sera from first wave and Alpha infections shows a reduction in neutralisation**.** National surveillance analyses are underway but there is currently insufficient evidence to assess whether the risk of reinfection differs between Delta and Alpha.
Vaccines		**HIGH**	**Epidemiological and laboratory evidence of reduced vaccine effectiveness** There are now analyses from England and Scotland supporting a reduction in vaccine effectiveness for Delta compared to Alpha against symptomatic infection. This is more pronounced after one dose. Iterated analysis continues to show vaccine effectiveness against Delta is high after 2 doses. Current evidence suggests that VE against hospitalisation is maintained. Although this is observational data subject to some biases, it holds true across several analytic approaches and the same effect is seen in both English and Scottish data. It is strongly supported by pseudovirus and live virus neutralisation data from multiple laboratories. There are no data on whether vaccine effectiveness to prevent transmission is affected.
Overall assessment			Delta is predominant in the UK and there is very rapid global spread. All analyses continue to support increased transmissibility and reduced vaccine effectiveness against symptomatic infection. Whilst risk of hospitalisation appears increased, early data on hospitalised patients does not show indicators of increased severity once in hospital and further analyses are required to resolve this. The priority investigations are to improve understanding of asymptomatic transmission in the vaccinated, to monitor for new mutations occurring on Delta, and continued investigation of the viral kinetics and clinical course of disease.

The therapeutics risk assessment is under review for all variants and is not included.

*refer to scale and confidence grading slide