23 July 2021 Risk assessment for SARS-CoV-2 variant: Beta Public Health England

Indicator	RAG*	Confidence	Assessment and rationale
Transmissibility between humans		MODERATE	**Beta is no more transmissible than Alpha** Experimental data (growth in airway epithelium, and animal to animal transmission) suggest that Beta is not highly fit and is likely to be less transmissible than Alpha. Case numbers in England are too low for reliable estimates of secondary attack rate. Based on GISAID data, Beta has persisted at a low to moderate prevalence in the presence of Alpha in many countries, but it does not appear to become predominant in this context. In countries where Beta has previously been highly prevalent, Delta is now consistently establishing predominance.
Infection severity			**Insufficient information** Case numbers in the UK have been too low to assess severity. There are limited published data available.
Naturally acquired immunity		HIGH	**Experimental evidence of evasion of naturally acquired immunity** There is laboratory evidence of reduction in neutralisation by convalescent sera, from multiple laboratories. Although this is true regardless of the nature of the first infection, preliminary data suggest the effect may be more pronounced in convalescent sera from Delta infections in unvaccinated individuals (LOW confidence). Systematic comparative data on clinical reinfections would be required to raise the risk to red.
Vaccine-derived immunity		MODERATE	**Evidence of decreased vaccine effectiveness** There is robust evidence of reduced neutralisation by sera from vaccinated individuals, across multiple studies and vaccines. The change in neutralisation is greater than for other variants of concern, including Delta. Clinical trial and real-world data support a reduction in vaccine effectiveness against symptomatic infection after two doses, which varies by vaccine (MODERATE confidence). The reduction in vaccine effectiveness is greater for some vaccines than the reduction seen for Delta, but for other vaccines there is equivalent effectiveness for Beta and Delta. There is some evidence that vaccine effectiveness against severe disease is similar to that against Delta, however the data include one study which combines Beta and Gamma, and two studies where the studied population is young and does not reflect the composition of the UK population (LOW confidence for VE against severe disease).
Overall assessment of level and nature of risk, and level of confidence			There is strong laboratory and real-world evidence that Beta is antigenically different to other common variants. The immune experience of the UK population will be shaped by which variants have circulated and which vaccines have been used. This will determine the population vulnerability to Beta and should be further explored. Whilst Beta does not appear highly fit or transmissible compared to the currently prevalent variants, it has still achieved widespread global transmission and it is currently difficult to predict whether it may display a selective advantage in the changing virological, immunological and human behavioural landscape in the UK.

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

*refer to scale and confidence grading slide