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## NEWS BRIEFING

### Covid-19: New coronavirus variant is identified in UK

England's health secretary, Matt Hancock, has told parliament that a new variant of covid-19 has been identified and may be driving infections in the south east, leading to headlines about "mutant covid." **Jacqui Wise** answers some common questions

Jacqui Wise

#### What do we know about this new SARS-CoV-2 variant?

It's been snappily named VUI-202012/01 (the first "Variant Under Investigation" in December 2020) and is defined by a set of 17 changes or mutations. One of the most significant is an N501Y mutation in the spike protein that the virus uses to bind to the human ACE2 receptor. Changes in this part of spike protein may, in theory, result in the virus becoming more infectious and spreading more easily between people.

#### How was the variant detected?

It was picked up by the Covid-19 Genomics UK (COG-UK) consortium, which undertakes random genetic sequencing of positive covid-19 samples around the UK. The consortium is a partnership of the UK's four public health agencies, as well as the Wellcome Sanger Institute and 12 academic institutions.

Since being set up in April 2020 the consortium has sequenced 140 000 virus genomes from people infected with covid-19. It uses the data to track outbreaks, identify variant viruses, and publish a weekly report (<https://www.cogconsortium.uk/data/>).

#### How common is it?

As of 13 December, 1108 cases with this variant had been identified in the UK in nearly 60 different local authorities, although the true number will be much higher. These cases were predominantly in the south east of England, but there have been recent reports from further afield, including Wales and Scotland.

Nick Loman, professor of microbial genomics and bioinformatics at the University of Birmingham, told a briefing by the Science Media Centre on 15 December that the variant was first spotted in late September and now accounts for 20% of viruses sequenced in Norfolk, 10% in Essex, and 3% in Suffolk. "There are no data to suggest it had been imported from abroad, so it is likely to have evolved in the UK," he said.

#### Does this variant spread more quickly?

Matt Hancock told the House of Commons on 14 December that initial analysis showed that the new variant "may be associated" with the recent rise in cases in southeast England. However, this is not the same as saying that it is causing the rise.

Loman explained, "This variant is strongly associated with where we are seeing increasing rates of covid-19. It's a correlation, but we can't say it is causation. But there is striking growth in this variant, which is why we are worried, and it needs urgent follow-up and investigation."

#### Is mutation to be expected?

SARS-CoV-2 is an RNA virus, and mutations arise naturally as the virus replicates. Many thousands of mutations have already arisen, but only a very small minority are likely to be important and to change the virus in an appreciable way. COG-UK says that there are currently around 4000 mutations in the spike protein.

Sharon Peacock, director of COG-UK, told the Science Media Centre briefing, "Mutations are expected and are a natural part of evolution. Many thousands of mutations have already arisen, and the vast majority have no effect on the virus but can be useful as a barcode to monitor outbreaks."

#### Is the new variant more dangerous?

We don't know yet. Mutations that make viruses more infectious don't necessarily make them more dangerous. A number of variants have already been detected in the UK. For example, the D614G variant is believed to have increased the ability of the virus to be transmitted and is now the most common type circulating in the UK, although it doesn't seem to result in more severe disease.

Public Health England's laboratory at Porton Down is currently working to find any evidence that the new variant increases or decreases the severity of disease. Susan Hopkins, joint medical adviser for NHS Test and Trace and Public Health England, said, "There is currently no evidence that this strain causes more severe illness, although it is being detected in a wide geography, especially where there are increased cases being detected."

#### Will the vaccine still work?

The new variant has mutations to the spike protein that the three leading vaccines are targeting. However, vaccines produce antibodies against many regions in the spike protein, so it's unlikely that a single change would make the vaccine less effective.

Over time, as more mutations occur, the vaccine may need to be altered. This happens with seasonal flu, which mutates every year, and the vaccine is adjusted accordingly. The SARS-CoV-2 virus doesn't mutate

as quickly as the flu virus, and the vaccines that have so far proved effective in trials are types that can easily be tweaked if necessary.

Peacock said, “With this variant there is no evidence that it will evade the vaccination or a human immune response. But if there is an instance of vaccine failure or reinfection then that case should be treated as high priority for genetic sequencing.”