UK Health Security Agency

Methodology for estimating daily infections in England: 16 December 2021

Summary

On 13 December 2021, UKHSA estimated that around 24% of all COVID-19 positive cases with specimen dates on 11 December in England, which could be assessed accurately for the presence or absence of multiple genes, did not have a detectable S-Gene and so were highly likely to be the Omicron VOC-21NOV-01 (B.1.1.529) variant. The data on testing came from UKHSA's Second Generation Surveillance System (SGSS). We assumed that:

- this proportion was an unbiased estimate of the proportion of Omicron cases
- the lag between infections and specimen dates was 4 days
- there were 78,000 Delta infections in England on the 7 December, based on modelled daily incidence for 21 November 2021 (ONS Infection Survey)

These inputs are sufficient to estimate that on 7 December there were approximately 25,000 daily Omicron infections. By assuming a constant doubling time of 1.9 days, the figure below plots daily Omicron infections using this starting point. Assuming this constant doubling time, UKHSA estimates that, during the day of 13 December, just over 200,000 people were infected with the Omicron variant. Using different assumptions for the starting number of infections only has small implications for the trajectory of the chart below. The path of modelled future infections is highly sensitive to the estimated doubling time over the modelled period. Using the 95% credible interval of the doubling time estimates derived by UKHSA (1.5 to 2.4) suggests the value was between (140,000 and 390,000).

This analysis assumes the doubling time remains constant between 7 to 13 December. Because this assumption will have become less valid since then due to behaviour change, this method of nowcasting the number of new infections is not going to be used moving forward.