

# COVID-19 tests: what is the Number-Needed-to-Detect (NND)?

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The UK government is encouraging everyone over the age of 11 years to test themselves twice a week for COVID-19 using lateral flow tests on nasal swabs. But what does a positive result mean?

Test performance depends on the pre-test probability that the person being tested has the disease.

The Xiamen Biotime lateral flow COVID-19 test



**Matt Hancock** – Health Secretary

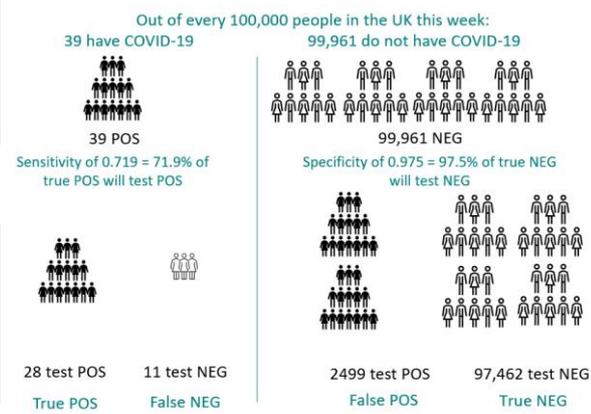
Rapid testing is a "vital part" of the roadmap out of lockdown, "helping us to cautiously lift restrictions on our economy and society".

No tests are 100% accurate, but people are asked to self-isolate on the basis of a positive rapid test result. A person with a negative test result needs to know whether they are at risk of spreading the infection to vulnerable contacts, but a false positive test has financial and social implications for their family. As herd immunity increases, the background prevalence of COVID-19 is falling, which may affect the interpretation of a positive or negative test result.

## Performance of six SARS-CoV-2 immunoassays in comparison with microneutralisation<sup>1</sup>

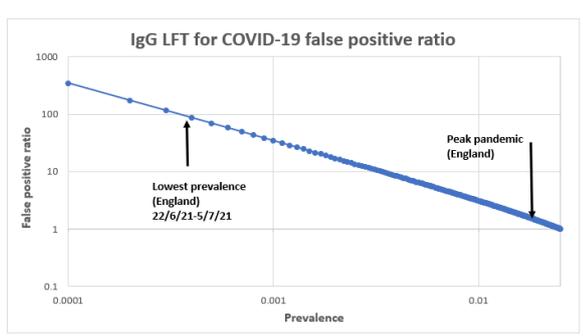
<b>Objective</b>	<ul style="list-style-type: none"> <li>To compare the performance of 6 commercial immunoassays for COVID-19 against a microneutralisation test</li> </ul>
<b>Methods</b>	<ul style="list-style-type: none"> <li>Test performance was compared on 70 serum samples from PCR-confirmed COVID-19-positive patients in Finland from 2020 and 81 COVID-19-negative samples from 2018-2019.</li> <li>One of the 6 tests was the Xiamen Biotime Biotechnology rapid lateral flow SARS-COV-2 IgG/IgM test that is being sent out to the UK population.</li> </ul>
<b>Results</b>	<ul style="list-style-type: none"> <li>The Xiamen IgG test had a sensitivity of 71.9% and specificity of 97.5%.</li> <li>The Xiamen IgM test had a sensitivity of 81.3% and specificity of 88.8%.</li> <li>Prevalence of COVID-19 in the UK this week is 39 cases/100,000 people<sup>2</sup>. This means...</li> </ul>

**True and false positive and negative test results at a baseline prevalence of 39 cases/100,000**



**Our interpretation:**

- If you test negative, be reassured: you are very unlikely to be spreading COVID-19 to others.
- The number of people who need to test positive to detect 1 infected person (NND) changes based on the prevalence. The NND in England today, June 2021 is 90, in January 2021 (2080 cases/100,000) it was 1.3
- If you test positive, you are 28.5 times more likely to have COVID than someone who tested negative (a PCR test would clarify this).



1. Jääskeläinen, AJ, Kuivanenb S, Kekäläinen E et al. (2020). Performance of six SARS-CoV-2 immunoassays in comparison with microneutralisation. J Clin Virology 129: 104512 <https://doi.org/10.1016/j.jcv.2020.104512>  
2. <https://coronavirus.data.gov.uk/>