Self-testing for covid-19

Adding oropharyngeal to nasal sampling is not the answer to underperforming tests

Timothy Feeney,1,2 Charles Poole2

In a linked paper, Schuit and colleagues (doi:10.1136/bmj-2022-071215) tackle the issue of self-testing for covid-19.1 Despite a recent meta-analysis of the sensitivity and specificity of single sample testing, self-testing remains a vexing problem with many open questions.2 The authors attempt to answer two of the main ones: Does augmentation of nasal sampling with sampling from additional sites, such as the oropharynx, increase sensitivity, specificity, or both? And do these performance metrics change with the emergence of different viral types such as omicron subvariants?

Schuit and colleagues conducted a prospective study within the Netherlands public testing programme to evaluate three widely used covid-19 tests: Flowflex (Acon Laboratories), MPBio MP Biomedicals), and Clinitest (Siemens-Healthineers). Between December 2021 and February 2022, the authors identified and recruited 3076 adults seeking self-testing who either had symptoms consistent with covid-19, been in close contact with an infected individual, a recent positive antigen self-test result, or returned from a high prevalence region. All participants had a polymerase chain reaction test for covid-19, then performed an antigen based self-test at home “as soon as possible, and within three hours.” This approach, the authors hoped, would alleviate concerns of a Hawthorne effect altering self-testing behaviour.

Overall, nasal sampling yielded sensitivities between 69.9% and 79.0% and specificities all greater than 92%. Although these sensitivities and specificities are lower than manufacturers’ claims,3–5 they are broadly consistent with the findings of a previous meta-analysis and these authors’ previous work.6–8 However, confirmatory tests had markedly higher sensitivities than tests done for other reasons—roughly 20% higher. This seems a remarkable difference, and the reason emerges from the subanalyses of viral loads—tests perform better in adults with higher viral loads. How these viral loads influence infectivity is not examined in this study, but reviews suggest higher viral loads increase infectivity.7–8

Sensitivities increased slightly to 77.3% and 83.0% when oropharyngeal sampling was added to nasal sampling. Specificities remained comparable with nasal sampling alone, at greater than 93%. Notably, adding oropharyngeal testing was the only scenario in which overall test results satisfied thresholds for performance promoted by the World Health Organization.9 The increase in sensitivity was test dependent: MPBio had noticeably better sensitivity with dual site testing, whereas Clinitest’s improvement was more modest. No test, however, reached anywhere near the level of performance advertised by the manufacturers. It is not yet clear whether this is a design limitation of the tests and whether new tests designed specifically for use at both sites would perform better, or whether oropharyngeal samples simply do not add much viral material beyond that obtained by nasal swabbing.

One bright spot in these data is that despite small reductions in sensitivity with some brands (Clinitest), test sensitivities remained fairly robust to the increasing prevalence of omicron variants. Helpfully for consumers, recent variants seem to have had little effect on the usefulness of tests done at home. However, we need to remain vigilant as new variants such as BA.2.75, BA.4, BA.5, and others emerge.

What should we take from this study? Firstly, that members of the general public are capable of doing their own nasal (and potentially oropharyngeal) sampling for covid-19 testing, but the real world performance of antigen tests remains highly variable. Secondly, adding oropharyngeal testing may provide some benefit, although it is unclear how many test kits are capable of expanded use, and serial testing could be a more workable change to testing protocols. Finally, and most importantly, are the policy implications. In the UK and the US, policies governing use of tests to enable a return to normal activities are confusing, poorly explained, and frequently change. In the US, a single negative test result currently allows an individual to return to work or school in many situations. In the UK, government guidance suggests that a negative result “means it’s likely you are not infectious.”10–11

Such simple guidance is inconsistent with Schuit and colleagues’ findings—a single negative test result cannot be interpreted in a vacuum. Individuals must also consider their reason for being tested; have they been exposed to an infected person or been in a high risk situation such as a crowded indoor space during a period of high transmission?, has enough time passed to accrue a high viral load?, and, of course, do they have symptoms consistent with covid-19? All are important considerations that will help optimise the value of these tests in limiting spread and containing new variants as we learn to live with covid-19.

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