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## **NEWS ANALYSIS**

# Covid-19: Rapid testing cuts cases in pilot but questions remain over use of lateral flow tests

An evaluation has found that community testing in Liverpool reduced cases of covid-19, but experts say more evidence is needed on the use of rapid tests, reports **Jacqui Wise** 

#### Jacqui Wise

A full evaluation of the community testing pilot scheme in Liverpool concluded that it led to a reduction of around a fifth in covid-19 cases compared with control areas.<sup>1</sup>

Researchers who carried out the study said mass testing of asymptomatic people using rapid lateral flow tests (LFTs) gave a significant time advantage over polymerase chain reaction (PCR) testing so that those who tested positive could self-isolate promptly.

But some experts said the results do not provide justification for the government's national mass testing programme, and said more evidence was required to understand how best to use rapid LFTs in the community.

Between 6 November 2020 and 30 April 2021, 283 338 (57%) of Liverpool residents took a test using the Innova SARS-CoV-2 rapid antigen lateral flow device. Of these, 47% had more than one test and in the same period 152 609 residents were tested by PCR. During this time 6300 people who declared no symptoms tested positive by LFT—a case positivity of 2.1%. Of these, 3547 received a confirmatory PCR test within five days.

The study, by the University of Liverpool and the Department of Health and Social Care, concluded that community testing led to an 18% increase in case detection (95% confidence interval 7% to 29%) and a 21% reduction in cases (95% CI 12% to 27%) compared with control areas up to mid-December 2020, after which the surge of the Kent variant made it difficult to compare areas.

#### Infections prevented

The researchers said between 850 and 6600 infections were prevented depending on whether a "pessimistic" or "optimistic" model was used.

"The time to get people to self-isolate is absolutely critical," said Iain Buchan, dean of the Institute of Population Health, who led the evaluation. He told a Science Media Centre briefing that LFTs, which give results in 30 minutes, give a 1-2 day time advantage over PCR tests.

Calum Semple, professor of outbreak medicine at the University of Liverpool and a member of SAGE, said that rapid testing is an incredibly valuable tool that allows society to keep functioning. He added, "If someone has a tickly throat and has a LFT that is positive they then have immediate reinforcement to take action." The interim results of the national pilot were reported in December and showed that the rapid test kits missed over half of cases.<sup>2</sup> The full evaluation of the test's performance, published in *The BMJ*,<sup>3</sup> said that when the accuracy of LFTs was assessed against PCR results, the overall sensitivity of the Innova test was 40%. The specificity was found to be 99.9%, the positive predictive value is 90.3%, and the negative predictive value is 99.2%. The report says that in cases with a high viral load the LFT is likely to detect at least three fifths, and at most 998 in every 1000 positive cases.

"It worked as expected and is a valuable tool—within a wider public health response for identifying people with higher vital loads, who are more likely to be infectious, but who do not report classical symptoms," the Liverpool evaluation report said.

## Reluctance to self-isolate in deprived areas

The pilot found that people living in more deprived areas were less likely to take up testing and more likely to test positive. Sally Sheard, head of the department of public health at the Institute of Population Health, University of Liverpool, said, "There was a genuine fear that they would lose income if they had to self-isolate." She added that before the pilot it was assumed that everyone had digital access and it was a "staggering learning point" to find that some people didn't have phones, or credit on their phone, or internet access.

As well as general community testing the researchers carried out additional LFT testing in 11 care homes for staff and to readmit visitors. Many staff members in the care homes did not participate and most had less than 25% adherence to the study protocol. As a consequence, the care homes taking part in the pilot still experienced outbreaks as the Kent variant surged in December 2020. The researchers said the main barriers to enhanced testing were staff workload, morale, and conflicting communication.

A small pilot scheme with daily contact testing for key workers who are a contact of a confirmed case as "test to release" was useful in sustaining key services with more than 3200 key worker staff days protected from quarantine. A total of 17 cases were identified among 768 participants in the scheme from Merseyside Police, Merseyside Fire and Rescue Service, Alder Hey Children's Hospital, and small private care providers. Liverpool's director of public health, Matthew Ashton, said the use of LFTs gives the "opportunity to close down outbreaks at a much earlier stage by large scale hyperlocal deployment of testing." He said that the development of the Combined Intelligence for Population Health Action system<sup>4</sup> was an important part of the armoury to detect patterns of infection and target resources effectively. This dashboard is now expanding to other regions and could contribute to building up a national grid of public health data systems needed to improve pandemic responses.

### More evidence needed on how to use LFTs

Alexander Edwards, associate professor in biomedical technology at University of Reading, said that while it was positive to see the findings published, "we still need more evidence to understand how best to use LFTs in the community."

"They remain cheap and more accessible than lab tests, but remain limited in analytical performance," he added. "We can't find out the impact of testing on transmission rates in this particular location or time period because too many interventions and changes took place at the same time. Furthermore, reducing cases by 20% during a period of exponential growth may not be enough to significantly change the path of an outbreak."

Angela Raffle, consultant in public health and honorary senior lecturer at the University of Bristol Medical School, commented, "The evidence in this report provides no justification for the government's multi-billion pound initiative of widespread self-testing with an inadequately evaluated lateral flow test used outside of the actual manufacturer's recommendations."

Raffle noted there were no predetermined control areas, and the 21% figure is derived from modelling and assumptions. She also pointed out that from mid-December case rates in Liverpool rose as quickly as or more rapidly than in other areas that had no asymptomatic testing, despite the fact that the Liverpool testing pilot continued until 30 April 2021. "Another weakness of the report is the lack of analysis of the resources that were needed for population wide testing, and whether this represents best value compared with other potential uses," she added.

#### Correction: On 12 July 2021 we corrected the spelling of Iain Buchan's name.

- Department of Health and Social Care. Liverpool coronavirus community testing pilot: full evaluation report summary. 7 July 2021. www.gov.uk/government/publications/liverpool-coronavirus-covid-19-community-testing-pilot-full-evaluation-report-summary/liverpool-coronaviruscovid-19-community-testing-pilot-full-evaluation-report-summary.
- 2 Wise J. Covid-19: Lateral flow tests miss over half of cases, Liverpool pilot data show. BMJ 2020;371:m4848. doi: 10.1136/bmj.m4848 pmid: 33323368
- <sup>3</sup> García-Fiñana M, Hughes DM, Cheyne CP, et al. Performance of the Innova SARS-CoV-2 antigen rapid lateral flow test in the Liverpool asymptomatic testing pilot: population based cohort study. *BMJ* 2021;374:n1637. doi: 10.1136/bmj.n1637 pmid: 34230058
- 4 Combined intelligence for population health action. www.cipha.nhs.uk.

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