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Covid-19: Mass population testing is rolled out in Liverpool

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Liverpool will this week become the first city in England to roll out mass testing of its population for covid-19.

All people living or working in Liverpool will be offered covid-19 tests from Friday 6 November, regardless of whether they have symptoms, under a government pilot scheme that will screen as many as half a million people in the city.

The pilot will test the feasibility of the government's ambitious plans for mass population screening throughout England, as *The BMJ* first revealed in the leaked Operation Moonshot documents in September.¹ The army will provide logistical support, with 2000 personnel deployed from Thursday 5 November.

Several types of covid tests will be used in the pilot (see box), including existing polymerase chain reaction (PCR) swab tests, new lateral flow swab tests that can turn around results without the need to be processed in a laboratory, and new LAMP technology that will be deployed in Liverpool University Hospitals NHS Foundation Trust for NHS staff.

Liverpool has one of the highest rates of covid-19 in England (410.4 per 100 000 for 18-25 October) and was the first area of England to be placed under very high alert last month,² before the government's announcement of a new national lockdown³ starting on 5 November.

The prime minister, Boris Johnson, said that the pilot scheme, which has been backed by local leaders, would help to identify many asymptomatic people who could still infect others without knowing.

"Dependent on their success in Liverpool, we will aim to distribute millions of these new rapid tests between now and Christmas and empower local communities to use them to drive down transmission in their areas," he said. "It is early days, but this kind of mass testing has the potential to be a powerful new weapon in our fight against covid-19."

Various testing sites

People will be able to book tests online, in person, or by invitation from the local authority, and testing will take place at various sites including hospitals, care homes, schools, universities, workplaces, or at home. Any positive test results will be collected and published by the national NHS Test and Trace system.

Commenting on the roll-out, Alexander Edwards, associate professor in biomedical technology at the University of Reading, said, "As a pilot study, there are plenty of potential benefits if we can learn about real world performance of mass testing methodology. The underlying questions about accuracy, speed, and acceptability must be carefully measured alongside gaining technical and logistical experience."

Luke Allen, GP academic clinical fellow at the University of Oxford, said, "If it can be implemented smoothly then we will have a much clearer picture of how the virus is spreading. There are several big 'ifs,' though: people need to show up for testing, testing should happen repeatedly in order to track changes over time, and—most importantly—the track and trace system needs to function effectively."

Which tests will be used in Liverpool?

RT-PCR (reverse transcription polymerase chain reaction) swab tests

To date, these tests have been used as the default test during the pandemic. They involve taking a throat and nose swab. The tests look for the genetic code (RNA) of the virus and have been used to show whether a person with symptoms currently has covid-19. They can produce a result in 3-4 hours, but this takes longer if samples have to be sent to external laboratories.

Lateral flow tests

These tests detect whether the virus is present by applying a nose and throat swab to a special test kit. These small, portable tests display a point-of-care result like a pregnancy test in 15-30 minutes, without the need to be processed in a laboratory. They detect the virus directly without the amplification steps of RT-PCR or LAMP. An independent evaluation of one test (the SD Biosensor test) found that it had a clinical specificity of 99.3% and a clinical sensitivity of 76.6%.⁴

LAMP (loop mediated isothermal amplification)

This is a new type of testing technology that allows significant volumes of tests to be delivered in hospital laboratories. As with RT-PCR, LAMP detects whether viral RNA is present. It also involves collecting nose or throat swabs but can also use samples from mucus produced by hard coughing. It can produce results in 2-3 hours. The leaked Moonshot documents seen by *The BMJ* listed LAMP tests as having a "lower sensitivity" of 80-100%.

Correction: We amended this article on 3 November 2020 to clarify the infection rate mentioned in the fifth paragraph.

- 1 Iacobucci G, Coombes R. Covid-19: Government plans to spend £100bn on expanding testing to 10 million a day. *BMJ* 2020;370:m3520. doi: 10.1136/bmj.m3520 pmid: 32907851
- 2 Iacobucci G. Covid-19: Three tier alert system takes effect across England. *BMJ* 2020;371:m3961. doi: 10.1136/bmj.m3961 pmid: 33051180
- 3 Kmietowicz Z. Covid-19: "There is no alternative," says Johnson, announcing new restrictions for England. *BMJ* 2020;371:m4247 doi: 10.1136/bmj.m4247.
- 4 FIND. FIND evaluation of SD Biosensor, Inc. STANDARD Q COVID-19 ag test, external report (version 1.0). 18 Sep 2020. https://www.finddx.org/wp-content/uploads/2020/09/SDQ-Ag-Public-Report_20200918.pdf.

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