

Why pooled PCR tests are our best bet | India Today

Insight

The technique reduces the workload on labs and can help map the spread of COVID-19

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Rohit Dutta, Uttar Pradesh's first COVID-19 case who has since recovered, recalls that the toughest part about the ordeal at the time was waiting for the test results of his family members. Back then, with limited testing labs and test kits in the country, it took almost three days. Today, entire households in the outskirts of Agra are receiving their test results in one go, thanks to the introduction of pooled RT-PCR (reverse transcription-polymerase chain reaction) tests in the city. According to Indian Council of Medical Research (ICMR) guidelines, samples of no more than five can be clubbed and tested together in the RT-PCR machine. This form of testing has been recommended for areas with 2 to 5 per cent infection rate and only on asymptomatic people who are not high-risk. This form of testing is not meant for areas where the infection rate is already above 5 per cent. For the first round of such tests conducted on April 16, a buffer zone of a 5 km radius outside Agra was selected. All 150 samples collected tested negative.

“If you use more than five samples, the chances of false negatives will be much higher,” says Dr Anjali Jain, head of department of microbiology at King George's Medical College, Lucknow, the only lab approved to run pooled tests in the state. Dr Jain was also a part of the team which conducted the

feasibility study for pooled testing for ICMR, based on which the present guidelines have been drawn up. “It will certainly help in areas with low or no infection, to give an idea of the spread of the disease. If a pooled test runs negative, it means none of the five samples had the DNA of the virus. But if it is positive, then each individual will have to be tested again to determine who is positive and who is negative. It is not recommended for zones with a higher infection rate, because you need to isolate and treat people quickly. In coldspots, the assumption is that infection hasn’t spread and pooled tests are a way to double-check with few resources,” says Dr Jain. Unlike the rapid blood tests, which require a follow-up PCR test, negative pooled tests are confirmatory.

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Uttar Pradesh--with 1,192 infected individuals and 17 deaths as on April 20--has one of the lowest testing rates in the country, despite being the most populous state with over 230 million people. As of April 18, the state had performed around 23,000 tests or 100 tests per million through its 15 government labs and two private labs. South Korea, which has managed to flatten its spread of infections through aggressive testing, started to see results after its testing rate reached around 5,000 per million. To get to that figure, Uttar Pradesh needs to test 11.5 million individuals.

“Pooled testing and rapid testing are a quick way to detect prevalence of COVID in an area,” says Dr Jain. A study by Texas A&M University, the Washington-based Center for Disease Dynamics, Economics & Policy (CDDEP) and Princeton last month stated the same. The researchers found that for 256 individuals, if around 7.3 tests were run, it would be possible to detect between 1 to 5 per cent infection rates of COVID-19 in an area with 95 per cent accuracy and only a 4 per cent probability of false alarm. ‘The pooling of RT-PCR samples is a cost-effective technique for providing much-

needed course-grained data on the prevalence of COVID-19. This is a powerful tool in providing countries with information that can facilitate a response to the pandemic that is evidence-based and saves the most lives possible with the resources available,' the study noted.

With a global shortage of PCR kits and kit components, many countries have begun exploring pooled tests, including Germany, the US and Italy. In India, Andaman and Nicobar and Uttar Pradesh have begun the tests while Gujarat, Maharashtra and Rajasthan are looking to follow. "Pooled testing will save resources and reduce workload on labs. The RT-PCR is reliable but it requires investment in terms of machine, manpower and parts of the kit," says Dr Ranadhir Chakraborty, professor at the department of biotechnology, University of North Bengal. There are also substitute COVID tests being designed at breakneck speed in India, including the Crispr paper test, RT-Lamp test and a quick antibody blood test. But till they receive regulatory approvals and begin mass production, pooled tests are the best bet for a country where the test rate so far is only 290 per million.