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## Covid-19: Timing is critical for antibody tests, finds Cochrane review

Jacqui Wise

A Cochrane systematic review has found that, when it comes to antibody testing for covid-19, timing is everything.

The review of 54 studies found that antibody tests carried one week after a patient first developed symptoms detected only 30% of people who had covid-19. Accuracy increased in to 72% at two weeks and to 94% in the third week.<sup>1</sup>

“If you use them at the wrong time they don’t work,” said Jon Deeks, professor of biostatistics at the University of Birmingham and the review’s lead author.

The duration of rises in antibodies is also currently unknown, and the researchers found very little data beyond 35 days after the start of symptoms. Another problem is that the data mainly came from hospital patients, so it is unclear whether the tests are able to detect the lower antibody concentrations likely seen with milder and asymptomatic covid-19.

The review included only published studies or studies available as preprints up to 27 April 2020 and does not include the Roche or Abbot antibody tests. In May the UK government purchased 10 million test kits from the two companies after Public Health England said it had validated them.<sup>2</sup>

On 25 May NHS England and NHS Improvement wrote to NHS trusts and general practices telling them to roll out antibody testing to NHS staff and patients who wanted to know whether they had been infected with the covid-19 virus.<sup>3</sup> However, in a letter published in *The BMJ* this week,<sup>4</sup> a group of senior clinical academics and physicians publicly questioned the government’s antibody testing strategy, arguing that the only current justification for large scale antibody testing was for research purposes.

Speaking at a Science Media Centre briefing, Deeks said he agreed with the letter. “We don’t know what to tell people when they have a positive antibody test. We don’t yet know if a positive test indicates immunity, and no clinical decision can be made based on the results.”

Deeks said that antibody testing organised on an individual level doesn’t help us understand the big questions and should be coordinated with public health input. However, it could be useful, if done systematically, to help understand how covid-19 was being transmitted. For example, in a healthcare setting if it was seen that cleaners or porters were getting the disease it could then help inform the provision of personal protective equipment.

Jac Dinnes, a senior researcher in public health and a coauthor of the Cochrane review, said, “The design, execution, and reporting of studies of the accuracy of covid-19 tests require considerable improvement. Studies must report data broken down by time since onset of symptoms.” She added, “Action is needed to ensure that all results of test evaluations are available in the public domain to prevent selective reporting.”

Of the studies included in the Cochrane review 38 were conducted in Asia, 15 in Europe, and one in both the US and China. The studies included almost 16 000 samples, although it is not clear how many patients this represented. “A lot of studies had multiple samples per patient and so it makes the results look falsely precise,” Deeks said.

Data were available for only 27 tests, a small fraction of the 316 commercially available tests. Data were available on laboratory based tests, which require blood samples taken from the veins, and point of care tests, which can use finger prick blood samples. However, there were not enough data to compare the accuracy of different tests.

The review will continue to be updated over the next few months to include more research evidence—including any from the Roche or Abbot tests—as it becomes available.

- 1 Deeks JJ, Dinnes J, Takwoingi Y, et al. Antibody tests for identification of current and past infection with SARS-CoV-2. *Cochrane Database Syst Rev* 2020;6.
- 2 Public Health England. Covid-19: laboratory evaluations of serological assays. 19 May 2020. <https://www.gov.uk/government/publications/covid-19-laboratory-evaluations-of-serological-assays>.
- 3 NHS England. Antibody testing programme roll out for NHS staff and patients [letter]. 25 May 2020. <https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/05/antibody-testing-programme-letter-25-may-2020.pdf>.
- 4 Andersson M, Low N, French N, et al. Rapid roll out of SARS-CoV-2 antibody testing—a concern. *BMJ* 2020;369:m2420doi: 10.1136/bmj.m2420.