

# Variables can affect accuracy

## Experts: You're not out of the woods if you test negative

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**PETALING JAYA:** Even if a person has tested negative for Covid-19, they should not think they are "out of the woods" yet, Malaysian virologists caution.

With more Malaysians undergoing Covid-19 tests as the country grapples with a surge in cases, experts said that a range of factors could affect the accuracy of such tests.

Assoc Prof Dr Chee Hui Yee of Universiti Putra Malaysia's Medical Microbiology and Parasitology Department said how the samples were collected, stored and transported to the laboratory could affect the results of tests for the coronavirus.

"The person collecting the samples will need to collect sufficient infected cells in order for the virus to be detected.

"So it is important to look at how deep the sampling tip goes into the right nostril and how many times the healthcare worker has to turn the tip. They should swab the nostril three or four times.

"The accuracy of the tests also depends on how the healthcare workers store the samples before they get transported to the lab, as this virus is sensitive to heat, and may die and the viral ribonucleic acid (RNA) becomes degraded.

"For those of us working in the lab, we will reject any samples that



are not cold because these have not been stored well and it will definitely affect the outcome," she said.

Different tests, she explained, also have different sensitivity rates.

Dr Chee noted that the RT-PCR (reverse transcription-polymerase chain reaction) test was generally considered to be about 80% to 90% sensitive and can yield results within three hours, while the rapid antigen tests could yield results within half an hour, though it is about 50% to 60% sensitive.

"Timing also matters," she added, as a pre-symptomatic person who gets tested before the Covid-19 virus "multiplies" in the body may not get screened as being positive.

She said the viral load, which refers to the amount of virus in an infected person's body, also affected the results of the tests.

"The higher the Ct (cycle threshold) value, the lower the virus load. Each test kit has a different threshold for what it determines to be Covid-19-positive, so there are differences in terms of defining what is positive.

"With the test kit performance, combined with factors surrounding how competent lab personnel are,

definitely there is no 100% accuracy in the test results," she said.

As such, Dr Chee said even if someone had tested negative for Covid-19, they should not necessarily take it to mean that they were virus-free.

"If you have very close contact with an index case, are displaying symptoms or coming from high-risk areas, you are strongly advised to perform self-quarantine.

"You need to wear a mask, and practise hand hygiene and physical distancing. Try not to interact with others until the symptoms subside," she advised.

Universiti Malaya virologist Prof Dr Sazaly Abu Bakar said a range of variables could affect how accurately Covid-19 cases can be screened and detected.

"The issue about testing is to see how well the samples are taken and it is highly dependent on the staff member who took the nasal swab.

"If you are exposed, let's say if someone with the infection coughs on you and you inhale it into the nasopharynx, the mucus will trap the virus there.

"If it just so happens that the virus has successfully docked and multiplied and causes enough damage to the cells, only then can the test could detect it, if the swab is taken properly.

"However, if the swab does not touch the infected cell, then the test would come out as negative," he said.

Besides the sampling techniques, he said the accuracy of the results depended on whether sufficient virus replication had taken place and how long the person was tested after he was first infected.

"Some viruses replicate slowly and that's why it takes a longer period of time to detect.

"For Covid-19, it will take about five to seven days before you can detect it.

"If someone is tested negative, they are not out of the woods yet, they have to do another test. They cannot rely on a single test," he said.

Prof Sazaly also urged Malaysia to be cautious of facing "frontliners' fatigue".

As the stakes are higher now for health workers to collect quality samples from large groups of people such as the Sabah returnees, he said measures must be taken to ensure they were not burnt out.

"Especially as people are arriving at the airport at different times, we must make sure the frontliners are trained, healthy and get enough rest," he said.

Recently, American news channel CNN interviewed GQ correspondent Julia Ioffe about how she was tested negative for Covid-19 four times, although doctors later agreed that she had the virus.

In an article published in the lifestyle men's magazine, Ioffe wrote of her false negative Covid-19 results, and also provided insights into the accuracy of the tests.