

Covid-19: which tests to trust in 2021?

Press release of the French National Academy of Medicine

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While the national vaccination campaign against SARS-Cov-2 is in full swing, the fight against the Covid-19 epidemic is entering a phase of uncertainty with the threat raised by the rapid spread of more transmissible variant viruses.

Following the Ministry of Solidarity and Health's directive "Test - Alert - Protect", the use of new techniques was proposed in October 2020 to facilitate sampling and reduce response times both to diagnosis and screening [1]. Recommendations have been issued by the French National Authority for Health (HAS) concerning the tests to be used on the basis of their technical and clinical performance [2 - 4], but the impact that mutations caused by variants can have on this performance must now be taken into account.

- RT-PCR tests are the reference tests for detecting the viral genome in nasopharyngeal swabs. They can also be performed on saliva samples, easier to collect and more readily accepted, with a comparable performance [2.5]. These tests are paid by the Health Insurance and do not require a medical prescription. New screening RT-PCR and multiplex PCR kits are being developed to detect the new variants that have emerged in the UK, South Africa and Brazil.

- RT-LAMP is an isothermal amplification test without RNA extraction, which can be used on nasopharyngeal or salivary samples, but whose analytical performance is lower than that of RT-PCR. It can be used on integrated systems, only in symptomatic subjects [3], but no results have been reported on its ability to detect variants.

- Antigenic tests allow detection of the virus in nasal swabs and can be carried out in many pharmacies. These are rapid diagnostic orientation tests (RDTs), which are less sensitive than RT-PCR tests, but have the advantage of providing a result in less than half an hour, which facilitates their use in screening [4]. Their performance in detecting variants is currently being evaluated.

- Serological tests detect antibodies to SARS-CoV-2 and provide information on whether or not the subject has been infected by the virus. They are carried out in Medical Analysis Laboratories, on blood, venous or capillary samples. ELISA tests are to be preferred to rapid tests because their analytical performance is higher, particularly for identifying antibodies against epitopes that may be altered due to genetic mutations.

- Self-tests are carried out on a self-sample, either saliva for virus detection or blood, by pricking the fingertip for antibody detection. Their uneven performance, not evaluated in real conditions,

makes their use hazardous. Mishandling and misinterpretation of the results can induce false feelings of security or anxiety, leading to inappropriate behavior.

In view of the unstable epidemiological situation of Covid-19 threatened by the spread of new variants, **the National Academy of Medicine recommends:**

- to choose the diagnostic and screening tests currently on the market on the basis of their performance in respect of SARS-CoV-2 variants;
- to preferably use RT-PCR tests on nasopharyngeal swabs or salivary samples and to increase their accessibility throughout the country;
- to make a widespread use of validated rapid tests (antigenic and serological TRODs, RT-LAMP), particularly for mass screening programs in communities, and to confirm positive results by RT-PCR;
- not to use self-tests because of their poor reliability and their non-registration in the SIDEPE database, which provides essential indicators for monitoring the epidemic.

[1] Press release of the French National Academy of Medicine and the National Academy of Pharmacy "Covid-19 tests: searching a strategy", October 9, 2020.

[2] A quick review of RT-PCR SARS-CoV-2 tests on saliva samples. French Haute Autorité de Santé, September 18, 2020

[3] A quick review of RTLAMP tests on saliva samples (excluding the integrated EasyCoV system), French Haute Autorité de Santé, November 27, 2020

[4] Rapid review of SARS-CoV-2 antigen detection tests, French Haute Autorité de Santé, October 8, 2020

[5] Butler-Laporte G et al. Comparison of Saliva and Nasopharyngeal Swab Nucleic Acid Amplification Testing for Detection of SARS-CoV-2: A Systematic Review and Meta-analysis. JAMA Intern Med, 2021: e208876.