Coronavirus – Evaluation of the use of saliva samples as an alternative to sampling via a deep nasal swab to detect SARS-CoV-2, the virus that causes COVID-19.

Because of the benefits to both patients and healthcare professionals, a study on the use of saliva samples as an alternative to sampling via a deep nasal swab (nasopharyngeal) to detect SARS-CoV-2 using molecular detection tests (PCR) was launched on 28 May 2020.

Study
This study was commissioned by the federal task force "testing & shortages" and approved by the Medical Ethics Commission of the UZ Leuven. Several partners of the national testing platform participated in this study: the national reference center for respiratory pathogens, companies, universities, and the Belgian military. The study was supported by Sciensano and the FAMHP.

Purpose of the study
In comparison with classic sampling via a nasal swab, collecting a saliva sample is easier, not invasive and not unpleasant for the patient. Thanks to these user-friendly aspects, the use of saliva samples can be an advantage, for example, during a SARS-CoV-2 outbreak in a school where children need to be tested. There is also less risk for healthcare professionals when taking a saliva sample because patients can take it themselves and there is less risk of coughing or sneezing than when taking a sample with a swab.

Previous studies have shown that saliva samples can be used to detect other respiratory pathogens. However, it **is not yet clear how sensitive SARS-CoV-2 detection is in saliva samples in different populations and during the infection cycle when compared to sampling through the nose**. This study compares both types of sampling.

Study set-up
Two saliva samples alongside a classic nasopharyngeal sample were taken from more than **2000 people** from triage centers. The saliva samples were collected using two different methods: via a saliva swab and with a simple saliva receptacle. All samples were analyzed by two separate private laboratories. The RNA extraction protocol used, the RT-qPCR platform and the PCR target genes were different for each lab.

Results of the study

1. Results obtained from the two laboratories were highly concordant and therefore are independent of the analytical methodologies used.
2. The sensitivity of the saliva (spitting) receptacle was markedly better than the saliva swabbing device
3. For people with a low viral load (< 20 000 copies/ml nasopharyngeal transport medium), the correspondence between nasopharyngeal and saliva samples is extremely low (less than 5%). This means that people with a low viral load are not detected using saliva samples.
4. For people with a medium to high viral load, the correspondence between nasopharyngeal and saliva samples is high (up to 97% correspondence), and this is mainly the case with saliva samples taken with the saliva receptacle.

More details and the full results of the study will be published at a later stage.

Conclusion
Saliva samples are thus less sensitive than nasopharyngeal samples to detect the presence of the SARS-CoV-2 RNA. In practice, subjects with a low viral RNA load are detected via a

conventional nasopharyngeal swab, but not with saliva. In contrast, the correspondence with the nasopharyngeal test results was satisfactory for subjects with medium to high viral RNA loads that probably also correlate with the early active phase of infection and the risk of shedding of infectious virus in the environment.

For the reasons above, saliva testing is not suitable for individual diagnosis of COVID-19 virus in symptomatic patients and high-risk contacts. However, saliva sampling is likely to have value to identify asymptomatic individuals with medium to high viral load in the context of systematic screening campaigns.