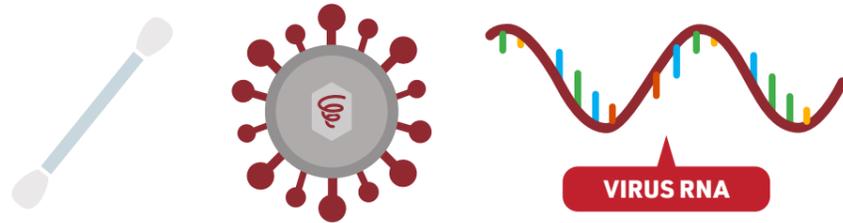


# HOW DO THE TESTS FOR CORONAVIRUS WORK?

## HOW CURRENT TESTS WORK

1

A swab is taken of the inside of a patient's nose or the back of their throat. This sample is then sent to a lab to test.



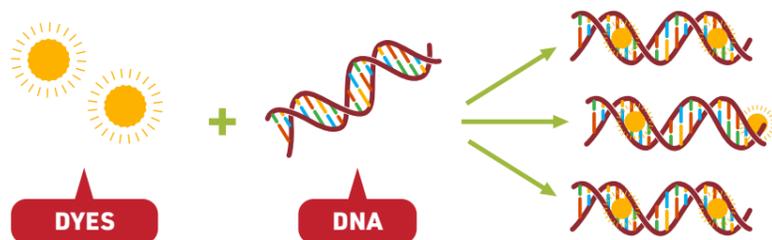
2

The RNA of the virus is extracted and purified. An enzyme, reverse transcriptase, converts the RNA to DNA.



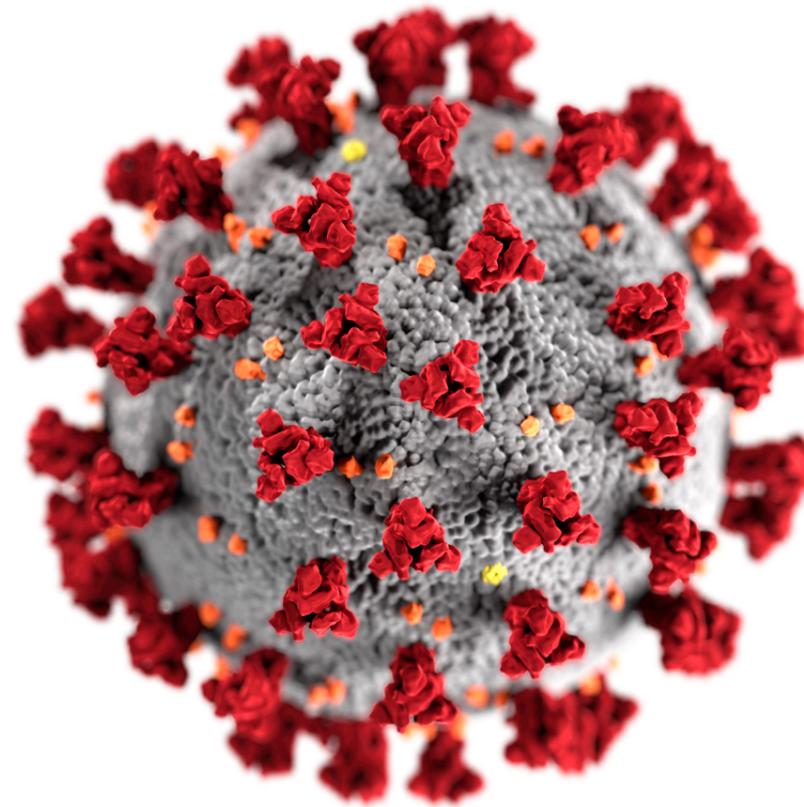
3

The DNA is mixed with primers, sections of DNA designed to bind to characteristic parts of the virus DNA. Repeatedly heating then cooling DNA with these primers and a DNA-building enzyme makes millions of copies of virus DNA.



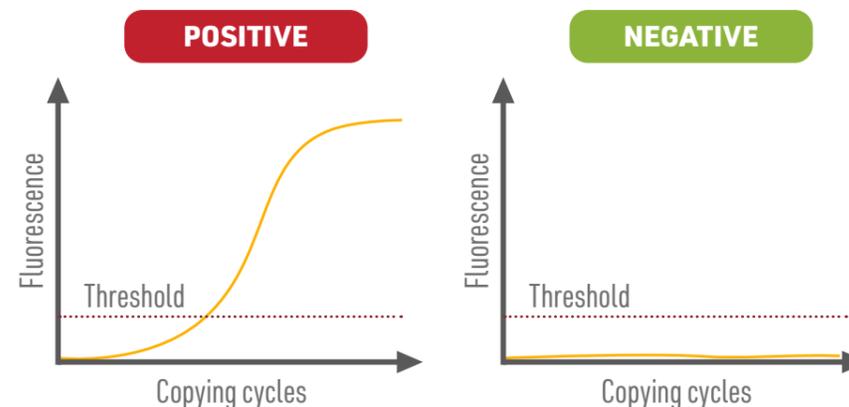
4

Fluorescent dye molecules bind to the virus DNA as it is copied. Binding makes them give off more light, which is used to confirm the presence of the virus in the sample.

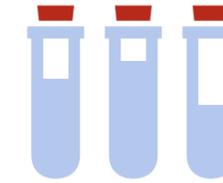


## POSITIVE AND NEGATIVE TESTS

The fluorescence increases as more copies of the virus DNA are produced. If it crosses a certain threshold, the test is positive. If the virus isn't present, no DNA copies are made and the threshold isn't reached. In this case, the test is negative.



## ISSUES WITH TESTING



### REAGENT ISSUES

High demand and issues with reagents have delayed testing in some countries.



### TIME-CONSUMING

It takes a few hours to get results from the test, limiting how many tests can be done.

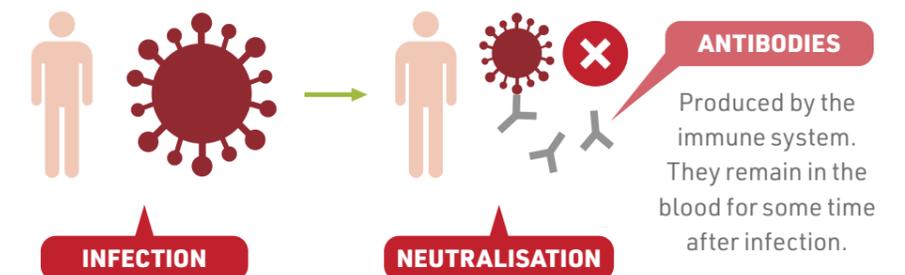


### FALSE POSITIVES AND NEGATIVES

In some cases sample degradation or contamination can affect the results.

## FUTURE TESTS

The current tests are good for diagnosing an infection – but they can't tell us if someone has had it and then recovered. Tests that look for antibodies against the virus can do this.



Tests that look for proteins on the surface of the virus are also in development. These tests are faster, but less accurate.

