

Lab-on-a-chip test for coronavirus

A rapid, low-cost, chip-based testing kit to detect coronavirus uses polymerase chain reaction (PCR) – a method of amplifying small amounts of genetic material – and a fluorescent marker to identify the virus

1. Virus sits low in oesophagus and lungs. Handheld kits collect virus's genetic RNA

Sterile swab used to collect cells from nose or throat

2. Trace nucleic acids from swab first mixed with amplification reagents

3. Mixture is injected into microfluidic chip and centrifuged at high speed to mix RNA and reagents

Portable nucleic acid analyzer

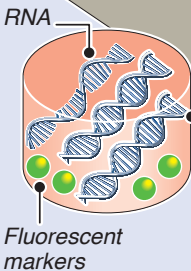
Microfluidic chip

Test cells

4. Microfluidic chip placed into analyzer. RNA fragments are amplified into cDNA*

5. Test cells: Markers bind to region of cDNA which identifies specific pathogen

6. Marker emits fluorescent signal when excited by blue light



*Complementary DNA synthesized from single-stranded RNA

Testing frustrated by lack of kits (proportion of population tested)



0.49%

South Korea

Pop. 51.5 million

Tested **250,000**



0.25%

Italy

60.5 million

150,000



0.08%

United Kingdom

66.4 million

50,000



0.01%

United States

327.2 million

32,000

RESULT SUMMARY	
	Adenovirus F40/41 Astrovirus
✓	SARS-CoV-2
	Norovirus GI/GII Rotavirus A
	Sapovirus (I, II, IV, and V)