COVID-19

## COVID-19 diagnostic tests are done using the qPCR technique

qPCR (often referred to as PCR) is a technique to identify pathogens (bacteria, viruses, fungi) and other diseases by looking for known DNA (or RNA) sequences in samples.

It is the only method for reliably identifying COVID-19 and so is used in all reliable test kits (including those supplied by the USA's CDC, UK's PHE and other government agencies).

How do COVID-19 tests (CDC etc) work?

1. Sample arrives at the lab.
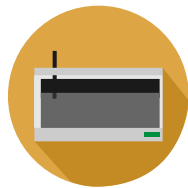
2. An 'Extraction' machine cleans the sample and extracts any DNA/RNA.

3. qPCR thermocycler amplifies any COVID-19 RNA present in the sample.

4. Thermocycler output analysed by specialists to determine if COVID-19 detected.

5. Results sent back to hospital/ doctor/patient.

pcr.ai (by diagnostics.ai) analyses qPCR data automatically, removing the need for specialists and ensuring standardisation, accuracy and quality-control.*

Current limitations of testing by qPCR

SPECIALISTS REQUIRED TO ANALYSE DATA
- Lower throughput.
- Cannot run tests without specialists.
- Higher costs.
- Lengthy test time.

LACK OF STANDARDISATION
- Same patient can get a different result.
- Difficult to track diseases between labs and nationally.

pcr.ai by diagnostics.ai
Proven and reliable accuracy.*
Proven time and resource savings.*
Built-in standardisation of results.
Inherent tracking capabilities.

MANUAL ANALYSIS ALLOWS ERRORS
- Inaccurate tests lead to medical errors.
- False positives have high impact (contact tracing, increased workload for medical staff).
- False negatives have high impact (patient spreads disease).

NO REAL-TIME TRACKING
- Reporting to central authority by phone or email is slow and can be error prone.
- Current pen-and-paper based reporting methods can lead to delays.

*22,200 test prospective clinical study by NHS Glasgow A.R. MacLean, R. Gunson (Nov 2019)
Automation and standardisation of clinical molecular testing using PCR.Ai – A comparative performance study Journal of Clinical Virology, Volume 120

## diagnostics.ai work on Covid-19 and related pathogens to date

Automated the analysis of more than a quarter of a million tests including various strains of the Corona virus (which was also included in the clinical study referenced).

- **King's College Hospital** NHS London, UK using pcr.ai for managing the resulting process and overseeing the quality control checks. Once sufficient patient data has been gathered to train the algorithm (enough positive results, coming weeks), pcr.ai will enable complete automation for Covid-19 testing. This will enable them to meet forecast demand of **doubling** the number of samples tested per day without additional staffing needs - whilst maintaining efficiency and standards for these and other patient testing needs.
- One of the largest patient (CLIA) testing labs in the USA are pcr.ai clients and are also expecting sample intake (demand) to shortly **double** as a result of Covid-19 testing. In the coming weeks they will begin using pcr.ai, this will enable them to meet demand and maintain standards.

Uses of AI for help detect and combat Covid-19

Use-case	Details
Increased throughput for central laboratories	UK plans to test 10,000 patients per day and for other countries this is even higher – meaning increased efficiency is urgently required to meet need and labs increasingly will struggle.
Aid small labs & clinics to run PCR tests	Help testing happen nearer to near-patient using standard off-the-shelf equipment combined with pcr.ai to allow testing without hiring specialists, enabling samples to be tested nearer doctors and patients.

Covid-19 tracking
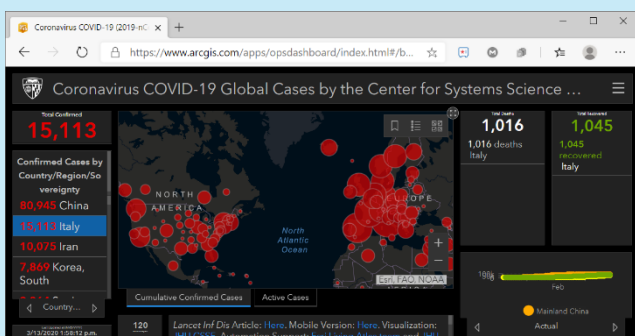
Current tools for tracking:

1. Are manually updated and involve time delays
2. Are only available at a country-by-country level in most cases

By providing data to such tools (subject to data-privacy considerations etc) pcr.ai in-built tracking capabilities will allow hospitals, governments and patients to track incidences by area with standardised accurate test results.