

# **RADT Vs RT-PCR**

# Why in News

Recently, New Delhi's <u>Covid-19</u> testing strategy has become controversial due to **the low level** of **RT-PCR** (Reverse Transcription Polymerase Chain Reaction) **re-testing in persons** tested negative in **RADT** (Rapid Antigen Detection Tests).

Using RADT widely without following up with adequate retests contradicts <u>Indian Council of Medical Research</u> (ICMR) guidelines on use of the RADT test.

# **Key Points**

### ICMR Guidelines:

- RADT ought to be used only in containment zones, hotspots, hospital settings and laboratories among those who manifested one or other symptoms of the disease, influenza-like illnesses.
- People with comorbidities who were asymptomatic and high-risk contacts of those confirmed positive.
- Those who tested 'negative' and whom clinicians suspected to be harbouring the
  disease ought to be definitely tested sequentially by RT-PCR to rule out infection and
  higher chances of false negatives.
- Those who test positive don't need a re-test and must be considered positive.

### Testing in New Delhi:

- From 18<sup>th</sup> June 16<sup>th</sup> July, it has conducted 3,05,820 RADT. Of these, 2,85,225 tests came 'negative' and out of them only, 1,670 were chosen for re-test by RT-PCR and 262 of these were confirmed positive.
- Only 1 in 200 of those who tested negative in an antigen test to detect possible coronavirus cases were re-tested, which is against the given guidelines of ICMR.
- Of those re-tested with RT-PCR, around 15% tested positive, which is higher than the RADT positive results i.e. 6%.

## Arguments for Low Re-tests:

- Re-testing everyone would defeat the purpose of having another (rapid antigen) test.
- The RT-PCR test takes a minimum of 2-5 hours including the time taken for sample transportation. This **limits the widespread use of the test** and also impedes quick augmentation of testing capacity in various containment zones and hospital settings.
  - In RADT, the maximum duration for interpreting a positive or negative test is 30 minutes, thus a guicker complement to the standard RT-PCR tests.

## Arguments Against:

- The consequence of indiscriminately deploying antigen tests would mean expanding the number of tests and presenting a lower positivity rate while not necessarily being able to reliably establish the extent of the spread of the coronavirus in the population.
- A low level of re-testing with RT-PCR in persons who are testing antigen negative will

### underestimate the cases and make the tracking inaccurate.

### **RADT**

- It is a test on swabbed nasal samples that detects antigens (foreign substances that induce an immune response in the body) that are found on or within the SARS-CoV-2 virus.
- It is a point-of-care test, performed outside the conventional laboratory setting, and is used to quickly obtain a diagnostic result.
- Like RT-PCR, the rapid antigen detection test too seeks to detect the virus rather than the antibodies produced by the body.
  - While the mechanism is different, the most significant difference between the two is time.
  - As the ICMR has pointed out, the **RT-PCR** test takes a minimum of **2-5 hours** including the time taken for sample transportation..
  - In a reliable **rapid antigen detection test,** the maximum duration for interpreting a positive or negative test is **30 minutes.**

### **RT-PCR Test**

- Kary Mullis, the American biochemist invented the PCR technique. He was awarded the Nobel Prize for Chemistry in 1993.
- Under this, copies of a segment of DNA (deoxyribonucleic acid) are created using an enzyme called Polymerase.
  - The 'chain reaction' signifies how the DNA fragments are copied, exponentially one is copied into two, the two are copied into four, and so on.
- A fluorescent DNA binding dye called the "probe" is added to DNA, which shows the presence of the virus on a <u>fluorometer.</u>
- However, coronavirus is made of RNA (ribonucleic acid).
- Therefore to detect coronavirus, RNA is converted into DNA using a technique called reverse transcription.
  - A 'reverse transcriptase' enzyme converts the RNA into DNA.
- Copies of the DNA are then made and amplified.

**Source: TH** 

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