



## **Types of COVID-19 testing in Thailand**

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### **ABSTRACT**

In this situation, many countries-including Thailand, encounter COVID-19, so scientists try to develop COVID-19 testing and vaccines.

Presently in Thailand contains three methods for COVID-19 testing viz Real-time RT-PCR, Rapid test, and RT-LAMP. After searching for information, we can summarize the difference of their ways - detection, sampling, time, clinic value, and price. In discovery, Real-time RT-PCR and RT-LAMP are material genetic virus detection. The Rapid test is immunity detection. In sampling, Real-time RT-PCR and RT-LAMP utilize throat swab or nasopharyngeal swab. The rapid test uses collecting blood/serum/plasma. Rapid test is the fastest and cheapest testing, and Real-time RT-PCR is the highest specification.

Moreover, it is the first one that the WHO (World Health Organization) recommends to other countries to utilize it. Still, it is the most costly and takes a long period for testing. On the other hand, the rapid result is a Rapid test; however, it can be wrong if the patient's body does not produce antibodies (early infected).

### **Objective**

The purpose is to compare how different of Covid-19 testing in each types.

**Keywords:** COVID-19; Real-Time RT PCR; Rapid Test; RT-LAMP

### **INTRODUCTION**

Nowadays, many countries are in danger because of coronavirus disease ) 2019COVID -(19, and the number of infected people went up continuously, for example, in Thailand, only one place is the super spreader because this virus can spread from person to person by small droplets. Hence, it makes people worried about whether they are infected or not, but they did not go to testing because the cost of COVID-

19testing is costly. But now the price is lower than the early because of the collaboration of scientists, doctors, and researchers to develop technology, so we

have various ways of testing. At this moment, Thailand has three types of COVID- 19testing: Real-time RT PCR, Rapid test, and RT-LAMP. Thus, little people know about these tests and how they work; to not confuse each class, we are going to show you how different of them.

### **METHODS**

#### **1). Real-time RT-PCR**

Principle: Real-time RT PCR is a nuclear-derived method that can detect the presence of specific

genetic material from any pathogen. This method uses individual markers - fluorescent dyes to distinguish SARS-CoV-2 so scientists can follow the results instantly (IAEA, 2020)

Sampling: COVID-19 can swab from

1. Your mouth and throat (oropharyngeal)
2. The middle of your nostrils (nasal mid-turbinate)
3. The front of your nostrils (anterior nares)

If you have a cough with mucus, called a “wet” or “productive” cough, your doctor might want to test some of what you can cough up (WebMD, 2020).

Merit: real time RT PCR is highly specific and sensitive, takes 3-5 hours to evaluate, can detect even if it has few viruses. Whatever it is live or dead virus real time RT PCR can distinguish it from the upper respiratory tract's secretions, but this testing should be careful about contamination in the environment

Price: start from 76.96 USD (Bangkokbiznews, 2020)

## 2). Rapid test

Rapid test has two types

1. antigen detection
2. immunity detection

But most in Thailand is immunity SARS-CoV-2 detection. Its limitation is the time because the body takes time to make immunity when the body receives the antigen

Principle: Rapid test detects the COVID-19 immunity (IgM and IgG) through blood and manipulates

detection to show the result. IgM will make when patients had symptoms five days ago, and IgG will make when patients had symptoms ten days ago. Typically, the antibody will make when a new antigen comes to the body and takes time to produce immunity. If it has few viruses, maybe it will show a negative result, so it should be utilized in the person who received the illness in 5-10 days . and interpretation is a risk to the spread of germs, so it must be interpreted by medical laboratory scientists only. (Department of Medical Sciences, 2020)

Sampling: collecting blood/serum/plasma sample (Oxford Biosystems, 2020)

Merit: The result can be read in 15 minutes by eyes, and it is inexpensive.

Price: 6.16 - 15.39 USD (Bangkokbiznews, 2020)

.3Reverse Transcription Loop-mediated Isothermal Amplification (RT-LAMP )

Principle: RT-LAMP is an increase of material genetic virus by reaction in constant temperature. The sensitivity is close to the RT-PCR technique. But RT-LAMP can be more accessible and faster. It can show the result in one hour (Chulalongkorn University, 2020)

Sampling: patient's secretions

Merit: RT-LAMP is easier and faster than RT-PCR. It shows the result in one hour and can be read by naked eyes.

Price: start from 12.25USD (pacific science, 2020)

|                  | Real time RT-PCR                   | Rapid Test                    | RT-LAMP                            |
|------------------|------------------------------------|-------------------------------|------------------------------------|
| <b>detection</b> | material genetic virus detection   | Immunity detection            | material genetic virus detection   |
| <b>sampling</b>  | throat swab or nasopharyngeal swab | collecting blood/serum/plasma | throat swab or nasopharyngeal swab |

|                       |                               |                    |                                     |
|-----------------------|-------------------------------|--------------------|-------------------------------------|
| <b>clinical value</b> | highly specific and sensitive | hardly to diagnose | normally specific, easy to diagnose |
| <b>time</b>           | 3-5 hours                     | 15 minutes         | 1 hour                              |
| <b>price (USD)</b>    | 76.96                         | 6.16-15.39         | 25.12                               |

**Table 1: The differences between the three methods****REFERENCES**

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