

Polymerase Chain Reaction (PCR) Laboratory Update

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The setup of a specialist laboratory that will significantly improve Cook Islands' COVID-19 testing capabilities is nearing completion.

The reverse-transcription polymerase chain reaction (RT-PCR) test is the gold standard for COVID-19 testing worldwide.

Effective PCR testing requires a dedicated laboratory fitted out with specialised equipment and supplies, not all of which is normally kept on hand by health ministry Te Marae Ora, so certain items have had to be sourced and delivered from Australia, Fiji and New Zealand.

Although Te Marae Ora has had the ability to test for COVID-19 in-country since May 2020, the ministry has been working towards setting up a PCR lab for several months now.

“Securing a PCR laboratory in-country will be significant in helping us lift our testing capability for COVID-19,” says Acting Health Secretary Bob Williams.

Currently, in-country COVID-19 tests carried out in the Cook Islands are conducted using a cartridge-based GeneXpert machine. Te Marae Ora currently has sufficient supplies to conduct approximately 9000 GeneXpert tests in-country.

Alternatively, DNA specimens collected via throat or nasal swab are sent to New Zealand for testing, a process which usually takes about a week and costs approximately \$100 per test.

Having our own PCR lab will provide the Cook Islands with a more cost-effective means of testing for COVID-19. Budgeted at \$900,000 – including a laboratory information software system – the dedicated lab will also enable Te Marae Ora to conduct up to 1200 tests per day if required.

At present the actual room in which the lab will be housed has been fitted out ready for the new equipment to be installed. The PCR machine itself has already arrived, as well as various chemical reagents and other equipment necessary for the PCR testing process.

Te Marae Ora is still waiting for the next half of the shipment, which includes other essential items such as biosafety fridges and a centrifuge.

Once everything has arrived, the equipment will be set up by two local biomedical technicians with virtual online assistance from the international development organisation Pacific Community (SPC).

Hospital staff working with the new equipment will require further training in its use, which SPC also plans to carry out online. The New Zealand government may provide some training assistance as well.

A standard PCR test has three steps – first, a DNA sample swab is placed into a vial containing a medium that any virus present migrates into. Chemical reagents are then used to extract the viral DNA. Finally, any viral genetic material is amplified and then detected using a reverse-transcription polymerase chain reaction.

“The PCR lab is a specialised laboratory focussed on testing for certain diseases using genetic technology,” explains Te Marae Ora laboratory manager Douglas Tou. “Thanks to that technology we can more efficiently and effectively test for diseases like COVID-19 – as well as influenza and other viruses like dengue.”

Te Marae Ora would like to acknowledge funding for the PCR lab which came from SPC and the New Zealand Ministry of Foreign Affairs and Trade and the efforts of former Health Secretary Dr Josephine Aumea Herman, under her watch setting up an in-country PCR lab was initiated. WHO and UNICEF have assisted greatly with the supply of the genexpert cartridges.

Likewise, the support of the Cook Islands government has been critical, without this support this project would not have been possible.

When complete the PCR lab will complement earlier investments in infrastructure aimed at supporting the Cook Islands’ ability to respond to any potential cases of COVID-19.

Midway through last year Rarotonga Hospital was also equipped with two negative pressure rooms that can be used to treat critically ill COVID-19 patients, as well as a host of other potentially fatal infectious illnesses.

The PCR lab is expected to be up and running by the end of February.

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