

## The First Wave of SARS-Cov-2 in Sri Lanka - A Perspective of a Clinical Virologist

Saranga Sumathipala

Teaching Hospital, Anuradhapura, Sri Lanka

Correspondence: Saranga Sumathipala  
Teaching Hospital, Anuradhapura, Sri Lanka  
E mail: [g\\_sumathipala@yahoo.com](mailto:g_sumathipala@yahoo.com)

 ORCID ID: <https://orcid.org/0000-0002-1085-7505>

### INTRODUCTION

SARS-CoV-2 caught the world by surprise when it started to spread globally with news of healthcare systems being overwhelmed by the continuous influx of patients and reports of high death rates. Although Sri Lanka did not enter the phase of community spread (by the time of writing of this article), the COVID-19 pandemic was a test of the adaptability of the Sri Lankan healthcare system rather than a test of endurance.

The Sri Lankan healthcare system relies heavily on the government sector which is responsible for providing universal care for all citizens. This system comprises a central administration which oversees a hierarchy of healthcare institutes from large tertiary care facilities to smaller units. It is to the government sector that patients would go or be directed to, for serious infections or infections of major concern. Because of this, the bulk of the workload involved in handling the COVID-19 pandemic was and is done by the tributaries of Sri Lankan Ministry of Health (MoH).

### DIAGNOSTICS

The first case of COVID-19 which was exported out of China was reported on 13<sup>th</sup> January 2020 in Thailand. This hinted to other countries that they should brace for the impact of a pandemic. In Sri Lanka initial interest was focused on achieving diagnostic capability for this virus which had no established diagnostics available at the time. The choice of test was straightforward, a real-time RT-PCR assay, the standard direct virus detection method for a clinical virology laboratory. With this method,

any given virus in a sample can be detected with high sensitivity and specificity and a large number of samples could be processed at within a reasonable timeframe of hours to achieve a diagnostic result. At the Ministry of Health, the primary virology laboratory was at the Medical Research Institute (MRI), Borella while there were three regional virology laboratories already established at National Hospital (NH)-Kandy, Teaching Hospital (TH)-Karapitiya and TH-Anuradhapura capable of performing a diagnostic PCR on the fly. The major challenge at this stage was to obtain a diagnostic assay. There were no commercially produced assays at this point of time. The MRI was fortunate to obtain a batch of PCR reagents from University of Hong Kong (HKU), courtesy of Prof. Malik Peiris, which were instrumental in diagnosing the very first COVID-19 patients in Sri Lanka. While this was based on a test protocol from HKU, the other three laboratories were also able to obtain reagents from multiple sources. The most used assay in the early days, the Centre for Disease Control (CDC) USA protocol reagents were supplied by a private company which boldly undertook the responsibility of supplying reagents to these labs. At this time other laboratories such as the Centre for Dengue Research at the University of Sri Jayewardenepura, were also keenly helping the Ministry of Health in SARS-CoV-2 detection as the requirements for diagnostics were increasing. By the time of the composition of this article, diagnostics had expanded to multiple laboratories at MoH, university laboratories and private laboratories while the diagnostic process was centrally coordinated via the MoH.

The laboratory testing process was not smooth as the supply chain was variable due to both the episodic availability of reagents, consumables and

equipment at a time of a high global demand as well as due to logistic issues due to lock downs and airport shutdowns. As of this time the specific SARS-CoV-2 PCR testing capacity has risen to more than 1500 per day in Sri Lanka from an initial number of hundreds. Apart from these problems, the main challenge was the availability of trained human resources for the laboratories. The bulk of the PCR testing is done manually. At MoH and other institutions it was done by trained medical laboratory technologists and in some universities, it was done by research students. Shortages of human resources including medically trained Consultant Virologists to oversee the diagnostic process is a primary concern in the country. At present there is an interest to automate at least a part of these PCR laboratory processes to increase efficiency. Allied testing modalities such as looking for SARS-CoV-2 specific antibodies are also currently being explored.

### **THE CLINICAL ENVIRONMENT**

The hospitals and allied clinical environments receive numerous patients throughout the day and these include many patients with infectious diseases. SARS-CoV-2 being a virus capable of transmission via respiratory route and being a hazard group 3 pathogen, poses a specific challenge on the infection control practices of a healthcare system. Although there has been a constant effort attempting to increase the infection control standards of our healthcare systems over the years, this virus became the true enforcer of practices upon the healthcare workers and patients. The entire workflow in most institutions had to be changed to accommodate potential SARS-CoV-2 infected patients while preventing or minimizing the risk of transmission of the virus to healthcare workers and other patients. Many protocols and policies were specifically developed at institutional level and national level, a major step forward in Infection Prevention and Control practice in Sri Lanka. The clinical virology/microbiology teams were the most taxed in the beginning since the perception of the threat was minimal to most. Later, however, when reports of SARS-CoV-2 cases in Sri Lanka started to increase significantly, more serious attention towards this virus was given by all parties.

There was a reduction in hospital admissions of patients partly due to the curfew in the country to limit the movement and contact between the citizens and to limit infection transmission. This eased the

burden on the hospitals enabling health care workers and institutions to prepare for COVID-19 cases. It was a difficult task for healthcare workers to engage in the management of suspected and confirmed SARS-CoV-2 infected patients while they were in full personal protective equipment (PPE) in a tropical climate. The biggest barrier in patient care was and remains the limitations of availability of PPE such as standard N95 respirators, which are in severely short supply globally. This has led institutions to adapt many strategies for extended use and re-use of certain PPE which were once single-use-disposable items.

The fears about the virus instilled by the COVID-19 'info-demic' may have led to incidents of involuntary delays in attending a suspected COVID-19 patient. Access to accurate information, rather than exaggerated news, and clear instructions and training targeting both health care personnel as well as the general public is highlighted as vitally important during these situations. Most routine clinical work such as routine surgeries were delayed due to attempts to minimize the of risk exposure to healthcare staff. However due to successful containment of the virus in the country by public health and quarantine measures, while preventing sustained community transmission, the fearful perception about the virus is gradually reducing among healthcare staff as well as rest of the citizens. Normal routines are gradually being resumed.

### **FUTURE WORK AND PREPAREDNESS FOR THE NEXT WAVE / NEXT PANDEMIC**

Where diagnostics were concerned, the most acutely felt deficiency was non-availability of reagents and consumables. To mitigate these shortages, certain consumables like swabs for sample collection were locally manufactured by Sri Lanka Institute of Nanotechnology (SLINTEC) while its complement of viral transport media (VTM) was produced in-house at the MRI. Although Sri Lanka at its current stage cannot achieve full self-sufficiency in terms of the molecular reagents and consumables, it would be worthwhile to explore possibility of local production whenever possible within Sri Lanka, especially in the context of global shortages where less is shared with countries like ours.

Initially the laboratory infrastructure for PCR diagnostics was inadequate but currently the numbers have gone up with rapid development and deployment of laboratories for SARS-CoV-2

detection. This laboratory network could be developed and streamlined further to face future waves of COVID-19 and other infections. Additionally, a major deficiency in Sri Lankan virological diagnostics are non-availability of proper reference facilities which includes Biosafety Level (BSL-3) labs and sequencing facilities. It would be prudent if proper reference facilities are developed soon either as a standalone system or as an official network which include relevant scientific entities in the country. A collaborative network would be a better option especially when research and development is also considered for integration.

Where the clinical environment is concerned, there is lot to be developed in terms of infrastructure, especially giving attention to infection control practices. Hospital isolation units capable of handling high level pathogens are a future necessity. All departments including intensive care facilities will need to handle high risk patients to save their lives. The PPE shortages are best addressed through local manufacturing lines since Sri Lanka already has high standards in apparel manufacturing. Alternate PPE options such as Powered Air Purifying Respirators (PAPRs) could be a better investment when the need arises for handling of high-risk patients confidently in critical environments.

For both laboratory and clinical environments, recruitment and training of more staff of all relevant categories would be a good decision especially when a second wave of the disease should be anticipated.

Currently most of the SARS-CoV-2 positives in the country are asymptomatic cases who rarely need genuine medical intervention, and therefore the true COVID-19 cases are kept well under the curve. The current strategy remains testing, contact tracing and isolation. The outcome would be different if this virus gains momentum to infect complication-susceptible groups such as the elderly in Sri Lanka. In such a scenario the diagnostic and clinical management approaches may change in the country to accommodate a high case number and to minimize mortality while case number reduction is attempted through community-based control methods.

In conclusion, early lessons from the current crisis include the need for an established nation-wide laboratory infrastructure, manned and supervised by trained personnel that has the capability and tools to respond the new threats within a period of days to weeks when necessary. The need to increase local production of high-grade molecular consumables,

suitable for export if necessary, PPE and other equipment that may be needed for future epidemics of potentially more infectious or virulent organisms is highlighted. We must also strengthen hospital infection prevention and improve staff awareness and training in relation to handling infectious patients before the next wave or the next epidemic hits.