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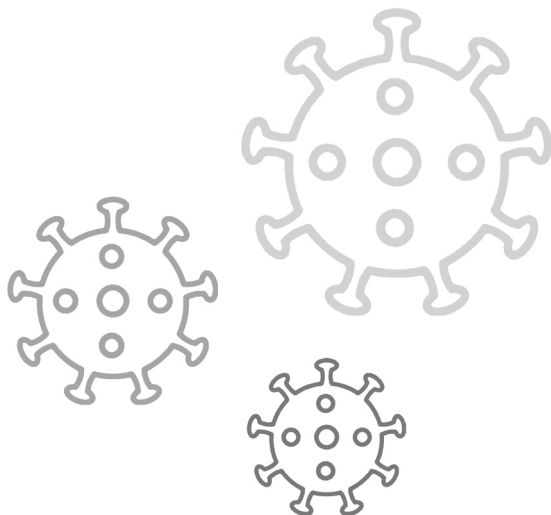
2021

PMAC 2021 |  
**COVID-19**

Advancing Towards

an Equitable and Healthy World ○○○

28 JANUARY – 2 FEBRUARY 2021, BANGKOK, THAILAND



PMAC 2021  
**COVID-19**



Advancing Towards

an Equitable and Healthy World



The companion book  
for field trips

in PMAC 2021



PMAC | PRINCE MAHIDOL  
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# COVID-19

Advancing Towards

an Equitable and Healthy World



*The companion book for field trips in PMAC 2021*

# PMAC 2021 | COVID-19: Advancing Towards an Equitable and Healthy World

The companion book for field trips in PMAC 2021

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**ADVISOR** Virasakdi Chongsuvivatwong, PhD, MD

**EDITORS** Jadej Thammatacharee, PhD, MD  
Kamolrat Turner, PhD, RN  
Sorachai Jamniandamrongkarn, BSc (Pharm)

**AUTHORS** Kamolrat Turner, PhD, RN  
Panarut Wisawatapnimit, PhD, RN  
Sukjai Charoensuk, PhD, RN

**REVIEWER** Paul Alexander Turner, PhD

**COORDINATORS** Wilailuk Wisasa, MEcon, BSc  
Suwaporn Marsook, BHI MSc.  
Atcharaporn Thammachot, MPH, BA  
Shota Takemura, BSc

**PRINTER** Sahamitr Printing & Publishing Co, Ltd.,  
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## Preface

### Thailand's Universal Health Coverage and it's adaptability to combat COVID-19

National Health Security Office

Thailand's policy on Universal Health Coverage (UHC) has made progress since its inception in 2002. Every Thai citizen is now entitled to essential health services at all life stages. The benefits of the policy comprise essential services in preventive, curative, and palliative care for all age groups. Extension of coverage to high-cost services, such as renal replacement therapy, cancer therapy, and stem-cell transplants, has improved financial protection for patients. Well-coordinated district health systems enable individuals to seek care or referral at health units close to home. The resultant increase in service utilization has contributed to a low prevalence of unmet needs for outpatient and inpatient services.

Thailand was the first country outside China where COVID-19 was first reported in the country on 13 January 2020. The Ministry of Public Health (MoPH), Thailand reported the first imported case of lab-confirmed novel coronavirus (2019-nCoV) from Wuhan, Hubei Province, China. However since the first detected case reported in Thailand, the relevant stakeholders managed to keep the pandemic under control. The three keys to getting the outbreak under control consist of quick detection, quick

medication and personal protection. Our implementation stem from a combination of public health measures, social measures and universal health coverage or UHC.

Public health measures include active surveillance, screening and tracing, treatment, assessment of COVID-19 patients. We screen the arriving passengers, after the country was closed we still strictly screening at border checkpoints and in communities, the people with symptom /risk history/contact also the vulnerable population who can be the risk group such as prisoner, homeless etc. We have also equipped our health facilities with necessary medical personnel, equipment and supplies. Thailand prepare ICU, non –ICU bed, negative pressure unit, N95 face masks, sets of PPE and ventilators, sufficient stocks of drugs, field hospital, hospitel, etc. The health care workers had been well-trained and committed to monitor the management of COVID-19 cases including diagnosis and treatment.

Social measures include certain restrictions of movement, lock down, effective communication and awareness-raising campaigns. The important campaign is personal hygienic practices, universal wearing masks, washing hands regularly and promote social distancing. Fabric face mask use was universal concern in community supported by local Community Health Fund which is matching fund from National Health Security Office (NHSO) and Local government. Another social measure was increasing allowance for vulnerable groups, such as the poor, the workers effected from lock down or COVID-19, also general group to boost the economic status.

The UHC measure contributes strengthening the healthcare system, by making it more resilient and more responsive. It is also key to enhancing global health security. The UHC made a more significant success stems from a combination of public health and social measures, including active surveillance and screening, state and local quarantines, effective communication, enhanced social safety nets, and awareness-raising campaigns based on these three Principles - Equity, Efficiency, and Participation.

**Equity:** Everyone in Thailand will be able to access the COVID-19 related health services both for Thais or foreigners. COVID-19 related health services assessment among the vulnerable group is not the primary issue in Thailand since the UHC is the key to provide a timely response to health emergencies and allow Thai citizens access to COVID-19 related health services, including free active screening and surveillance, testing, tracing, quarantine and treating.

#### UHC related COVID-19 in Thailand



**Efficiency:** The NHSO continues to improve the COVID-19 management and mobilize resources fit to the situation such as 1) the UHC budget was allocated to cover the costs of testing, tracing, treatment, and additional compensation for health workers, 2) the new technology and social innovation play an essential role, such as telemedicine, line application in the rural area for social distancing during the pandemic, 3) big data helps identify the source of disease and trace the people contracting to the confirmed cases. Health investment in affordable pharmaceutical products, medical supplies, and equipment ensures they are available to deal with any possible re-emergence of the pandemic.

**Participation:** People's participation is an essential key issue. The Community Health Fund supports health programs tailored to each locality's needs with involvement and decision-making by local communities. The fund has been used to procure face masks and hand sanitizers as well as support Village Health Volunteers. The collaboration on multi-stakeholders and civil society participation innovation delivers drugs and medical supplies to patients by the Drug store, Post office, and Health Volunteer. Patients can reduce time and travel expenses while reducing risk getting from hospitals. Therefore, during the COVID-19 pandemic, Village Health Volunteers had been our “unsung heroes”. Their crucial role ranges from monitoring people's movement, conducting house visits and check-ups, disseminating information reporting to the public health authorities.

The pandemic had created the “New Normal” and prompts us to improve our UHC Scheme. We see the urgent need to involve new technology and social innovation in improving UHC. The necessity of social distancing

had made clear the potential virtual care such as telemedicine, Line application in the rural area during the pandemic. We aim to increase the ratio of telemedicine services from 1 to 5% by next year. We will continue to promote partnership with multi-stakeholders and civil society groups on participations innovation in service delivery, such as sending medicines out by post and Health Volunteer, and also allowing patients to pick up their medicines at local pharmacies.

COVID-19 had proved the value of a long-term investment in Universal Health Coverage (UHC) and health systems, manned by well-trained and committed health workers.

The PMAC 2021 field trips has been organized virtually under the theme “COVID-19: Advancing Towards an Equitable and Healthy World.” It will share Thailand’s experience in the fight against COVID-19 and how National Universal Health Coverage has played an important role in ensuring that our people continue to have access to medical and health services during this challenging time. The field trips will cover the following issues:

- The combination of public health measures, social measures and universal health coverage that Thailand implemented to fight COVID-19
- Who played an important role in our fight against COVID-19 and how?
- What aspects of the health system were particularly agile and adaptable to combat an outbreak effectively (e.g. health volunteer programme, social participation and partnerships)?

- A “New Normal” that the pandemic will usher in, and prompt us to improve our UHC

The synopses of 4 site visits proposed for virtual PMAC 2021 are as follows:

### **1). Wisdom and Innovation against COVID-19: Mahidol University**

The outbreak of coronavirus disease (COVID-19) now continues to spread and expose the severest of challenges for the first time in our history of the planet. While tremendous information about the virus is exponentially unfolded, we do materialize that it is transmitted through close direct contact with an infected individual's respiratory droplets. Now, research and learning from multi-sectoral partners are mobilizing around a call for prioritizing medical management in response to COVID-19. Until there is a vaccine, curative therapy, or eradication for COVID-19, there is no better cure than early detection, surveillance, and prevention.

COVID-19 unveiled a lack of well-equipped capacity to handle such a health crisis and the lack of sustained preparedness, especially in the health sector. Still, this offers opportunities for each country and experts to combine disruptive technologies and imaginative innovation using collaboration from healthcare team networks and create efficient mechanisms to handle the COVID-19 burden.

Mahidol University is the leading academic university in Thailand and Asia that decided to step up and provide strong advocative collaboration among faculties. Notwithstanding where they work, none of them would leave a patient in need. Uncertainty has awakened survival instincts in the mindset, going from radical thinking of

limited resource management to empowering individuals to take responsibilities and build trust. Everything that can be done to constrain this disaster is being called into action under the wisdom and verified evidence. Responses focus on governance, prevention, early detection, and control of COVID-19 in various circumstances and people with different walks of life. Mahidol University and all sectors display an indispensable role in immediate responses and building a "new normal" once the crisis has passed. Some innovations include Cas13-based diagnostic kits LAMP PCR, service care in vulnerable populations, robotics, and a drive-through blood test to deal with the challenge of social distancing. We transparently deliver accurate information. Offering consistent and rational messaging based on medical recommendations accessible to everyone will ensure that civilians nationally and internationally will understand the threat and up-to-date advancement to act accordingly. COVID-19 is not the first and will not be the last epidemic that we will encounter. The crisis lets us ensure that this is not a missed opportunity to accomplish the vision of Mahidol University of preparedness for future threats.

## **2). Integrative and Seamless Management to Tackle COVID-19 at the Border Area of Thailand: Sadao District, Songkhla Province**

Since COVID-19 had started to spread worldwide, the Thai border areas kept an eye on how to manage the situation effectively. Sadao is a district in Songkhla Province, located in the south at the border between Malaysia and Thailand. One third of the population are Muslim. There are three border checkpoints in Songkhla province. Sadao – Bukit Kayu Hitam border checkpoint is the most important checkpoint with the highest border trade value.

In 2018 there were about in-and-out 500,000 tourists, 450,000 cargo trucks, and 476,000 private cars and buses crossing this border. Thus, Sadao District is a vulnerable place to spread COVID-19 due to its high frequency of people movement and cross-border transportation.

In this field trip, lessons learned about COVID-19 management strategies to three challenging events which occurred at Sadao District will be shared, including 1) how to reduce fear among people in the community and stigma attached to COVID-19, 2) how to prevent and control COVID-19 outbreak at the Sadao Customs Checkpoint and how to manage temporary quarantine facilities, and 3) how to deal with the situation of the infection among the immigration police officers and the detainees at the Songkhla Immigration Detention Center (IDC), leading to the establishment of the field hospital at this center.

### **3). Community Immunity without Vaccines: Nan Province Experience**

People around the world are waiting for the vaccine to immunize against COVID-19, which is still a far dream for people in remote areas. However, Nan residents have created their way of living as immunity to tackle COVID-19 even though Nan has various ethnic groups, including Hmong, Khamu, Thin, Mien, and Mlabri. Thailand has been recognized as one of the best countries in COVID-19 management. Based on the Joint Intra-Action Review of the Public Health Response to COVID-19 in Thailand by WHO, risk communication and community engagement are the components of one of the nine pillars of the national response driving the country successful. A strong engagement of people in the community in response to the pandemic works as an immunity to save the community



from the disease. Nan is one of a few provinces in Thailand where there is no report of COVID-19 infection. Rapid responses with good cooperation from all stakeholders in the community have been practiced such as 14-days of local quarantine, screening of risk groups, wearing masks in public and social distancing regulation. Community rules based on their culture have been mutually set to prevent COVID-19 by people in the community. Public communication about the disease and how to be safe raised people awareness and compliance with the rules. Community leaders and village health volunteers are significant persons to run all these activities with partial financial support from the community fund. The success in Nan Province not only succeeded in preventing COVID-19, but also can help ease villagers' economic problem caused by COVID-19. Nan's economy is based mainly on agriculture. Fertile land with good irrigation supported by the Royal Initiative Project has been opened for villagers to grow vegetables in an organic way. These organic vegetables could not be sold as usual when the country has been locked down due to the pandemic. The sufficiency economy philosophy that is deeply planted in the community helps them to overcome the challenge. The villagers harvest those vegetables for their food and share them with neighbors. The bond of people in the community based on the sufficiency economy philosophy leads people to live their lives in a simple and self-reliant way. They share and help each other, especially the vulnerable groups with compassionate love. The elderly of various ethnic groups usually earn income from selling the embroidery of their indigenous costumes to tourists. Since the pandemic, no tourists come to the community. The village heads help these elderly sell their embroidered

indigenous costumes online instead of onsite. “Leave no one behind” reflects a strong community engagement that play an important role as immunity of the community. In the virtual site visit, participants will learn from Nan’s experience of strong community engagement to tackle COVID-19 and how they live their lives by the sufficiency economy philosophy.

#### **4). The Synergy of Public and Private Sectors to Tackle COVID-19 and Revitalize Phuket Towards Sustainable Medical and Wellness Tourism**

Phuket, “The Pearl of the Andaman”, is a prime destination of Thai and overseas tourists for its spectacular scenery, world recognized magnificent beaches, eco-adventure and typical culture. Prior to 2020, over 10 million tourists visited Phuket each year. With an international airport, Phuket is an important hub of economic activity, having an annual income over 470,000 million THB (16,000 million USD) mainly derived from tourism.

Dealing with the COVID-19 pandemic, like many other countries, Thailand has introduced strategic measures for controlling the contagious situation as quickly as possible for the benefit of the population. The management to control COVID-19 in Phuket was extremely challenging as there were a large number of tourists from all over the world during the peak time of infection. Nevertheless, with the synergy of public organizations, the private sector, and communities, along with the experience of Phuket in dealing with the past emerging infectious diseases such as SARS and MERS, Phuket was able to control the outbreak of COVID-19 within a couple of months. The strategies that lead to this success include factors such as a super lockdown measure, lockdown at a district level and vil-

lage level in some areas, collaboration of all sectors for screening, local quarantine supported by the hotel industry, and establishment of a field hospital which had the highest number of beds in the country for COVID-19 patients.

It can be said that in the fighting match with COVID-19 “Phuket is the winner”. However, there is no war that creates no damage. The hotel and tourism industry, the main business of Phuket, had to close down and laid off their staff. This has had impact on the household income chain. It is a big challenge to revitalize Phuket and recover its economy, while also dealing with the situation of COVID-19 outbreak worldwide. With the synergy of all sectors, Phuket has been able to efficiently manage for controlling the outbreak as well as make Phuket a medical and wellness tourism city. Tourism is ready to be reopened and welcome tourists with a special tourist visa (STV), alternative yacht quarantine (AYQ), alternative state quarantine (ASQ), and alternative local quarantine (ALQ). Welcome all to Phuket and please believe that it is a safe haven.

***The case studies of four site visits are described in the next consecutive chapters:***

# 1

# Wisdom and Innovation against COVID-19: Mahidol University

Panarut Wisawatapnimit  
Kamolrat Turner  
Sukjai Charoensuk

## Wisdom and Innovation against COVID-19: Mahidol University

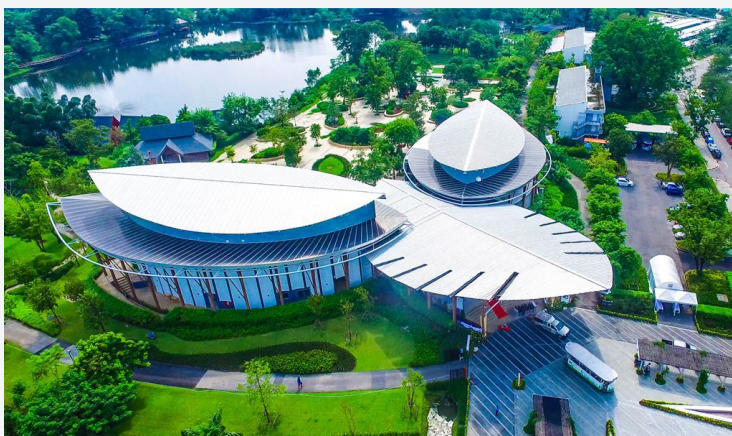
Panarut Wisawatapnimit  
Kamolrat Turner  
Sukjai Charoensuk

### Introduction

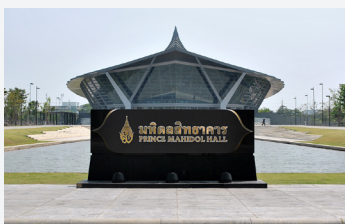
During the COVID-19 outbreak in Thailand, academic institutes have played important roles to help the country respond to this crisis. Mahidol University (MU) is one of the leading universities in Thailand involved with COVID-19 management. The involvements in COVID-19 management of six MU faculties, including Faculty of Medicine Siriraj Hospital, Faculty of Medicine Ramathibodi Hospital, Faculty of Tropical Medicine, Faculty of Medical Technology, Faculty of Engineering, and Faculty of Public Health are represented to demonstrate how the academic institute can help the nation to tackle COVID-19.

### Mahidol University at a Glance

Mahidol University has its origins in the establishment of Siriraj Hospital in 1888 by His Majesty King Chulalongkorn (Rama V), and the hospital's medical school is the oldest institution of higher learning in Thailand, granting its first medical degree in 1893. Later becoming the "University of Medical Sciences" in 1943, Mahidol University



*Mahidol University*



*Prince Mahidol Hall,  
Mahidol University*

was renamed with great honor in 1969 by H.M. King Bhumibol Adulyadej (Rama IX), after his Royal Father, H.R.H Prince Mahidol of Songkla, who is widely known as the ‘Father of Modern Medicine and Public Health

in Thailand’.<sup>1</sup>

Mahidol University has since developed into one of the most prestigious universities in Thailand, internationally known and recognized for the high caliber of

research and teaching by its faculty, and its outstanding achievements in teaching, research, international academic collaboration and professional services. This diversified institution now offers top quality programs in numerous social and cultural disciplines, including the most doctoral programs of any institution in Thailand, yet has maintained its traditional excellence in medicine and the sciences.<sup>1</sup>

There are a total of 629 programs offered from 17 faculties, 6 colleges, 9 research institutions and 6 campuses in MU, 3 campuses are located in Bangkok, another 3 are located in different provinces outside Bangkok, and there are also 5 university hospitals for providing services and training. Based on the MU annual report in 2019, MU was ranked first among all universities in Thailand, the 81<sup>th</sup> in Asia, and the 522<sup>nd</sup> in the world, as cited in the U.S. News Best Global Universities Ranking.<sup>2</sup>

During the COVID-19 outbreak in March 2020, MU has corroborated its determination statement “Wisdom of the Land” by integrating academic knowledge, research, and innovations, to lead the policies and practice to help Thailand fight with COVID-19.

### **Mahidol University’s Involvement in Thailand’s Strategies to Tackle COVID-19**



*Prime Minister  
leading the  
Centre for  
COVID-19 Situation  
Administration*



*Meetings of involved sectors leading by Prime Minister to fight with COVID-19*

*COVID-19 situation report to public by CCSA*

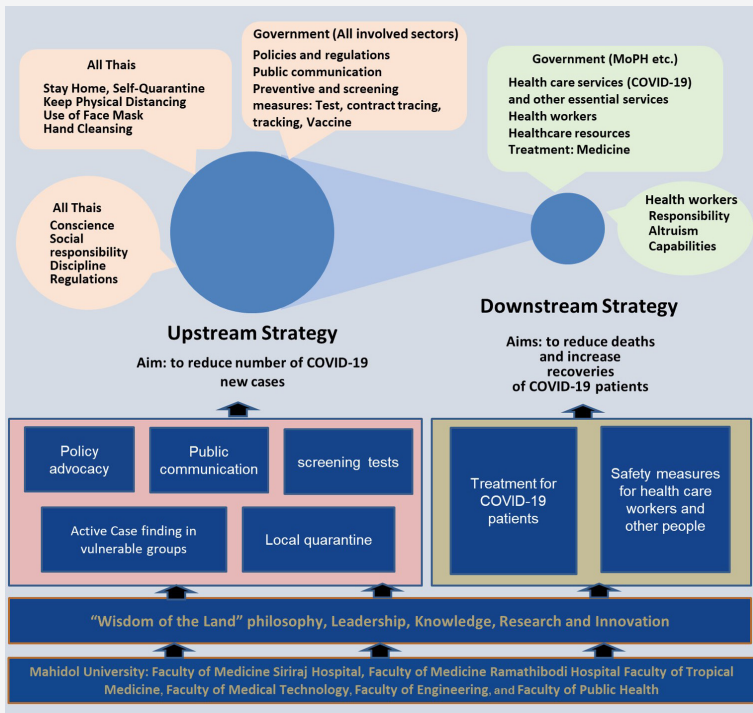


Since the end of December 2019, when China reported the first case of pneumonia-like symptoms with a suspected novel virus, the Thai Ministry of Public Health (MoPH) and academic institutes, including MU have alerted about this new disease. The first case of COVID-19 in Thailand was reported on 12 January 2020 and the outbreak in the country was announced in March



2020, due to the spread of SARS-CoV-2 from a boxing stadium and a night club. The Centre for COVID-19 Situation Administration (CCSA) was established for national COVID-19 management and chaired by the Prime Minister, General Prayuth Chan-Ocha, with collaboration among leading partners and key stakeholders.

MU has involved in the national strategies developed to tackle with the outbreak and can be described in two streams, namely upstream and downstream strategies as shown in Figure 1.



**Figure 1** Mahidol University’s Involvement in National Strategies to Tackle COVID-19  
(modified from Prof. Dr. Prasit Wattanapa’s slide)

The upstream strategy aims to reduce the number of new COVID-19 cases with five components: Policy advocacy; Public communication; Screening test; Active case finding; and Local quarantine (Figure 1).

The downstream strategy aims to reduce mortality rate and to increase recoveries of COVID-19 patients using medications and treatments following guidelines. Safety of healthcare workers and staff involved in COVID-19 are also strongly emphasized. (Figure 1).

### **Mahidol University's Involvement in Upstream Strategy to Tackle COVID-19**

For the upstream strategy, MU administrators and staff have been involved in all five components as follows:

**Policy advocacy:** At the peak time of the COVID-19 outbreak in March 2020, MU staff had forecasted trends of new COVID-19 cases and deaths based on the epidemiological approach that the number of new cases and deaths would grow exponentially if the control measures did not operate effectively. This information was used as evidence for developing policies to manage the outbreak.

The Deans of Medical Faculties of MU, epidemiology team, and other universities had presented the evidence and raised their concern about the trend in the number of COVID-19 cases to the Prime Minister, Deputy of Prime Minister, and the Ministry of Public Health. Consequently, Bangkok was announced to be locked down on 21 March 2020 and the National Emergency Decree was authorized on 26 March 2020. The lockdown measure was released in May 2020 when the number of new COVID-19 cases reduced and became zero on 13 May 2020.

The Dean of Faculty of Medicine Siriraj Hospital, Prof. Dr. Prasit Watanapa, M.D., also proposed Thailand to use “the Hammer and the Dance Strategies.”<sup>3,4</sup> The Hammer is a suppressive strategy for quickly mitigating the number of new COVID-19 cases by using aggressive regulations, such as a nationwide lockdown and state quarantine for people travelling back from abroad for at least 14 days. When the number of new cases is under control, the Dance strategy is implemented.<sup>4</sup> During the Dance phase, the restrictions in the Hammer phase are relieved in stepwise manner and with close monitoring. When there is a sign of new outbreak, the Hammer strategy must be re-applied.

The Staff of the Faculty of Medicine Ramathibodi Hospital worked collaboratively with the staff of the Department of Diseases Control to develop a mathematical model of COVID-19 and used to provide options for decision making. The model helped the authorities to formulate evidence-based regulations such as strictly controlling some activities in certain periods. It is also useful for resource allocation.

When Thailand had faced a new COVID outbreak starting in December 2020, MU administrators also played a vital part as policy advocacy to manage this outbreak.

**Public communication.** Timely and correct public communication about COVID-19 is important to reduce rumors and misinformation as well as increase awareness among the people. Since January 2020, MU staff have started to organize academic meeting for presenting and discussing this emerging disease. MU Administrators, such as the Dean of Faculty of Medicine Siriraj Hospital,



*Prof. Dr. Prasit Watanapa providing COVID-19 knowledge and situation to public*



*Prof. Piyamitr Sritara presenting a COVID-19 screening kit to public*

Prof. Dr. Prasit Watanapa, M.D., and Dean of Faculty of Medicine Ramathibodi Hospital, Prof. Piyamitr Sritara, M.D., have continuingly provided up-to-date knowledge and the current situation regarding COVID-19 to public. Advanced knowledge, research and innovations, and preventive measures, are also presented to the public via various channels, such as MU channel and social media. This approach has raised awareness and compliance among most Thais to follow the government's preventive regulations, such as wearing masks, cleaning hands, keeping physical distancing, and staying home. It has also helped reduce the number of new cases admitted to hospitals.

The Faculty of Engineering has also developed artificial intelligence (AI) to screen fake news about COVID-19 on social media and to provide correct information from reliable sources. This can reduce rumors and fake news on the internet.

**COVID-19 screening test.** Availability and specificity of SARS-CoV-2 screening tests were a challenge in Thailand, especially during the first period of the outbreak when the number of suspected COVID-19 cases increased. With a high capacity of virology laboratories and staff of MU, COVID-19 screening techniques and toolkits were further developed to detect SARS-CoV-2 genes. A virology laboratory of the Faculty of Medicine Ramathibodi Hospital could examine SARS-CoV-2 genetic coding and its antigen using Reverse Transcriptase-Polymerase Chain Reaction (RT-PCR) technique by nasopharyngeal swab since the end of January 2020. Then, a virology laboratory to detect SARS-CoV-2 was set up in February 2020.

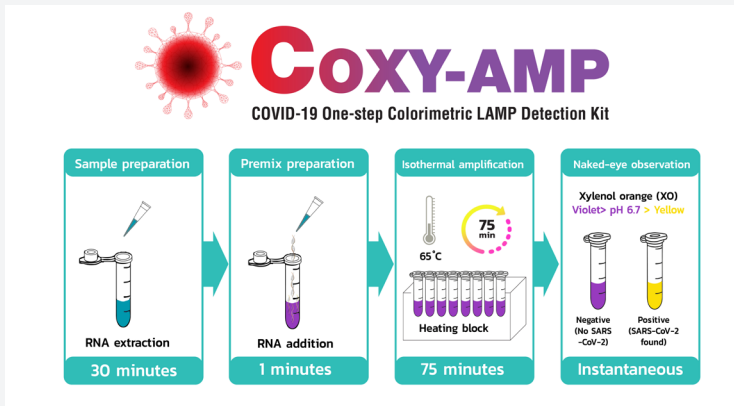
The methods of Magnetic-Beads RNA Extraction and Loop-mediated isothermal amplification (LAMP) were also developed by National Center for Genetic Engineering and Biotechnology (BIOTEC), National Science and Technology Development Agency in collaboration with the Faculty of Tropical Medicine, Mahidol University. Currently, the validation has been completed for further approval from the Department of Medical Sciences and Food and Drug Administration (FDA) Thailand in February 2021. Happily, the methods of Magnetic-Beads RNA Extraction and LAMP extract RNA of COVID-19 using only cheap domestic reagent. These techniques are 100% specificity, 92% sensitivity and 97% accuracy. The results can be observed easily by color change; yellow is positive and purple is negative. It can be used widely in health care facilities that have limited access to the central laboratories and can reduce spending of the country's budget.



Heat box for LAMP test



Magnetic-Beads RNA Extraction and LAMP test



RT-PCR for detecting SARS-CoV-2 genes with an additional housekeeping gene test has been used at a virology laboratory of the Faculty of Medical Technology. This housekeeping gene test is beneficial to avoid false negative results due to inadequate specimens and ensure true negative results of SARS-CoV-2 by confirmed virus RNA in nasopharyngeal specimen and housekeeping gene in human cells.



*Diagnostic testing of COVID-19 via Real time RT-PCR*

A study about sero-surveillance by testing neutralizing antibodies (IgM, IgG) was also conducted by the Faculty of Medical Technology (led by Professor Dr. Pilaipan Puthavathana and Dr. Hatairat Lerdsamran) in collaboration with the Department of Disease Control, Ministry of Public Health. The study results can guide the direction of treatment and the preventive measures. If SARS-CoV-2 is not detected and the neutralizing antibody is positive, this patient can be discharged. The result of this technique is also implied to estimate the infection rate and the size of the outbreak in the epidemiological study; that is useful to estimate the severity of the next outbreak that may occur.

Specimen collection methods were also studied by the Faculty of Medicine Ramathibodi Hospital. Saliva specimens were compared with nasopharyngeal swabs. Collecting saliva for testing reduces irritation and saves the collector from contacting the virus better than using nasopharyngeal swab.<sup>5</sup> It was found that the saliva test was 80% accurate with 84.2% sensitivity, 98.9 % specificity, and 97.5 % relevance. Therefore, saliva specimen collection can be alternative sample collection methods in a large group of people such as people in a community as a preliminary test. If the results are positive, the nasopharyngeal swab will be used for confirmation.



Currently, these screening techniques and tool-kits have been used widely in Thailand, so the number of suspected people who are able to access the tests is increasing.

**Active case finding in vulnerable groups.** Vulnerable people, including homeless people, vagrants and prisoners are at high risk for SARS-CoV-2 infection, but at the early time, these groups were still far from



*Active case finding in vulnerable groups*



*Active case finding in vulnerable groups leading by Dr. Sakchai Kanjanawatana, Secretary-General of the NHSO (in the middle), Dr. Athaporn Limpanyalers, Deputy Secretary-General of the NHSO (the second person from the left) and Prof. Dr. Chartchalerm Isarankura-Na-Ayudhya, Dean of the Faculty of Medical Technology (the second person from the right)*



reaching. To serve a national policy to screen COVID-19 in high risk groups, the Dean of the Faculty of Medical Technology, Prof. Dr. Chartchalerm Isarankura-Na-Ayudhya has collaborated with Dr. Sakchai Kanjanawatana, Secretary-General of the National Health Security Office (NHSO) and other networks to proactively screen for COVID-19 infection. More than 7,000 homeless people and prisoners in Bangkok and neighboring provinces were screened. The findings revealed that the governmental policy is very effective to control the spread of the virus in vulnerable groups.

**Local quarantine.** The Faculty of Public Health had collaborated with local authorities and Sung Noen Hospital to develop a local quarantine system in communities and



*Health Literacy Promoting Center for Emerging Diseases  
leading by Assoc. Prof. Dr. Chanuantong Tanasugarn,  
Dean of Faculty of Public Health  
(the first person of the front row from the left)*



*Local quarantine  
at Sung Noen  
District*

provide knowledge about COVID-19 and social determinants of health to help people using a holistic approach. The Faculty of Public Health had offered a building at Sung Noen District, Nakhon Ratchasima Province for local quarantine. A Health Literacy Promoting Center for Emerging Diseases was also established for COVID-19 prevention and preparation for the next health crisis. Community engagement and peer support previously used to empower the village health volunteers and non-communicable disease (NCD) patients were employed to transfer COVID-19 knowledge and preventive guidelines to people in communities.

### **Mahidol University's Involvement in Downstream Strategy to Tackle COVID-19**

For the involvement with advanced treatments and high technologies, four MU hospitals, including Siriraj Hospital, Ramathibodi Hospital, Chakri Naruebodindra Medical Institute and Hospital for Tropical Diseases have actively provided treatment to reduce the number of COVID-19 deaths and to increase patients' recoveries.

Administrators of MU hospitals had been alerted and prepared to respond to COVID-19 since January 2020. The war rooms in each hospital were set for meetings to monitor the COVID-19 situation and to update guidelines of treatments.

Acute respiratory infection (ARI) clinics had been arranged in these 4 hospitals with full medical devices and monitoring systems to provide one stop service, COVID-19 cohort wards for moderate symptom patients, and intensive care units for severe symptom patients. Additional



*Acute respiratory infection clinic*



*Respiratory care unit  
for COVID-19 patients*



*Negative pressure  
room for screening test  
of COVID-19 patients*

negative pressure rooms to control virus transmission had been installed. A communication channel in patients' rooms was established, such as video call and camera to reduce close contact.

Robotics for providing services in a hospital had been developed by the Faculty of Engineering and other institutes for reducing close contact with COVID-19 patients in wards, such as DoctoSight Robot for drug logistics and other deliveries, Foodies Robot for delivering medications and foods to patients' rooms, and Westies Robot for collecting infectious wastes.



*DoctoSight Robot*



*Westies Robot*



*Assoc. Prof. Dr. Jackrit  
Suthakorn, Dean of  
Faculty of Engineering  
and DoctoSight Robot*

The Faculty of Medicine Ramathibodi Hospital, the Faculty of Sciences and Excellent Center for Drug Discovery, and Thailand Center of Excellence for Life Sciences also put their efforts to examining the effect of many kinds of herbs on the SARS-CoV-2 virus, and found that the experimental result of *Boesenbergia rotunda* crude extract in the laboratory was satisfactory, so further clinical trials are in process.

Mobilizing surge capacity of health care workers has been suitably managed to reduce stress among the workers and increase the quality of care. For the safety of MU's health care workers, infection control training programs have been set to review and increase their knowledge. Positive pressure rooms have been installed to protect specimen collectors.

PPE shortage was an important issue during the outbreak in March 2020. MU administrators solved this problem to ensure enough PPEs for their health care providers by sterilizing the PPEs with UV-C or 70 degrees Celsius of dry heat for 30 minutes to be reused. The Faculty of Medical Technology involved with Government Pharmaceutical Organization (GPO) and other partners in manufacturing PPEs to help the country overcome the problem of PPE shortage. This Faculty was also involved with the development of the standard of powered air purifying respirator with a helmet or a hood for medical and health care personnel.



*Powered air purifying respirator (PAPR) quality testing*

To distribute COVID-19 medicines, PPEs, and essential medical devices nationwide, medical resource allocation system has been developed using AI, called SmartMedSupply, by the Faculty of Engineering to effectively allocate medical resources during the COVID-19 outbreak.

AI-Immunizer has been started to develop by collaboration between the Faculty of Engineering and Center for Vaccine Development, Institutes of Molecular Biosciences, MU to enhance the potential of Thai vaccine



*AI-Immunizer*

development. This robot is able to perform a comprehensive test of human neutralization immunity. It has a traceability system with digital information and machine vision system, and the AI software for processing images of immunity test results. Therefore, it helps reduce the infection risk of vaccine developers, increase faster pace of vaccine development, and solves the problem of lacking specialists in vaccine development.

Chatbot called Jubjai Bot has been developed by the researchers of the Faculty of Engineering to detect depression of people during the COVID-19 situation. This chatbot can screen mental health status of people by using standard questionnaires and also be able to chat with users to reduce stress and depression.

To maintain other essential health services for non-COVID-19 patients, telemedicine has been used for routinely visiting patients. Medicine are ordered by physicians using a computerized physician order entry (CPOE) system and be delivered to patients' houses by mail to reduce close contact and the crowds at MU hospitals.



*Telemedicine*

With downstream strategy, MU can help cure COVID-19 patients and provide academic knowledge and advanced technologies to be beneficial for both patients and health care workers.



## Key Success Factors

The determination of MU administrators and staff, strong leadership, and very good collaboration with all partners are key success factors for MU to tackle with COVID-19.

MU has a strong inspiration to follow a philosophy of HRH Prince Mahidol of Songkla stated that “True success is not in the learning, but in its application to the benefit of mankind.” Thus, administrators and staff have a determined philosophy of their work to be the “wisdom of the land.” This determination raises high efforts of MU staff to tackle COVID-19 for the country by using their strengths in academic knowledge, research and innovation.

Strong leadership and vision of the Chairman of MU Council and former Minister of MoPH, Clinical Prof. Emeritus Piyasakol Sakolsatayadorn; President of MU, Prof. Banchong Mahaisavariya; and all Deans of faculties are the success keys for MU to advocate national policies and communicate with the public in this health crisis.



*Prof. Banchong Mahaisavariya,  
President of MU*



*Clinical Prof. Emeritus  
Piyasakol Sakolsatayadorn,  
Chairman of MU Council*





*Asst. Prof. Weerapong Phumratanaprapin, Dean of Faculty of Tropical Medicine; Assoc. Prof. Dr. Chanuantong Tanasugarn, Dean of Faculty of Public Health; Prof. Dr. Prasit Watanapa, Dean of Faculty of Medicine Siriraj Hospital; Prof. Dr. Piyamitr Sritara, Dean of Faculty of Medicine Ramathibodi Hospital; Prof. Dr. Chartchalerm Isarankura-Na-Ayudhya, Dean of Faculty of Medical Technology; Assoc. Prof. Dr. Jackrit Suthakorn, Dean of Faculty of Engineering*

Research and Innovation are main focused of MU. Therefore, during COVID-19 outbreak, MU staff can extend their knowledge and networks to conduct their new research and develop innovations to help country and health care facilities tackle and manage COVID-19 issues effectively and timely.

Collaboration with all sectors is an important component to manage COVID-19 because it is a novel outbreak that causes high impact to people in the whole country. The synergy and seamless integration of all involved sectors is needed to produce updated knowledge and develop timely innovations.

## Acknowledgement

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# 2

## Integrative and Seamless Management to Tackle COVID-19 at the Border Area of Thailand: Sadao District, Songkhla Province

Panarut Wisawatapnimit  
Kamolrat Turner  
Sukjai Charoensuk

# **Integrative and Seamless Management to Tackle COVID-19 at the Border Area of Thailand: Sadao District, Songkhla Province**

Panarut Wisawatapnimit  
Kamolrat Turner  
Sukjai Charoensuk

## **Introduction**

Sadao District, one of the 16 districts of Songkhla Province, is one of the most challenging places to manage and control the outbreak of COVID-19 because of its nature of being a border town in the south of Thailand close to the north of Malaysia, with a high frequency of people movement. This article aims to present the lessons learned of Sadao District to manage the situation of COVID-19, starting from the first resident with this disease, management at the Sadao Customs Checkpoint, the process of quarantine, and the field hospitals at the Songkhla IDC.

## **Sadao District at a Glance**

Sadao District is over 1,000 kms from Bangkok to the south and its area covers about 858.6 km<sup>2</sup>. In 2019, the total population was 126,626<sup>(1)</sup> of which were 64% Buddhists, 35% Muslims and 1% Christian and others. There are three border checkpoints in Songkhla province. Sadao – Bukit Kayu Hitam border checkpoint is the most important checkpoint because of its highest trade value



*Sadao Customs*



*Sadao – Bukit Kayu Hitam  
border checkpoint*



*Cargo trucks  
crossing Sadao border*

between them. In 2018, there were about 5 million tourists, 450,000 cargo trucks, and 476,000 private cars and buses crossing this border<sup>(2)</sup>. Thus, Sadao District is a vulnerable place for the spread COVID-19 due to its high frequency of people and transport crossing the border.

### **Occurrence of COVID-19 contagion**

As already mentioned, the majority of Sadao residents are Muslim. Some Islamic traditional rituals present a high risk for SARS-CoV-2 transmission. Greeting behaviors such as touching hands, called Salam, participating in activities with many people, such as

praying at a mosque on Friday or travelling abroad for performing an Islamic pilgrimage all result in close contact. Although there are routine procedures for outbreak preparedness, such as Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) at the Custom check-points and hospitals of Sadao District, COVID-19 is a novel



*Muslims praying at a mosque*

disease that is more easily and rapidly transmitted. Therefore, the first case of COVID-19 in Sadao District was a Muslim who was involved with a religious ritual outside the country, and discovered on 29 March 2020. Effective COVID-19 management was rapidly set in April 2020.

The Songkhla Immigration Detention Center (IDC), one of 22 IDCs in Thailand for the detention of migrants who violate Thailand's Immigration Act before sending them to their home country or to the third country, were improved to cope with the pandemic situation. However, with a poor environment and the crowded confinement of detainees, it was unavoidable that some policemen and detainees in this IDC would become infected with SARS-CoV-2 in April 2020.

### **Reduction of fear and stigma by education and community engagement**

Fear of people and stigma of COVID-19 patients occurred from a lack of education and rumors, especially during the first period of the outbreak. Strong leadership

of involved people, educational provision, and community engagement were the key strategies to overcome these negative impacts.

As mentioned above, the first resident of Sadao District with COVID-19 was a 58 years old Thai mullah, or Islamic religious teacher, who travelled back from Pakistan, a country with high rate of infection, and arrived in Bangkok on 29 March 2020. At that time there was no local quarantine. Community leaders (Head of village, religious leaders, village health volunteers and health providers) participated in a community meeting and decided to set a room at a community's mosque to be the location of his quarantine. After quarantining for 3 days, he developed weakness and cough. Finally, his test was positive for SARS-CoV-2 infection and was admitted to Sadao Hospital.

There was a rumor that this mullah had COVID-19 and had spread the infection before his confirmed result. The situation deteriorated when there was another rumor of some people dying from COVID-19 in this village. It affected his wife's career; she could not sell à la carte as usual.

The situation was better because community leaders had educated people in the village about COVID-19 and



*Community meeting*



*"Independence day"  
announcement for the mullah*



promoted protection behaviors for controlling its transmission. These activities helped people in the village better understand this disease and also helped reduce their fear.

With community engagement, after the mullah was discharged from the hospital, he and his wife were welcomed by their community. “Independence day” of him was announced at a community meeting after he finished a 14-day home quarantine. Because of community support, he could live as usual in the village and had become an advocator to teach about Islamic doctrine and COVID-19 protection.

### **Managing COVID-19 Outbreak at the Border by Seamless Integration of All Involved Sectors**

Seamless integration of all involved sectors and strong leadership of provincial leaders were the effective COVID-19 management strategies at the borders.

Governor of Songkhla Province, Mr. Charuwat Kliengklae, had started to plan for controlling this new virus in Songkhla Province since its first transmission in Wuhan China at the end of December 2019. Songkhla airport had strictly screened all passengers for high temperature. The essential material resources for managing this emerging disease were prepared. All hospitals in Songkhla were prepared for admitting patients with capacities for 200 patients.



*Mr. Charuwat  
Kliengklae, Governor  
of Songkhla Province*

Songkhla Emergency Operation Center (EOC) and Com-

municable Diseases Committee under the command of Songkhla Provincial Governor were also alerted to be ready for this outbreak following the regulations and guidelines of national authorities. EOC in all districts had also been operated, including Sadao District under the supervision of Mr. Chavakit Suwankiri, District Chief Officer of Sadao.



*Mr. Chavakit  
Suwankiri, District  
Chief Officer of  
Sadao*

During early March 2020, the number of COVID-19 patients in Thailand and Malaysia increased at a substantially higher rate than the previous month. The Malaysian government issued the 2020 Malaysia Movement Control Order on 18 March 2020. Thailand's Prime Minister General Prayuth Chan-Ocha issued a National Emergency Decree effective from 26 March 2020. This decree had enforced some specific measures necessary to reduce COVID-19 transmission which brought the epidemic under control. Since 7 April 2020, airspace of Thailand had been limited. These regulations stimulated more than a thousand Thais in Malaysia per day to travel back to Thailand. There was chaos, with crowds of people at the checkpoints that could potentially increase virus transmission. The formulated regulations stated that only the Sadao Customs Checkpoint was to be opened for Thais to cross the border back from Malaysia and also allow cargo trucks between two countries, which had been effective since 18 April 2020.

Only 100 Thais per day had been allowed to cross the border. They had to enroll via the website of the Thai Embassy at least two days prior to travel for setting the list

and arranging a travel date to cross 2 checkpoints of each country. A certificate of examination from a physician was needed at the checkpoint. When they arrived at the Sadao Customs Checkpoint, they needed to follow all strict rules and measures to prevent & control COVID-19 as shown in Figure 1.



*Thais cross Sadao Customs Checkpoint back from Malaysia*



*Taking history related to COVID-19*



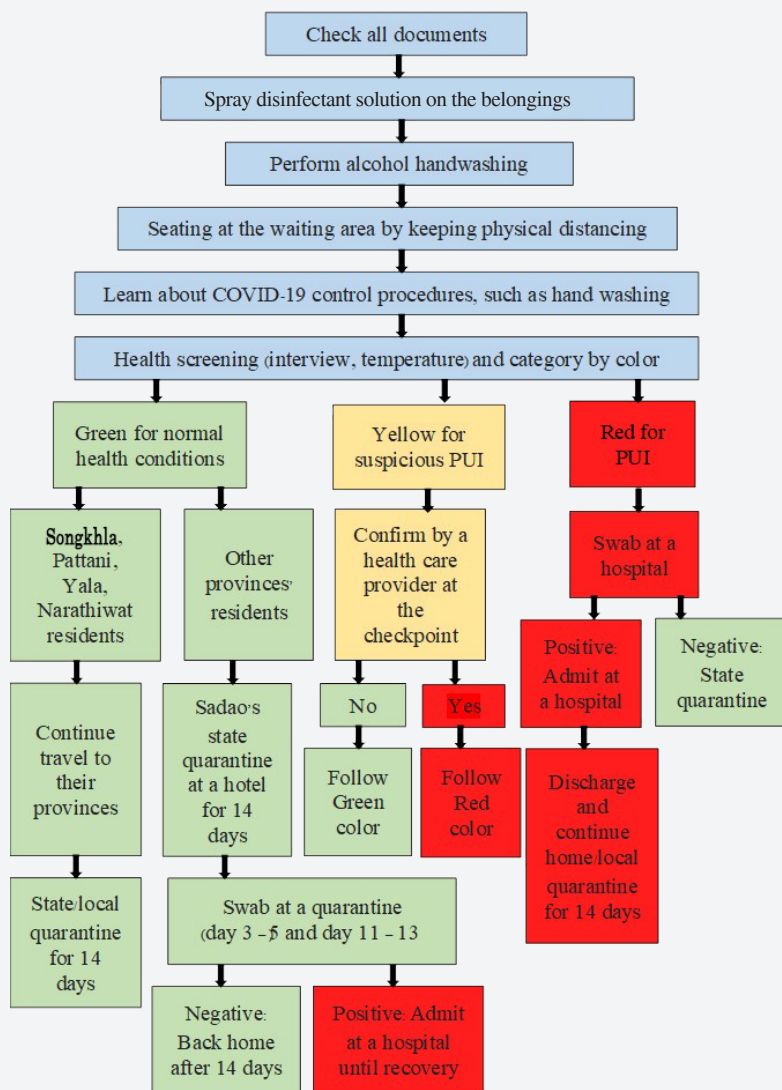
*Teaching hand washing*



*Measuring body temperature*



*Screening patients under investigation*



**Figure 1** Process of COVID-19 Management at Sadao Custom Checkpoint

## Development of effective quarantine model

People crossing the borders from Malaysia, even with a normal health condition, were required to stay at the state quarantine facility for at least 14 days (Figure 1). With limited number of beds in the hospitals, using hotels as a state quarantine was proposed because they had all the resources needed for people to temporarily stay, including staff, room, and services. These hotels also did not have any guests during the outbreak period. To maintain hotels' economics, this was a good alternative opportunity for them.

In the first period, two hotels in Sadao District had volunteered to act as state quarantine facilities. The hotel CEOs had transformed feeling of fear of their staff to be an inspiration that they could help Thailand and Sadao District. Although the hotel staff had full spirit for this duty, knowledge about COVID-19 and strategies to control virus transmission to themselves and others were still needed.



*A hotel quarantine*



*Hotel's staff orientation for people staying at a hotel quarantine*

The online educational training program for hotel staff was developed by Faculty of Nursing, Prince Songkhla University. It included knowledge of COVID-19

and protection measures, such as hand washing, PPE, etc. The hotel staff could consult nursing faculty around the clock.

Director of Sadao Hospital, Dr. Suwat Wiriya-pongsukit, and his team also worked closely with hotel staff. Ventilation, cleaning system, and waste management of the hotels were modified for appropriately controlling the SARS-CoV-2 infection. Physicians and health care providers also came to perform nasopharyngeal swabs of people staying at the hotels on days 3-5 and 11-13.



*Dr. Suwat Wiriya-pongsukit (the second person from the left side) and his team*



*Nasopharyngeal swab*

Currently, the hotels are using a new normal approach to prevent the virus. The hotel staff also are agents of change and are able to be speakers to transfer their knowledge to other hotel staff. The training course was also used to teach airline crews and Songkhla immigration police officers. In December 2020, the number of Thais crossing the border back from Malaysia reduced to 20 – 40 people per day and no PUI (people under investigation) cases were found.

### **Reducing COVID-19 transmission in Songkhla Immigration Detention Center (IDC) by Field Hospital and Humanized Health Care**

There were two main buildings to detain males and females separately. A lot of detainees stayed in the same room. In the past, the environment of the hotels was poor; thus, it was a high-risk place for transmission of the virus.

### **Managing the outbreak at IDC: Field hospital**

On 19 April 2020, a Sadao immigration policeman was infected with COVID-19. A disease investigation team of the Office of Disease Prevention and Control 12, Songkhla Province went to Songkhla IDC to proactively test all immigration officers. It was found that an additional five policemen performing the same duties with the first case had positive results for SARS-CoV-2, so they were immediately admitted to hospital.





*Songkhla Immigration  
Detention Center*



*Field hospital at Songkhla IDC*

Based on the contact tracing process, it was assumed that source of the infection may be from a detainee who was sent to their home country already and was admitted there while carrying the infection. On 23 April 2020, it was found that 42 of 47 detainees staying at the first floor of a building had positive results for SARS-CoV-2. Therefore, the field hospital was established at Songkhla IDC on 27 April 2020 over a three days period by collaboration between a medical team and immigration team.

On 2 May 2020, 18 of 28 detainees staying on the second floor of the building were infected. The second field hospital was set at this floor within three hours, based on experience from the first field hospital.

The field hospitals were established by focusing on 3S: Structure, System, and Staff. For the structure, new ventilation fans were installed. The building and detaining rooms were often cleaned. All necessary medical devices, medicine, and other instruments for detainees, such as mattresses were arranged. For the system, new guidelines focusing on safety of IDC officers and detainees had been





*An Immigration policeman washing hands before working*

developed and authorized to strictly screen signs and symptoms and performed behavior protections, such as measuring temperature, washing hands with 70% alcohol gel, etc. For the staff, all IDC officers were trained about disease prevention and control using online training provided by the Faculty of Nursing, Prince of Songkhla University. The health care providers of Sadao Hospital and Padang Besar Hospital were also rotated to work at this center with immigration officers.

## **Humanized approach for assisting detainees to deal with COVID-19**

The main objectives of the IDC field hospitals were to provide care for all detainees with humanized principles as well as to focus on safety for all medical and immigration staff working in this hospital. The detainees with COVID-19 at the field hospitals received suitable medicine and care following COVID-19 protocols. Those with pneumonia or pregnancy were transferred to the district hospital. All detainees were regularly advised to keep new normal behaviors, such as wearing a mask, washing hands, keeping physical distancing, cleaning their room and maintaining good hygiene.

Health care providers empowered the detainees who can speak Thai to be volunteers in educating other detainees how to behave properly in each situation.

### Key Success Factors

Leadership of administrators in all involved sectors are important, especially the Governor of Songkhla Province, Chief of Songkhla Provincial Health Office and the Director of the Community Hospital. To deal with this difficult situation, it needs transformative leaders with good vision, management, communication, and forecasting ability.



*EOC meeting leading by Governor of Songkhla Province (the second person from the left)*



*EOC meeting with all involved sectors*



*Dr. Utissak Harirattanakul,  
Chief of Songkhla  
Provincial Health Office*

Seamless integration of all involved sectors, both public and private, is also important to tackle COVID-19. Administration, payment, and health systems in national, provincial, district levels are needed to be changed timely. The National Health Security Office also plays important supporting roles, especially financial support and proactive coordination. To prepare for the next wave of COVID-19 or other public health issues, the system of alerting seamless integration approach of all involved sectors is needed.



*Involved sectors to tackle COVID-19*

## Acknowledgement

We would like to extend our deepest gratitude to Mr. Charuwat Kliengklae, Governor of Songkhla Province; Dr. Utissak Harirattanukul, Chief of Songkhla Provincial Health Office; Mr. Chavakit Suwankiri, District Chief Officer of Sadao; Mr. Raschada Jiwalai, Consul General of Royal Thai Consulate-General, Penang, Malaysia; Dr. Suwat Wiriyaongsukit, Director of Sadao Hospital; Mr. Vitoon Chitmanee, Director of Tha Pho Health Promoting Hospital; Mr. Maleekee Taveekul, Tha Pho's Head of Village; and all other informants, including Tha Pho's village health volunteers, and the mullah; staff of NHSO Region 12, Songkhla Immigration Detention Center, Sadao Customs Checkpoint, Prince Songkhla University, and staff of Sadao Hospital.

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# 3

## Community Immunity without Vaccines: Nan Province Experience

Sukjai Charoensuk  
Kamolrat Turner  
Panarut Wisawatapnimit

## Community Immunity without Vaccines: Nan Province Experience

Sukjai Charoensuk  
Kamolrat Turner  
Panarut Wisawatapnimit

### Introduction

Amidst the world pandemic of COVID-19, no one never hopes for vaccine. Instead of sitting and waiting for the effective vaccines from pharmaceutical companies, Nan Province residents have adopted their consensus to adapt new ways of living to prevent the new infection. Strong engagement and cooperation of people in a community can help that very much. This article is aimed to present lessons learned from Nan's efforts to protect their quality of life and economy.

### Nan At a Glance

Nan is one of nine provinces in the northern part of Thailand with population of about 500,000, 10 percents were various ethic groups. Although most people in Nan earn their living by agriculture, their income from agriculture is account only for 14%, comparing to 30% from wages and 20.4% from services<sup>1</sup>. Nan has been well-known as a tourist destination for their rich culture and nature, but their residents had been ranked in the ten poorest groups in the country for a long time until 2017<sup>2</sup>.

Nan's occupation promoting initiative (Nan Model), supported by the Pid Thong Lang Phra\* Institution for Activities Promotion and Development (an initiative under King Rama IX's patronage to assist the poor), was launched in 2009 and implemented in three districts. Ten years of implementation, it has dramatically improved the income of people in these three districts to an average of 5,000 USD per year, which is almost eight times higher than those in other districts (653 USD)<sup>3</sup>. Nan Model is well recognized for its success in eradicating poverty.



*Beautiful nature in Nan Province*

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\*In Thai, means to put the gold leaf at the back of the Buddha Image, imply to anonymous sacrificer



*Fertile land of Nan*

### **Nan Civil Society Against COVID-19**

There are many civil society groups in Nan Province, such as the old town conserving group, the Nan self-reliance group. These groups were alerted to the outbreak of COVID-19 when the government declared the Coronavirus Disease a dangerous communicable disease under the Communicable Disease Act B.E. 2558 on 29 February 2020.

Super spreader events, such as boxing at the boxing stadium in Bangkok, resulted in closing nearly all of business in Bangkok by the government in the mid of March 2020. A lot of people who work in Bangkok were laid off and went home upcountry in the late March. Many of the aforesaid civil society groups who wanted to



protect their province from COVID-19 began gathering to form “Nan Civil Society Against COVID-19” and called the governor on Sunday 24 March for actions to protect Nan by circulating the slogan “Love Nan... Save Nan... Don’t Come Back to Nan”.



*Nan Civil Society against COVID-19*

## **Collective Social Measures: Strategies to Save Nan**

The first strategy to Save Nan was to prevent the disease entering Nan from outside the province. Three screening points operating 24 hours a day every day were set at strategic locations on Nan’s borders: Vieng Sa point at the south, Song Kwaie point at the north-west, and Na Noi point at the east. Thousands of people from other provinces were screened every day. The chief district officers or their assistants would always stand by and supervised their teams at the screening points. Each team consisted of public health personnel, policemen, soldiers, local authorities, heads of villages, and volunteers.

The process at the screening points comprised of five distinctive steps:

1. Policemen stop each vehicle.
2. Soldiers visually check all persons and their vehicles.
3. Health volunteers make sure each entrant has a temperature check and a thorough hand washing.
4. Public health personnel orally and visually screen each entrant.
5. The team records the data from each potential entrant. The same important questions are repeated thousands of times each day... “where are you from?” ... “where do you want to go?” ... “what do you come to do in Nan?” . . . “who will you visit in Nan?”



*Checking temperature at Vieng Sa screening point*



*Screening point at Song Kwae District*

Only people who are family's members of Nan residents or people with necessary business to do in Nan were allowed to enter the province. After finishing the screening procedure, if any traveler was considered to be a high-risk person, that one and his or her companions were required to be quarantined for 14 days before the entry was allowed. Their data were sent to a head of their own village, and a place for quarantine was set either in their own homes or in village quarantine places under professional supervision of nurses from that district's communicable disease control unit and public health volunteers who have been trained in COVID-19 prevention.



*Local quarantine in a community of Nan*

*Daily  
temperature  
checking  
during  
quarantine*



Challenges in the early stages of working at the screening points included a lack of essential materials and a shortage of professional health personnel from the public sectors. Nan civil society played an important role in the process by providing materials and food for people working at the screening points. All screening points in Nan province operated for almost three months until a week after the Thai government cancelled the Emergency Decree on 15 June 2020.



*Nan Civil Society against COVID-19 provided materials and food for people working at the screening points*



*Nan residents made a donation for people working at the screening points*

The second strategy to Save Nan was mass communication to the public about the COVID-19 risk and how to effectively prevent it from spreading. Every day, the provincial health office would develop one-page summary, presenting the situation of infection in 3 level: national, provincial, and district level. This page was distributed by various medias to warn people to be strict in keeping personal prevention measures and it was found that it helped much, people always talked about statistic in one-page summary of each day. The formal messages at the provincial level were broadcasted using a deputy governor as a spokesperson. The messages were also distributed through other various communication means, including local radio broadcasts, one-page reports, and group lines.





*Mr. Niwat Ngarm-thura,  
a deputy governor of Nan  
Province who is  
a spokesperson*

The department of disease control, ministry of public health distributed accurate reliable information to provincial health office, then these health messages were passed down to village health volunteers, who were an important interface between the formal health system and the community. These village health volunteers knocked on the door of each house in their village to inform the residents of important health messages, and demonstrated hand washing to prevent the disease. Nan Journalist Association as a member of Nan Civil Society Against COVID-19 operated several local radio channels to communicate these messages in a variety of local languages.



*The village health volunteer informed the villager of important health messages*

The third strategy to Save Nan was to reduce negative health and social impacts of COVID-19. People were convinced to stay home by the slogan ‘stay home stop the disease for the nation’ after the government announced the Emergency Decree. Essential health care for vulnerable groups, such as children and older people, were ensured by health care teams, which included village health volunteers. The village health volunteers took comprehensive basic care of their villagers with the ratio 1 volunteer per 12 households. Chronic illness patients were delivered essential drugs at home every 3 months.

Social distancing was an important measure to reduce risk of the infection. There are many rituals in Thai culture and tradition as well as religious ceremonies that bring people to join together. Nan people mutually set their own regulation to limit the number of people in every group activity, even in the funeral ceremony.



*The village health volunteer delivered essential medicines for chronic patients at their houses*



*Social measures at the funeral ceremony*



## The Importance of Maintaining a Sufficient Economy: Asset to Tackle COVID-19

Food security is crucial in every crisis situation, including this pandemic. We saw usurping crowds and goods hoards in many countries when the country locked down due to the pandemic. On the other hand, Nan residents have been very willing to share food and supplies with their neighbors and even strangers in need. Their shared belief in the importance of maintaining a sufficient economy was deeply held in the community and united the community to support every level of businesses for the sustainable overall economy there. Shared beliefs and principles of moderation, reasonableness, and self-responsibility for building immunity in the community, along with morality and knowledge were crucial components of all the efforts to save Nan residents from COVID-19.



*Food sharing at Na Rai Laung Subdistrict*

At the early stages of the pandemic, there were severe shortages of all essential supplies, including temperature checking instruments, alcohol gel, and masks. People in Na-Rai-Laung community in Song Kwaee district, a district where the Nan model of maintaining economic sufficiency was implemented, made their own masks by using money from their community health fund to buy essential materials for making them.



*Making fabric masks for their people*

Community Health Funds (CHF) have been established by the National Health Security Office (NHSO), Ministry of Public Health, Department of Local Administration, and Ministry of Interior under the concept of decentralization pursuant to the National Health Security Act B.E. 2545 (2002) and Determining Plans and Process of Decentralization to Local Government Organization Act B.E. 2542 (1999), focusing on people participation at the subdistrict level. The CHF primarily aims to support health-related activities,

including health promotion, prevention, rehabilitation, and proactive primary health care. These activities need to be done by communities and related organizations based on community demand and readiness. The committee of Na-Rai-Laung CHF had approved a COVID-19 prevention project, and funded it about 7,000 USD. The project had supported buying 2 infrared thermometers for each village, building hand washing sinks, buying masks for children at the child center of the subdistrict, and compensation for health volunteers.



*The meeting of Na-Rai-Laung Community Health Funds committee*

*Check point at a child center of Na Rai Laung Subdistrict*





*Masking & Distancing at a child center*

## **Adaptation to New Normal Life**

Life of all people around the world will never be the same since the pandemic of COVID-19 had started. Every day we still see people wearing masks, volunteers checking people's temperature at popular places, alcohol gel and hand washing sinks, and QR code of Thai Chana<sup>†</sup> at community checking points. Most of the people seemed to pay very good cooperation, no one was found to violate the social rules. This reflected the strong engagement of people to save Nan.

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<sup>†</sup>In Thai, means "Thai win" It's an application of the government for recording time-line of each people's movement.





*Screening procedure is continuing at Wat Nong Bau,  
a popular place for tourists*

The economy of Nan is based on agriculture and tourism. The COVID-19 pandemic has very adversely impacted Nan's economy, and Nan people know they must adjust to the coming new normal. In the three districts where the Pid Thong Lang Phra Institution for Activities Promotion and Development project was implemented, people commonly grow organic vegetables. These vegetables are sold at higher prices than non-organic vegetables. Many people have learned other methods of adding value to their products. Hmongs, a major ethnic group at Na Rai Luang, applies Hmong cultural practices in growing rice called 'Kao Hmong Kwau' (Hmong roasted rice) and are able to sell it at higher prices.

Mien embroidered indigenous costumes are famous for their beautiful handmade work and provide a good source of income for the elderly in this ethnic group, but this time, the pandemic has made it more difficult to sell. Responding to this additional difficulty, community leaders such as the president of Na Rai Luang Subdistrict Municipality have helped create new ‘online marketing’ methods for these precious costumes and other products based on the slogan ‘Nan leaves no one behind’.



*Making ‘Kao Hmong Kwau’  
(Hmong roasted  
rice)*



*‘Kao Hmong Kwau’*



*Mien embroidered indigenous costumes*

### **Key Success Factors**

Although no one in Nan province declares complete victory over COVID-19, but they are rightfully very happy and proud of zero COVID-19 case in their province. The strong community engagement and effective communication were key success factors. People in Nan province have a collective leadership and a culture of loving their hometown. They readily engage in every step of process to protect their hometown from the COVID-19. They mutually decide their best strategies and seriously implement those strategies to save their hometown. Effective communication and education were accomplished using reliable local sources and people in Nan province. Important information was distributed from the province level to each community by trusted local people with the local languages. This made each community more receptive and appreciative of the information coming from the province level, and more committed to comply fully with the strategies.

Can't help mentioning that another important factor supporting the success in Nan is the strong comprehensive health care system of Thailand. Thailand has made long-term investments in its health care system, both in infrastructure and in human resource management & development. Seamless cooperation between the provincial and community level enable all stakeholders to work very well as one team against a new adversary such as COVID-19. Experiences with infectious disease outbreaks including SARS-1, H5N1 avian influenza and MERS helped Thailand build expertise and enhance preparedness, leading to comparable success. Many health personnel, especially infectious control nurses, are now much better trained and better equipped. These people are prepared for rapid response to an outbreak and working together with local health volunteers to give each community its best chances to prevent and control the disease.

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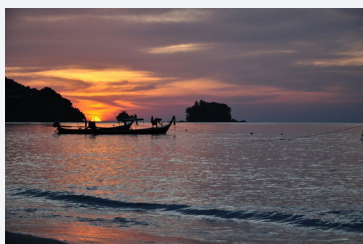
# 4

## The Synergy of Public and Private Sectors to Tackle COVID-19 and Revitalize Phuket towards Sustainable Medical and Wellness Tourism

Kamolrat Turner  
Sukjai Charoensuk  
Panarut Wisawatapnimit

# The Synergy of Public and Private Sectors to Tackle COVID-19 and Revitalize Phuket towards Sustainable Medical and Wellness Tourism

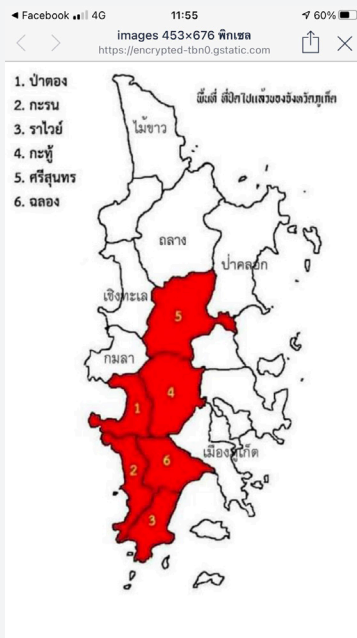
Kamolrat Turner  
Sukjai Charoensuk  
Panarut Wisawatapnimit



*Phuket, the pearl of the Andaman*

## Introduction

Phuket, known as “the Pearl of the Andaman”, used to be a dream destination of both Thai and overseas tourists for its spectacular scenery, world recognized magnificent beaches, eco adventure and typical culture. It is considered an important tourism city of Thailand, having a large number of tourists each year, especially those from overseas. Tourism accounts for ninety percent of the income for Phuket. Previously, an annual income of over 470,000 million THB (16,000 million USD) was mainly derived from tourism.<sup>1</sup>



*Infected districts*



*Many people were at high risk and needed to get a test*



*Rushing time of health workers*

The big hit of the COVID-19 pandemic in March 2020 has had a huge impact on Phuket normalcy and especially on the economy. Phuket was the province with the second highest number of COVID-19 infected people in Thailand in March 2020. The synergy of the public organizations, the private sector, and communities, along with experience of Phuket in dealing with the past emerging infectious diseases such as SARS and MERS, helped it deal with the new pandemic and ease the problem within a short period of time. It had remained at zero cases of infection since the end of May until the late December 2020 when the new wave of infection began.

Phuket needs to recover its main business with a new sense of normalcy and the adoption of new ways of tourism management. The previous ways of life and tourism of Phuket may be no longer appropriate with the current situation that is being threatened by COVID-19. “Wellness and Happy City is an optimal goal of developing Phuket”, said Mr. Narong Woonciew, the Governor of Phuket. “To revitalize Phuket towards sustainable medical and wellness tourism, we need to start with its residents. Phuket’s dwellers as a host must be well and happy first before they welcome tourists from outside.”



*Mr. Narong  
Woonciew, the  
Governor of Phuket  
Province*



*Beautiful  
Phuket*

## **Phuket at a glance**

Phuket is the largest island in Southern Thailand, on the west-facing Andaman Sea coastline. Its area is approximately 544 square kilometers with the length and the width of 48 and 21 kilometers respectively, surrounded by the Indian Ocean. Travelling to Phuket can be by air, land or marine transportation. It is a tourism haven as well as an emerging meeting destination.

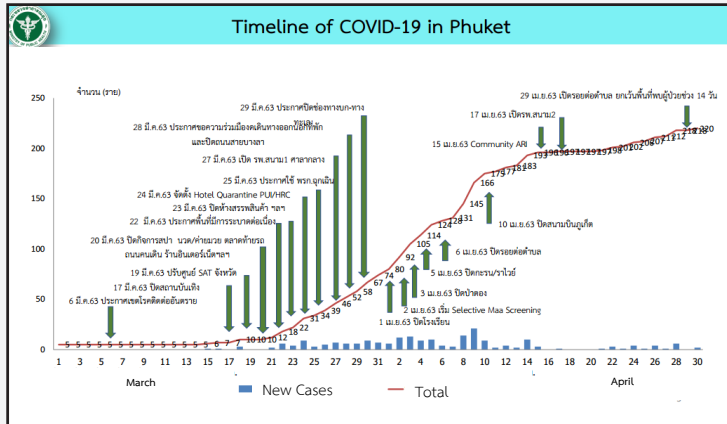




*Quiet Phuket after the first hit of COVID19*

## **Synergy of Public and Private Sectors to Tackle COVID-19**

Like many other tourist reliant cities, Phuket always be embellished with foreigners, over 14 million tourists from overseas visit here each year, surely it's a target of the COVID-19 pandemic. The city of paradise was hit suddenly in March 2020. All businesses were closed, resulting in decreasing city income which is mainly derived from tourism.



**Figure 1:** The number of COVID-19 infected cases differentiated by new cases and accumulate cases (1 Mar -30 Apr, 2020).<sup>2</sup>



*Collaboration of all sectors to deal with COVID-19 outbreak.*



Managing the COVID-19 outbreak situation in Phuket was very challenging and complicated for the province accommodated with workers across Thailand and tourists from all over the world. Phuket has responded well to the pandemic, with strong collaboration of stakeholders and strategies including a super lockdown, active case finding plus very close-up monitoring, local quarantine, field hospital, and fund raising to support its people.



*The entire area of Patong Subdistrict in Kathu District of Phuket was locked down to curb the Covid-19 spread.  
(Photo by Achadtaya Chuenniran)<sup>3</sup>*

Super Integration, Super Lockdown and Active Case Finding were the outstanding strategies used in Phuket to control the outbreak in March 2020. Key government officials in the province including health workers, non-health workers, local administrative officers, soldiers, and polices, had cooperated with



*No one left behind in the lockdown areas.*

the private sector, including business owners, health volunteers, and other village leaders to screen for COVID-19 cases and carry on other prevention and control measures.

Super Lockdown meant the lockdown measure of 3 levels at: provincial level, district level, and subdistrict level while in some areas such as Moo 2 of Bangtao Subdistrict, special lockdown was done at the village level. The chief of the village health volunteers in Moo 2 of Bangtao subdistrict said, “3 to 4 cases were found in the village during the peak time. Without the help of key organizations and key persons, we would not have been able to manage such a stressful situation. Our village health volunteers also played important role to rapidly ease the situations.”



*Active case finding in a community*

Active case finding was performed not only for screening in the risk groups, such as night club workers but also asking all pharmacies and all medical clinics in each community to report suddenly when acute respiratory infection was found.



### *Turning Phuket city hall into a field hospital*

The success of the field hospital set up within 48 hours has also provided evidence of strong synergy among Phuket stakeholders. Dr.Chalermpong Sukontapol, MD., the Director of Vachira Phuket Hospital said “It was a miracle that we can build a hospital within 48 hours. As the number of COVID-19 infections increased among both Thais and foreigners, the capacity of hospitals in

March, 2020 was inadequate. We asked permission from the governor to turn the new city hall into a field hospital.” With strong collaboration of the public and private sectors plus the residents of Phuket, a field hospital with all medical supplies and PPEs was ready to admit 104 COVID-19 patients on 27 March, 2020.

*Dr.Chalermpong Sukontapol, MD., the Director of Vachira Phuket Hospital and a member of the leading team in establishing the field hospital.*



Phuket could control the infection outbreak within a couple of months, from middle of March to the end of May 2020. It has remained at zero case of infection since the end of May until the late December 2020 when the new wave of outbreak began in Samutsakorn. As of January 2, 2021, a low number of only 3 infected cases has been reported.

### **Revitalizing and Preparing Phuket towards Sustainable Medical and Wellness Tourism**

After that critical point of the outbreak, even though Phuket could control the infection since late May 2020, it was still very quiet like an abandoned town. It is the time to revitalize Phuket to balance among health, wellness, and economy. The synergy of all sectors is now

adopted for the recovery and Phuket is expected to be a safe, healthy, and happy destination. “Wellness must begin with Phuket dwellers”, said the governor. “The hosts must be healthy and happy first, so they can welcome and provide wellness and happiness to the tourists.”



*Dr. Tanit Sermkaew, MD.,  
Chief of Phuket Provincial  
Health Office*



*Chief Thanit Sermkaew leads  
a meeting on the COVID  
situation in Phuket.*

Phuket has synergized all involved parties, including business, industries and public agencies, to restore and make Phuket a safe haven for tourists. All key representatives have been engaged in the Phuket Communicable Disease Committee and Phuket Provincial Disease Control Center. Social measures are taken and applicable laws are enforced to ensure safety. A Phuket model of 5 Ts strategy is implemented with strong prevention measures.

### **5 Ts Strategy, Phuket Model**

The 5Ts strategy has been practiced to ensure Phuket is a safe place for local residents and a safe destination for tourists. Dr. Tanit Sermkaew, MD., Chief



of Phuket Provincial Public Health Office said “We use 5 Ts strategy as the Phuket Model to manage the outbreak situation in March.” According to his explanation, the 5 Ts strategy means as follows:



**Figure 2:** The flow chart illustrating steps for checking in tourists from overseas at Phuket Airport.<sup>2</sup>

**1) Target:** This target is meant the target group of tourist business. They prefer tourists with low risk of COVID-19 infection and those from low infectious rate countries;

**2) Testing:** COVID-19 testing must be conducted before departing from home countries and once arriving at Phuket International Airport. There is a mobile laboratory which is a royal car (container) given by his Majesty the King ready to screen for COVID-19. Then they will be quarantined for 14 days. Two more tests will be done, one on Day3-5 and another one after 10 days of quarantine. For local residents, surveillance of

COVID-19 is expanded to screen all suspected persons. COVID-19 test is performed at all levels of healthcare facilities including public and private hospitals and clinics plus pharmacies. There is also a surveillance system set for patients with respiratory syndrome and pneumonia. People who have influenza-like symptoms will be monitored closely. The screening test that is conducted outside a health care facility can issue results within 1 day;

**3) Tracing:** A tracing system is set to monitor the tourist after 14 days of quarantine. There are 21 Communicable Disease Control Units (CDCU) in Phuket working for the surveillance and identification of low risk and high risk people.

**4) Treat:** Phuket has both public and private hospitals readily prepared with full medical equipment and PPEs as well as well-trained health care workers to treat COVID-19 patients.

**5) Trust:** Building trust is an important measure that needs to be established through various measures among local people and tourists. They need to be informed about the good surveillance system and unquestionable capacity to accommodate infected patients. The Center of COVID-19 Situation Administration will check things well before the first overseas tourist group travels to Phuket.

## **Prevention**

Preventing measure by strictly screening at the airport and the marine port is performed to stop bringing in the virus from outside the country. A rehearsal of a plan to welcome overseas travellers at Phuket Airport



also has been performed. The preventing measure follows the guideline of the Department of Disease Control. New normal way of life has been campaigned regularly. Communication and education have been continually provided to people.



*Temperature checking at Phuket Airport*

## **Phuket, a Safe and Happy Destination**

“The positive side of the outbreak of COVID-19 is that having no tourists has allowed the nature to recover. It can be said that Phuket after the outbreak is more beautiful than before”, said Mr.Bhumikitti Ruktaengam, President of Phuket Tourist Association. “Phuket will be like a heaven of tourists and a safe haven for local residents just as before”.

“Our business cannot survive without foreigners. To make them visit us, we must strongly use comprehensive measures to make them trust”, said Mrs. Ratanada Choobal, President of Health and Wellness Phuket Spa Association.



*Mrs. Ratanada Choobal,  
President of Health and  
Wellness Phuket Spa  
Association*



*Milk & Floral bath*



*Relaxing massage*

Former ways of tourism are no longer suitable for Phuket. The governor has further introduced the notion of a roadmap that start from promoting local tourists to visit Phuket, and waited for overseas tourists to come. Prevention measures are carefully planned and strictly implemented along with various joyful activities.

## Quarantine

Alternative happy quarantine has been planned to make a 14-day quarantine not too boring. Various forms of alternative quarantine have been established including yacht, villa, hotel, and resorts with a set of measures to ensure safety. The cost of stay varies to serve customers' satisfactions. Alternative Yacht quarantine (AYQ) is available for those who live in their yachts. They will need to follow the quarantine protocols set for AYQ for 14 days.



*Enjoyment in Phuket*

## **Key Success Factors**

The key success factors of Phuket management in response to the COVID-19 situation are: 1) the synergy of all sectors; 2) strong leaders including governor, chief medical officer, and hospital directors, business leaders; 3) the awareness of the people with very good cooperation; 4) experience of public health and medical teams along with involved organizations; and 5) adequate PPEs supported by all sectors.

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5. Mr. Chalermpong Sukontapol, M.D. Director of Vachira Phuket Hospital;
6. Miss ChernpornKanjanasaya, Chairman of Federation of Thai Industries Phuket Chapter;

7. Mr. Bhumikitti Ruktaengam, President of Phuket Tourist Association;
8. Mrs. Ratanada Choobal, President of the Health And Wellness Phuket Spa Association;
9. Mr. Uthai Mantiantipun, Director of the National Health Security Office Region 11 Suratthani;
10. Miss Nisarot Songprasirt, an officer of the National Health Security Office Region 11 Suratthani

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**With the cooperation of:**

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Nan Provincial Office

Nan Provincial Health Office

Na Rai Luang Subdistrict Municipality

Nan Journalist Association

Nan Civil Society

Nan Hospital.

Phuket Provincial Office

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***“True Success is not in the learning, but in  
its application to the benefit of mankind.”***

**HRH PRINCE MAHIDOL OF SONGKLA**



**National Health Security Office**

Government Complex, Building B , No. 120 ,  
Moo 3 , Chaengwattana Road , Tungsohong Subdistrict,  
Laksi District, Bangkok 10210  
Tel 662 1414000 Fax 662 143 9730-31  
e-mail : [interNHSO@nhso.go.th](mailto:interNHSO@nhso.go.th)  
website: <http://www.nhso.go.th>