Reflections for the first three quarters of 2020

Fighting COVID-19 in Thai Styles

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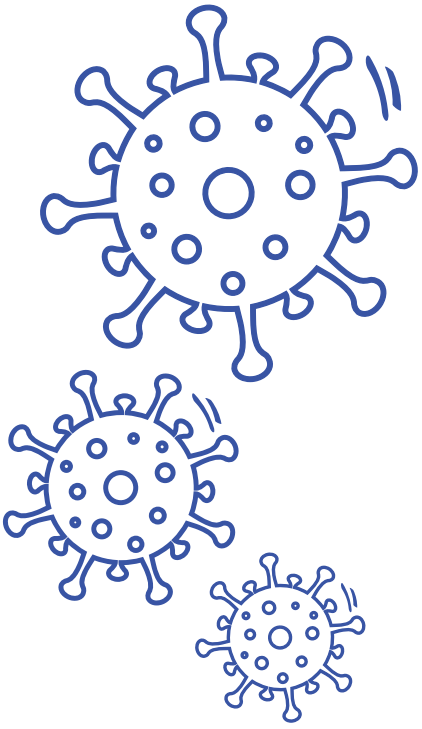

NHSO National Health Security Office
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It takes time for COVID-19 to circulate to all countries. At the early stage, we see only outbreaks in high- and middle-income countries. Only a few cases are reported from India, African countries and those neighbouring Thailand such as Myanmar, Cambodia and Laos,

Countries are different in responding to this epidemic, depending on their socio-political, technology and health system background. The oriental countries like China, Singapore, Korea and Japan have deployed all the technology and state power they have to tackle the problems. However, they are still different. China requires all their people to eliminate the disease. Even though currently there are not many new cases, people who travel across provinces are still required to undergo state quarantine. They probably hypothesize that the disease can be eliminated, which will be followed by quick economic recovery. Singapore thinks differently. They depend mainly on case contact tracing. They considered that strict control will lead to too many economic problems. This strategy is similar to that in Korea, Japan, Indonesia and many western countries. Information technology is heavily deployed in Singapore, Korea and China. Information on people's

movement, which improves Public Health security, gets the priority over individual privacy.

The United Kingdom is a country with many well known scientific philosophers and epidemiologists. Dr John Snow was praised as the founder of Epidemiology from his research to prove that a cholera outbreak in London was linked to water supply. After he disassembled the pump on Broad Street, cholera gradually declined.

I don't think that the current UK government follows John Snow. They are more likely to have Malthus' pessimistic viewpoint that with increasing population, human catastrophes including a pandemic are inevitable. They may take actions along the Adam Smith's "faith of the invisible hands", which will manage the society. The leaders may also take a Darwinian view on survival of the fittest. It is hoped that COVID-19 survivors will have enough immunity against the disease. When the proportion of the immune population (so called 'herd immunity') is high enough, the virus will not be able to transmit and the disease will be eliminated.

Were Smith, Malthus and Darwin alive, they would be proud but that's not the case for John Snow.

Epidemiological methods of disease control have moved very far from Snow's era. With advancement in sciences and technology, cases of atypical severe pneumonia in Wuhan, China were rapidly proved to be caused by SARS CoV 2. Its RNA pattern is an important marker of the infection, which is called Coronavirus

Disease 19 or COVID-19. Transmission was identified as inhalation or mucosal contact of the infectious droplets emitted by an infected person when sneezing, coughing or vocalizing. With advancement of health systems, once a case is identified, persons who have been recently contacting the case are identified, investigated and self-quarantined.The process will cut the disease transmission and prevent case spreading.

In high-income countries, this contact tracing is done by public health officers and sometimes the police. In Thailand, early case detection is facilitated by village health volunteers (VHVs). This VHV system was first initiated in the late 1960s when leaders of Public Health from Thailand visited and observed activities of barefoot doctors in China. While the roles of Chinese barefoot doctors included clinical treatment, the Thai VHV's main role was to interface between the health systems and the villagers. Each VHV is closely linked to approximately 10 neighbours. In COVID-19 outbreak period, they play key roles in neighbourhood health education and identifying COVID-19 suspects, especially among those arriving in the neighbourhood cluster from a COVID-19 outbreak area. With early identification of suspects by the VHVs and their effective communication, transmission was then interrupted.

The number of COVID-19 cases in Thailand first surged in Bangkok from a few super-spreading events in boxing stadia, pubs and bars. When the government started to lock down Bangkok, it was afraid that the disease would disperse to all parts of the countries as people would flee out from the capital. This was the case because the super-spreading events were attended by people

from numerous outskirts. In reaction, the health system emergency responses were then activated immediately to contain the outbreak. All hospitals were partially closed and accepted only emergency cases. Isolation wards were ready to admit COVID-19 patients. All outpatients and accompanying persons were thermo-scanned. Personal protective equipment is rapidly procured and distributed. There was a lot of cheering on social media to encourage the medical profession to fight against COVID-19.

But Thailand has proved that prevention is better than cure. The VHV network worked so well to achieve timely detection and isolation of all new cases in the peripheral areas that transmission was eventually interrupted.

There is another epidemiological explanation on the success of this transmission interruption. A well known term 'reproductive number' or R indicates how many new cases will be transmitted from one index case. This number had been initially high when the level of population's awareness of the epidemic was low. Under the conditions of heavy crowdedness and close contact in closed space in the afore-mentioned super-spreading setting, an infective person can transmit the virus to infect several people in that setting. The initial R or so called R0 (R zero) was extremely high. With prompt suspect identification and contact tracing, subsequent Rs were reduced. For example, a study by the investigator team of the Department of Disease Control showed that an average case usually had slightly more than two contacts in his/her household. The probability of each contact getting infection (subsequently having a positive RT-PCR test) is around 20 percent. Simple math

can show that this will result in R being less than one. For this epidemiological reason, some weeks after the super spreading events, the total number of cases in Thailand peaked at around 100 and declined to nil within a few months.

Epidemiology is the study of health status in the population regarding its distribution, determination and intervention. The subject is not only interesting but also an important tool for outbreak control. Out of several epidemiological studies published in academic journals, one carried out by the Thai National Contact Tracing Team deserves mention here. Apart from field work, one of the routine jobs of this team was to compile data from COVID-19 contact tracing from the whole country. The data set consists of information on the index cases (who had a lab confirmed diagnosis of COVID-19) and the persons who were physically close to them. During the interview of these contacts, information on their potential risk behaviours was also noted. Among these contacts, some of them would become diseased (having confirmed diagnosis of COVID-19). The majority would remain to have negative tests. These two groups (211 diseased vs 839 non-diseased) were then retrospectively compared on their behaviour during the period they were in contact with the index cases. The odds of having a specific behaviour among those eventually getting the disease were compared with that among those remaining non-diseased. The ratio between these two odds is called odds ratio or, in brief, OR. An OR of lower than 1 indicates that the behaviour is protective against getting COVID-19 during the contact period. An OR being larger than 1 indicates that it is a risk factor. Pertinent protective factors (and the OR) were shortest distance physical

contact being more than 1 metre (0.15), duration of contact within 1 metre range less than 15 minutes (0.24), washing hands during the contact period (0.34), wearing mask all the time of contact (0.23). On the other hand, sharing cigarette and vaping device is a risk factor (OR=3.4). Had all these protective behaviours been practised and cigarettes had been abstained by all contacts, the number of contacts who would become a case would be reduced by 84%. All these suggest that even with contact real COVID-19 cases, the risk of getting the disease can be dramatically reduced by strict hygienic practice. In fact, a reduction of 84% is only found in highly effective vaccines. So prevention and control of COVID-19 does not need to await vaccine availability.

Here are some additional case studies in the field in the southernmost part of the country, Chana District of Songkhla Province, where insurgency erupted in 2004 and just recently declined after one and a half decades. A majority of the local population are Muslim, who have active religious connection with their counterparts in nearby Muslim countries where the transmission of COVID-19 was established. Returnees from religious ceremonies in those countries brought back the disease and infected local residents in their community. While the local health systems panicked about this new deadly disease, the VHV successfully persuaded all the returnees to come to the hospital to get the lab test. Six tested positive and were admitted at the community hospital following the national guideline. All of them were given good care that satisfied both the patients and the relatives. Luck was on their side, none of them developed any serious symptoms and all were discharged 14 days after admission. The villagers highly

appreciated the local hospital. They brought in fishes caught from the local seas to give to all hospital staff as an act of appreciation. This did not only stop disease transmission but also strengthened bonding between the community and the local health systems. It should also be noted that long-term investment in the Thai rural health systems has paid off here. As community hospitals could take care of most of the cases and refer only a few complicated one to the secondary and tertiary hospitals, the capacity of the country to absorb the cases is well expanded. In a subsequent bilateral technical conference between Thailand and China, we learned that the health systems in Wuhan, the first affected city of China, failed to initially contain COVID-19 because of the weakness of the rural health system in that country. With inadequate quality of personnel and health services in China, rural people distrust the local systems. All fled to the city and overwhelmed the major infectious disease hospital, which needed a call for help from doctors from other provinces and a new emergency hospital to be built up in a rush. Thailand does not have the wealth recently acquired by China;.however, the Thai harmonious investment in the systems has proved to bring health security to its citizens.

Another interesting case study was around 100 km southward, in Yala province, the epicenter of insurgency violence in the past and the hard-to-reach community for the current COVID-19 outbreak. Local VHV's reported that there was a substantial number of silent returnees in a few subdistricts. The head of the villages showed up and requested the governors to send health teams to do mass screening for the virus. This was done for nearly a week in the nighttime during the Ramadan fasting period. Here

the concept ‘Health as a Bridge to Peace’ was demonstrated. The hard-to-reach communities have become more open due to the trust in the health care provided.

Thailand was the forerunner among Low-Middle Income Countries (LMICs) in setting a National Health Security Office to ensure Universal Health Coverage (UHC). This started in 2002. Over nearly two decades, the Thai UHC has demonstrated the three dimensions of good health insurance, namely, breadth (covering all citizens with inclusive policy), comprehensiveness (including all forms of services) and depth (being an effective safety net against financial catastrophe). Moreover, it incorporated quality systems that take into account service standard, clinical outcome and responsiveness to clients’ needs.

In the COVID-19 period, Thai UHC covers the costs of laboratory screening for the population, confirmation test for the suspect and of course case treatment. The next case study illustrates the extension of UHC to cover uncommon activities in a border area.

Sadao District of Songkhla Province is a border city next to Malaysia. The cross-border checkpoint has the heaviest land transport traffic in the Kingdom. Malaysia and Singapore both have relatively strong economies. It was estimated that 200,000 Thai citizens worked in Malaysia. The outbreak in Malaysia was followed by a lock down process, which caused the majority of them to become jobless. The border was closed so there were a lot of Thais waiting to get permission to enter their homeland. It

took about a week for Thai border provinces to set up a ‘State Quarantine - SQ’ system to receive the returning citizens. At first, schools were requested to provide the space for accommodation. Later there was a better resolution. Hotels along the borders were trained and inspected to get ready to serve as SQ facilities. Food and other necessary services including Internet access, were provided appropriately. The SQs are also looked after by health personnel on health aspects including temperature taking, referral to the hospital for testing for the virus etc. The whole 14-day service costs for returnees with negative tests were charged to the National Health Security Office. Also thanks to the Provincial Administration Authority who financially contributed to the first few days before the NHSO system was settled.

As an important border city, Sadao is also the most important transit point for illegal migrant workers from Thailand to Malaysia and Singapore. With over 600 km of border, there are many possible points for this trafficking. Sadao is a natural resting point for illegal border crossers. Thus, there have been many illegal immigrants arrested. Among seven detention centres taken care by the Department of Immigration, Ministry of Interior, the one in Sadao is the second largest. During the COVID-19 outbreak period, there were more than a hundred detainees in this detention centre. The outbreak in Sadao centre was the most remarkable.

The story started with a pneumonia patient who was an immigration officer. He was admitted at Songklanagarind Teaching Hospital and had a positive RT-PCR test for SARS CoV 2. A local disease investigating team suspected that he might get the virus

from the detainees. They performed contact tracing and found that 18 among 28 detainees in the second floor of the front section of the detention centre had positive RT-PCR tests. Locally, it was not easy to manage the infected detainees who stayed together in a crowded and poorly ventilated condition with others who had negative test results. According to the national guideline, all RT-PRC positive COVID-19 cases are to be admitted in an isolation room at a hospital to prevent further spread of the virus. In this instance, as all cases had only mild symptoms, it was decided that the detention section of these 28 persons should be modified into a ward of a primary care hospital with health personnel in charge 24 hours a day. So this became a mixture of a hospital ward and jail. A team of engineers was consulted to improve ventilation by installing external exhaust fans. Another team of IT engineers was consulted to use robots to take the temperature of all detainees. Personnel were heavily shielded with PPE in delivering food, medication and supplies and taking out the solid wastes.

Around 10 days after the outbreak was detected in the first section, a second outbreak was detected in the second (rear) section, where forty long-term illegal immigrants (Rohingya) were detained. They had probably been infected soon after those in the first section. Delay in detection of this group was attributed to lack of cooperation of the second detainee groups. They are more internationally vulnerable illegal migrants as they cannot be deported like those in the first section, who are mostly ASEAN citizens. The second ward was then set up in this section. A pregnant detainee was admitted at the tertiary hospital for safety reasons. Fortunately none of these two groups developed any complications. All had full recovery and continued their lives in the centre. About six weeks later, eleven Myanmar detainees, whose RT-PCR tests had become negative, were deported back to their home country. Altogether, there were sixty people getting confirmed infections at this centre. Around one hundred immigration personnel were required to self quarantine. No serious clinical problem was observed. It was good to see that none of the health personnel who worked very hard in this operation was infected.

Thailand not only is an international transit for migrant workers. It also serves as a destination to find work for a few million from Myanmar, Laos and Cambodia. It is not known how many migrant workers returned home and how many remained in Thailand in response to the COVID-19 outbreak. The borders with all neighbouring countries were officially closed. Yet there are numerous passing points along the over 5,000 km borders, making it hard to prevent people illegally entering and exiting. Singapore and Malaysia both reported a series of COVID-19 outbreaks among the migrant worker camps. There have been a series of screenings for the coronavirus among thousands of the migrant workers at various worker camps in Greater Bangkok. None of them showed any positive test. There have been strong requests from the business sectors to import new lots of labour but the demands were not met. Some Thai argued that the vacant work opportunities could be offered to either Thai residents of retained migrant workers who are waiting for jobs inside Thailand. The Department of Labour showed that there are many jobs not receiving any interest from these two groups such as sea-fearers.

Socio-economic problems are serious COVID-19 complications worldwide. Thailand has been hardest hit as international tourism is one of the main sources of the country's income. Many related businesses such as airlines, hotels and restaurants have become inactive. The government must launch different kinds of direct and indirect financial support for jobless people.

The country has had an internal COVID-19-free period for about 100 days. People are encouraged to travel inside the country. Yet the internal market is too small to make substantial economic recovery. Industrial exports are also badly hit by the global shortage of purchasing power. Apart from government officers whose jobs are still quite secure, the least hit sector was agriculture. Thai farmers generally have their own food security. The prices of food and farm products have also been relatively stable. Socio-economic and psychological stresses were then most heavy among those who lost their jobs or businesses.

Worldwide, children are expected to be the hardest hit age group from the COVID-19 pandemic. Starting from 2020, serious famine is expected by international relief organizations. Day-care centres and schools for young children have been closed for nearly 6 months in response to the pandemic. For children of poor families, these day-care centres/schools are their safe haven to escape from home violence to shelter in a peaceful and clean place, get enough food and rest while their parents/guardians can have more free time to carry on necessary earning or household tasks. A survey carried out by a research team in the southern border province revealed that during the lockdown period, young children had 10% increase chance of experiencing physical abuse and 20% increase in receiving verbal abuse. Qualitative in depth interview indicated that food is less available and there are sporadic events of sexual abuse carried out by some unemployed household visitors. We are waiting to see the changes in nutritional status of the children who have returned to the day-care centres/schools.

More global bad news from UNESCO informs us that around one-third of children undergoing compulsory education may not return to school in the second half of 2020, perhaps due to economic hardship of the government and the household. We do not have this kind of statistics from Thailand but there are reports of such cases by NGO in the border southern region.

Among households whose children continue with formal education, COVID-19 has brought in another financial constraint, on-line education. They have to invest in hardware such as computer and Internet access to their homes. This can be more than 10% of the income of many households in that month, a cut-off value for financial catastrophe were the expense to be on health. Certainly, on-line gives a new opportunity for affordable families to learn new things at a low cost. However, in the pandemic period, this ‘Digital Divide’ has been widened among the ‘Have Net’ (affordable to pay for the on-line education) and the ‘Have Not’ (the unaffordable).

Throughout the first half of 2020, mainland ASEAN countries including Myanmar, Thailand, Laos, Cambodia and Vietnam could prevent or handle the COVID-19 outbreak quite well. In August,

Vietnam after being case free for about 100 days had an outbreak in a tourist spot. It took them about a month to get the situation under control. Then there has been an influx of cases from the Bangladesh border to Myanmar, who then entered the main city, Yangon. In addition to this regional pressure, in September 2020, there were sporadic confirmed cases of COVID-19 among those never who had never left the country and foreigners who were suspected of getting infected while staying in Thailand. This may be an indication that the country is not absolutely free from this virus. On the other hand, the pressures from business to import migrant labour and to partially open the country for international tourism are increasing.

Globally, the second wave of COVID-19 pandemic has arrived. More cases are being reported but fortunately with lower mortality. This follows the pattern of man-made myxoma virus epizootic (outbreak of a communicable disease among wild animals) to contain the population of wild rabbits. The initial fatality rate of the rabbits was very high but then subsided and was followed by a series of less serious outbreaks. This has been explained by co-evolution of the virus and the rabbits. Virulent strains of the virus killed the host too quickly and lessened its chance to infect the next host compared to the less virulent strains. The strains of rabbit that can develop immunity against the virus also have better chance to survive and reproduce. Thus the ecology will end up with less serious outbreak. For the COVID-19 pandemic, we still have to see whether the myxoma virus-rabbit analogy works. Information on how the level of virulence to the new SARS CoV 2 strain has changed is still awaited. Several studies showed that

the infected populations do not develop enough antibodies to eliminate the transmission but human-being's evolution is faster on the social than the biological side. We hope that the global health systems will improve. We are asking for strong global leadership and collaboration to fight and eliminate this coronavirus the same way we defeated smallpox.

Being desperate to control the COVID-19 in their countries/regions, many rich countries are racing and betting on vaccine development. The wish is that if an effective vaccine is available, it can be the ultimate solution for the pandemic. In theory, this is not the case. As COVID-19 is a very contagious disease and there is no natural immunity, we need a very highly effective vaccine (say more than 90% protection) and a very high coverage (say more than 90% of the population being immunized) to suppress the transmission. The former condition depends on the advancement of bio-medical technology. The latter is a social problem. There is poor coverage for a similar airborne disease, measles. Measles outbreaks occur periodically and kill many people worldwide.

Regardless of these limitations, the level of demand for such vaccines is very high while the supply is not yet known to be possible. In Thailand, there are a few vaccine development groups. Using a shortcut technology 'm-RNA', the conditional series of answers (can ask the next questions and carry on the next step of research only when the answer to the current question is satisfactory) are expected to arrive much sooner than the conventional vaccine development can do. The initial answers are that this vaccine produces high levels of antibody in mice and monkeys.

The safety test for a small group of human volunteers (Phase I) is underway. If this initial safety satisfies the reviewing scientists (Data Safety Monitoring Board), a larger group of volunteers will undergo the same safety trial (Phase II). The results will not be known before the end of 2021. Then a more difficult question (Phase III) is waiting, whether the vaccine can really prevent the vaccinee from getting the disease if he/she contacts the virus. This needs a large number of participants who are at high risk in the high incidence area, which cannot be Thailand if the incidence is well contained as it has been. The Thai vaccine development can end at any stage. Its pace of development and testing is not comparable with those done in more developed countries. Yet it is a very admirable effort. So, Thailand still definitely requires access to global vaccines, not necessarily made in Thailand.

We will end this discussion with the issue of access to the desirable vaccine if it is available in the market. Billions of the world population need effective and safe vaccines. There are mixed motivations for this development and production: human security and profits. If one or more vaccines could be developed and show sufficient safety and efficacy, and the ideology of human security wins, the technology can be transferred to all rich and some middle income countries to have their own production to serve the needs of their countries. In this case, Thailand will be a good candidate to be the transferee and a regional point of production to serve the regional needs. If the ideology loses and does not win in time, there will be more deaths and political chaos, which is an uncommon consequence of this pandemic. Thailand therefore has to properly position and steer itself in this troubled water.

For the first three quarters 2020, Thailand has joined some of the countries to prove that this deadly COVID-19 can be defeated by simple knowhow, people participation and good leadership without the need to wait for the dramatic vaccine. Yet the pandemic is a global issue which no country can escape. This uncommon pandemic, like many other disasters, arrived swiftly and caused intense global damage and will have its effects for years. Human beings, however, can adapt and learn how to cope with it and eventually overcome most of the problems. It is too early to see how and how well Thailand can recover from this crisis and stand up again to regain its well being. This document only touches a few facets of the problems faced and lessons learned. More issues and new developments should be sought from further participation in discussion with relevant people in the 2021 Prince Mahidol Award Conference.

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2020-9-14.