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Government and public health measures in response to COVID-19 pandemic and impacts on fisheries and aquaculture in Thailand

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1. Introduction

Coronavirus disease or COVID-19 was first discovered in Wuhan, Hubei Province, China, in December 2019. It is a severe contagious disease caused by a novel SARS-CoV-2. Pending about 1 year without an effective vaccine, then COVID-19 still expanding risk to the world population. The major high-risk cluster to get directly impacted by COVID-19 are those staffs who came in contact with worldwide customers at the immigration securities (Sriwijitalai & Wiwanitkit, 2020; Sheng, 2020). For instance, in Samut Sakhon Province, Thailand, migrant workers from Burma are the main high-risk group. They worked in close contact with others in the seafood processing and preservation sectors.

Even though most individuals infected with COVID-19 have mild to moderate respiratory symptoms, certain groups and individuals, particularly the elderly and those with preexisting situations such as heart syndrome, diabetes, chronic breathing disease, and sarcoma, are at a high risk of severe illnesses and deaths (Guo et al., 2020; Zheng et al., 2020). Albeit with these
vulnerabilities, Thailand, a country with approximately 70 million, has successfully addressed this contagious disease, with only 3977 confirmed COVID-19 cases (Fig. 22.1) and 60 people died from the disease (WHO, 2020a). By early May 2020, the nation could curb the epidemic with solely limited local transmission.

2. Village health volunteers in Thailand

The village health volunteers (VHVs) in Thailand contributed to the disease control (Tejativaddhana et al., 2020). They were well screened and accepted by their value of common interests, generosity, and service mind (Jewjinda & Chalermnirundorn, 2018). They must have an impact and effective health communication and be able to employ powerful health messages. They play an important role in empowering people and their community to mitigate the disease while assisting the health sector in reducing the burden of hospitalization of the patients. Thus, VHVs have contributed significantly to the effective mitigation of COVID-19 in Thailand. They have played a crucial action in disease control and prevention since its official commencement in 1977 as part of a primary health-care system to raise awareness and encourage community participation.

There are more than 1 million VHVs nationwide, and each is in charge of approximately 10 households. This unique structure of the Thai health system is believed to have provided a basis for the effective management of the COVID-19 outbreak. Working closely with tambon or subdistrict health personnel during the pandemic, VHVs have helped monitor people moving in and out of their community and performed regular home visits to monitor their health status. Abnormal symptoms with contact tracing provided the general public with updated information on the outbreak and disease control measures and encouraged
community members to comply with disease control measures such as self-isolation, physical distancing, and mask wearing (Siriluk, 2020).

Through this involvement, VHV and some migrant health volunteers (MHVs) have contributed significantly to Thailand’s success of COVID-19 pandemic management in general. Their contributions toward disease control, especially in fisheries and aquaculture industries, in which Thais and migrant workers are employed, may be unique and merit further discussion.

3. COVID-19 communication and translation

Knowledge communication and translation are the processes by which evidence acquired from research is appropriately used to guide the work of policymakers and practitioners and the future work of researchers (CIHR, 2007). Knowledge translation as a nonlinear process (Fig. 22.2) plays an essential function at each stage of a research initiative, from its design to the communication of findings (Islam et al., 2020).

In COVID-19 and the health sector, if practices not based on the most updated and proven research can have life-threatening consequences. In the social platform, programming can have a tremendously positive impact on the health, education, and livelihoods of vulnerable and marginalized populations worldwide, which is why it is crucial to leverage knowledge and evidence generated through research grounded in the perspective of users to inform

![FIGURE 22.2 Knowledge translation framework as nonlinear process. Modified from Canadian Institutes of Health Research. CIHR. (2007). Knowledge translation [KT] within the research cycle chart. Ottawa, Ontario: Canadian Institutes of Health Research. Retrieved from http://www.cihr-irsc.gc.ca/e/29418.html.]

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these activities (Devine et al., 2020). Thailand should provide periodic and continuous training programs on knowledge translation to increase health volunteer’s knowledge and skills during the COVID-19 pandemic to provide care for the patients (Karuhadej et al., 2019). Moreover, impact communication is an important measure to control the infodemic (Chatterjee et al., 2020) during this era.

4. COVID-19 impact on fisheries sector

COVID-19 pandemic adversely impacts the agricultural and nonagricultural sectors for both industrial and service sectors. It’s not significantly hit only tourism, hospitality, and construction, but also food production sectors, including fisheries and aquaculture. The World Health Organization (WHO) has accepted Thailand for a successful response to the spread of the COVID-19 outbreak; it causes a decrease in the gross domestic product (GDP) by 1.80% in the first quarter of 2020, and sharply declining to 12.10% in the second quarter of 2020 (NESDC, 2020)—resulting in a high number of unemployment (750,000 people) and household debt of 13.59 million baht. This economic burden is mainly caused by the reduction of foreign tourists, especially after April 4, 2020. International flights have been temporarily not allowed to enter Thailand, influencing the reduction of food demand, especially fisheries production (SEAFDEC, 2020).

In addition, another cause of the declined GDP is the reduction of exported value due to the economic recession of partner nations and the broken supply chain of production, especially agricultural products. In the first 8 months of 2019 and 2020, Thailand exported agricultural products by 860,822 and 818,014 million baht, respectively (MoC, 2020). Considering on fishery sector, the exported value of fresh and frozen fisheries in 2020 declined by around 13% from 2019 (MoC, 2020). Likewise, considering only shrimp (Litopenaeus vannamei and Penaeus monodon) production comparing the first 8 months of 2019 and 2020, the exported value also decreased by around 13% (DoF, 2020). Therefore, COVID-19 significantly affects fisheries and aquaculture in Thailand. The ongoing pandemic has been high, affecting the fish supply chain, with jobs and income (OECD, 2020), especially small-scale aquaculture producers and artisanal fishers. They have to sell their fish or shrimp to intermediaries, at low prices, due to a drop in demand. Although local fishers can capture fish for eating and selling, their low income caused by COVID-19 makes their livelihood difficult.

The capture and aquaculture sector supports the livelihood of fisheries communities in Thailand, particularly those involved in small-scale fisheries. FAO (2019) reported in 2018, the total capture fisheries and aquaculture production in Thailand were 1,727,179 and 890,864 metric tons, respectively (Fig. 22.3). The emergence and spread of this pandemic severely disrupt market demand and supply chains of seafood industries (Waiho et al., 2020).

5. Positive impact of COVID-19

However, Dechsup et al. (2020) reported that the COVID-19 outbreak in Thailand has also positively impacted natural resources and the environment to increase fish population due to less human disturbance in the aquatic environment. During the lockdown, the government
requests the people must stay within their residents. The anthropogenic activities include socioeconomic, logistic, industrial, and urbanization movement suddenly switch off, give time to environment to take benefit and displayed improvement in soil quality, less water pollution, fresh air, rich in biodiversity (Arora et al., 2020; Rume & Islam, 2020).

This evidence showed that the pandemic phenomena significantly increases air quality in different cities across the world, reduces GHGs emissions, lessens water contamination and noise pollution, and reduces the stress on the tourist destinations, which may contribute with the restoration and rehabilitation of the ecosystem (Rume & Islam, 2020).

6. Risk management and governance decisions on COVID-19 at national level

At the peak of the pandemic on March 27, 2020 (Fig. 22.1), the government declared a state of emergency and in the following week a nationwide curfew was imposed to bar people from leaving their premises between 10 p.m. and 4 a.m. To reduce the movement of people, travel restrictions both nationally and internationally were also enforced with self-quarantine and self-isolation needed for those traveling from high-risk areas. In addition, all entertainment and sports venues were closed and educational institutions were asked to postpone the start of the semester until the situation was improved (Siriluk, 2020). By early May 2020, the nation was able to curb the first wave of the pandemic with solely limited local transmission, with only 3977 confirmed COVID-19 cases and 60 deaths from the disease over the period of 11 months (WHO, 2020a).

Between December 2020 and April 2021, Thailand entered the second wave of COVID-19 pandemic. This time the new cases of COVID-19 originated from a large seafood market near Bangkok and the outbreak most severely affected clusters of hundreds of foreign workers in Samut Sakhon, one of the main provinces driving Thailand’s fishing industry. Community isolation of these clustered foreign workers was employed, with firm restriction on traveling

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in and out of the affected areas and communities. Related markets and businesses were also closed. Some limited local transmissions including a small number of new COVID-19 cases also started to arise in different areas across the nation. The federal government through its CCSA implemented area-based risk stratification to divide provinces into five categories according to their levels of pandemic risk and severity, which has been used to inform disease control and mitigation measures as well as travel restriction. To account for local differences in infrastructure and context of disease control, the federal government transferred authority and responsibility in disease control to the local governments and urged the local governments to implement stricter disease control measures if necessary. There was no nationwide lockdown or curfew. A so-called DMHTTA approach was strongly encouraged as preventive measures for individuals—D: Physical distancing, M: Mask wearing, H: Hand washing regularly, T: Temperature taken when entering public venues and facilities, T: Testing for COVID when appropriate, and A: Online Application to monitor individual’s risk and traveling (MoP, 2021).

From April to July 2021, Thailand apparently encountered the third wave of the pandemic with the number of new cases and deaths spiraling. The number of confirmed new cases per day rose from hundreds in April to more than 10 thousands in the second half of July 2021, making the toll of 543,361 confirmed cases (Fig. 22.4) and 4397 deaths as of July 28, 2021 (DDC, 2021; WHO, 2020a).

The majority of new cases arose from construction sites in Bangkok and neighboring provinces, which became the most severely hit areas during the early phase of this third wave. Main construction sites and factories in Bangkok were shut down and strict quarantine and isolation of people living in these construction sites were enforced. Albeit these disease control measures, many construction and factory workers inevitably traveled back to their hometowns, mostly in northeastern Thailand. The movement of these construction workers and relatives, many of which were believed to be already contracted with the coronavirus, led to a great increase in daily new cases of COVID-19 in many provinces.

![Thailand COVID-19 Situation](image)

**FIGURE 22.4** Epidemic curve of COVID-19 cases in Thailand since January 12, 2020, when the first case was reported to update on July 28, 2021, with 543,361 confirmed cases.
Nationwide, the government urged all government and private sectors to support work-from-home practice, enforced restriction on operating time for markets and public transport, allowed solely supermarket selling food and drink, pharmacy, banking, and vaccination venue to operate, implemented no-sitting-in-restaurants policy, restricted time for public parks, closed entertainment and sport venues, and banned public gathering of more than five people (DDC, 2021). All domestic flights from and to highest and strict control areas were temporally barred. For Bangkok and other nine severely hit provinces, stricter disease control measures were implemented, including a lockdown and curfew starting on July 12, 2021, to restrict people to leaving their premises between 9 p.m. and 4 a.m. After the announcement of the lockdown and curfew measures in these highest and strict control areas, the government considered measures to provide compensation to people in the 10 provinces (DDC, 2021). The government continued to urge people to strictly follow the DMHTTA preventive measures.

7. Recommendation for preventing COVID-19

According to the Joint Intra-Action Review conducted by the Ministry of Public Health and the WHO (WHO, 2020b), critical factors for successful management of the COVID-19 pandemic in Thailand span from strong leadership informed by the best scientific evidence, early and prompt action to the outbreak, cultural norms, effective public communication, to strong and well-structured medical and public health systems (Box 22.1).

BOX 22.1

Factors contributing to successful management of COVID-19 pandemic in Thailand according to the joint intra-action review conducted by the Ministry of Public Health and the World Health Organization (WHO, 2020b)

- Strong leadership with knowledge translation by the best research evidence-based
- Governmental systems adapted to evolving problems and needs
- A strong, well-resourced, and inclusive medical and public health system
- Previous experience with major infectious disease outbreaks including SARS, avian influenza, and influenza H1N1
- Starting entry screening early led to detection of the first case outside China. This allowed authorities to educate hospital and public health workers, VHV’s, and members of the public to the threat
- Social norms including noncontact greeting and mask wearing, supported by consistent and transparent communication improved public compliance with protective measures
- Early adoption of a “whole of society” method included active engagement with university and the private sector
In addition, at the Fourth Industrial Revolution era, understanding the spatiotemporal variations of COVID-19 using information technology is important for its mitigation, as it helps to elucidate the extent and impact of the pandemic, planning, and community action (Franch-Pardo et al., 2020). The thematic mapping of COVID-19 density visualizing at mobile phone unit helps many stakeholders, including VHV and MHVs, identify cases and aid decision-making.

At the practical level, spatial analysis procedures for big data are in ascendancy. For example, GIS has developed and matured relatively quickly for health data preparation, platform construction, medical model construction, and map production. However, the main challenge for the struggle against COVID-19 is improving speed and precision to provide accurate information for prompt disease control and management. Currently and for a long time in the future, the advance of GIS technology should be strengthened to form a data-driven system for rapid knowledge acquisition (Sugg et al., 2021; Zhou et al., 2020).

Although economic measures have provided through several projects for alleviating the impacts of the pandemic by injection of huge of money of 365,658 million baht, covering around 43 million people (LAC, 2020), resulting in Thailand economy now gradually recovering from the lowest point of the second quarter of 2020. Although many measures implemented and the COVID-19 vaccine activated for ending COVID-19 pandemic, during incoming 1–2 years, Thai economy cannot depend on export, like many years before the pandemic happened. To mitigate COVID-19 impacts on the fishery sector, the government should consider promoting agricultural youths or workers in industry or service sectors to become innovative farmers, promoting precision aquaculture farming, enhancing small farmer’s skills in cost management together with using technologies for farming management such as GIS and remote sensing, and extending fishery product to the processing industry. The occupation promotion and skill development must be prepared for domestic production; particularly, the fishery sector using Bio-Circular-Green Economic (BCG) model is recommended.

8. Conclusion

This study finds the impact of COVID-19 on fisheries sector in Thailand including reduction of domestic and world market demands, and fluctuation of the seafood supply chains which generated stress and livelihood disruptions. Thus, many workers return to their villages. Local government units and VHV consult closely with patients in their responsible area. VHV is a key driver in COVID-19 disease control and prevention in Thailand. We recommended that optimum incentives from the government need to be provided directly to VHV for supporting their daily activities. Capacity and resilience building on COVID-19 communication skill associated with knowledge research translation for VHVs are needed. Moreover, COVID-19 infected cases should be annotated as spatial–temporal dynamics using geospatial information and display in the Internet. We also discussed positive points of COVID-19 that on the other hand they improve global environment due to lessen GHGs emission, water, industrial, and noise pollution.
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