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"Pineapple eyes": local social networks to prevent and control epidemics in Thailand's southern beach tourism provinces

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ABSTRACT

The study aimed to qualitatively examine epidemic prevention and control processes in beach tourism provinces in the upper southern region of Thailand, as well as investigate networks related to public health emergency management (PHEM) during such epidemics. The findings highlighted key elements of PHEM for emerging infectious diseases. This involved initial assessments of epidemics and health conditions, categorizing the population by risk, and performing prognosis. Subsequently, operational guidelines for prevention, disease control, and treatment were proposed and often submitted for consideration and orders to the provincial communicable disease control committee. Meetings were held to disseminate committee announcements and measures for implementation by relevant departments, enhancing operational guideline development. Successful local networks as pineapple eyes for PHEM in response to emerging infectious diseases were characterized by robust social networks and informal cooperation at village and community levels, serving as crucial mechanisms for disease control and care. Additionally, business sector networks transformed "mutual suffering" into cooperation, with entrepreneurs in the tourism industry taking the lead. They developed various websites and applications at different stages to promote and support situation management, proving to be a vital mechanism for an effective response to emerging infectious diseases.

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1. INTRODUCTION

The recently public health emergency: COVID-19 is a pandemic affecting humanity. Various strains of coronavirus cause respiratory diseases, including the common cold to more severe ones, such as middle east respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS). On March 2020, the World Health Organization (WHO) declared the Corona Virus Diseases 2019 (COVID-19) a global pandemic COVID-19 was declared a global pandemic [1], [2]. The outbreak was found in Thailand December 31, 2020. The center for COVID-19 situation administration (CCSA) reported 194 new cases and 181 cases were domestic cases and 13 cases were found in state quarantine, totaling 6,884 confirmed cases. Altogether 4,869 domestically cases and 61 cumulative deaths were reported. Until 2022, in Thailand, 2,441,726 cumulative cases and 11,073 deaths were confirmed. Several studies have concluded that the cause of not ending the COVID-19 pandemic is a factor in people's behavior that does not comply with social isolation [3], [4] and

determinants of community behavior, among others, are due to low perceptions about social isolation to prevent COVID-19 transmission [5], [6].

The COVID-19 pandemic has had severe economic impacts worldwide, including changes in ways of doing business and consumer behavior [7]. The outbreak of COVID-19 has greatly affected Thailand's economy as Thailand's tourism revenue has decreased. According to data from United Nations World Tourism Organization (UNWTO) in 2017, Thailand was ranked 4th among countries with the highest revenue from foreign tourists in the world [8]. Consequently, the accumulated number of foreign tourists traveling to Thailand between January and December 2020 was 6.7 million people. It decreased from the same period in 2019, which was about 39.9 million people, or an 83% decrease as well as domestic tourism by Thais (the project for Thais to travel in Thailand) decreased by 30.77%, resulting in greatly decreased revenue from foreign tourists. From January to December 2020, the revenue from foreign tourists totaled 332,013 million baht. It decreased from the same period in 2019, which was 1,911,808 million baht by 82.6% [9]. However, beach tourism provinces in Thailand, especially Phuket, Krabi and Surat Thani as the top ten provinces, could still generate the highest tourism revenue for Thailand in 2022 [10].

The National Health Act of 2007 (B.E. 2550) represents a pivotal moment in Thailand's healthcare system, driving it towards its goals by expanding beyond the realms of medicine and public health and opening up space for participation from all sectors of society (All for Health) to achieve health for all. To develop public health policies effectively, it relies on a diverse network of stakeholders, from local communities to provinces all the way up to the national level. Community health networks play a vital role in the development and maintenance of community and population health within the same geographical areas. They promote, develop, and upgrade community health systems tailored to each community's context. The importance of community health networks, based on various sources, includes: i) health promotion: community health networks support health maintenance and disease prevention in communities by providing guidance on proper healthcare and supporting local health activities, ii) information dissemination: community health networks serve as critical sources of health-related information, helping populations stay informed about new health developments and medical service access information. They also provide information on disease prevention and treatment, iii) advocacy for rights and equality: these networks can assist in advocating for health rights and equality in accessing healthcare services by voicing the special needs of certain groups and encouraging community members' participation and involvement, iv) emergency preparedness: community health networks have a role in preparing for health emergencies, such as disease outbreaks. They help in managing emergency situations, training first responders, and preparing for health crises, and v) building community connections and relationships: community health networks help establish strong connections and relationships within communities, fostering the exchange of knowledge and experiences. They strengthen community health resilience.

Community health networks are crucial for developing and improving community health by efficiently promoting health and ensuring equitable access to healthcare services. They play a key role in ongoing and sustainable healthcare development because all members of the network have important roles in working together toward the shared goal of community health. This involves communication, knowledge exchange, and collaboration in various aspects, including data collection, problem diagnosis, planning, implementation, and evaluation. Everyone in the network shares a sense of collective responsibility, working together to achieve the common aim of community health. Therefore, building community health networks is a key factor in ensuring the continuous and robust progress of Thailand's healthcare system.

There were consistently a lot of patients in phase 1 of spreading. The effective COVID-19 management recommendations in beach tourism provinces in the upper southern region can minimize the lowest rate of patients. Thus, businesses and lives recovered in a short time. As the success of Thailand's COVID-19 disease control during the first wave, the success of disease prevention and control operations of various agencies at the local level was important for preparing to deal with the outbreak of new emerging diseases in the future which are expected to occur. Moreover, learning from the experience to develop a work system is necessary to maximize efficiency and effectiveness.

This research aimed to study the process of prevention and control of epidemic in beach tourism provinces in the upper southern region and to learn networks on public health emergency situation management in the case of epidemic in beach tourism provinces in the upper southern region. The research team applied system theory [11] as a framework for studying public health emergency situation management in coping with the emerging infectious diseases, including inputs and outputs which are summarized as the conceptual framework as shown in Figure 1.

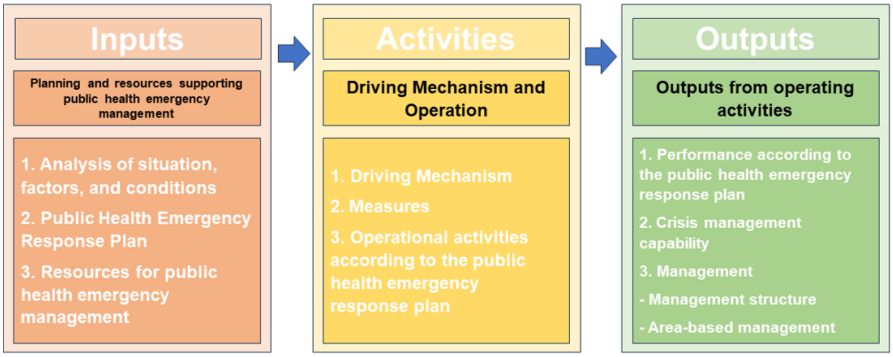

Figure 1. Conceptual framework

2. METHOD

This study incorporated methods of conducting research as described following.

2.1. Research design

This research is qualitative by applying a mixed-data collection technique. This research was certified for research ethics by the Human Research Ethics Committee, Department of Medical Sciences. The researcher complied with ethics considerations and guidelines for ethical research among human subjects.

2.2. Population

The target population were all stakeholders related to epidemic prevention and control in Thailand's southern beach tourism provinces. This study chose participants from Phuket, Krabi, and Surat Thani, including operational leaders, practitioners at the provincial, district, and sub-district levels, and public health volunteers working to prevent and control disease in the community. All participants must voluntarily participate in this research.

2.3. Area of study

This research focuses on the beach tourism provinces in the upper southern region of Thailand. Three beach tourism provinces in included Phuket, Krabi, and Surat Thani. All areas were informed participants providing willing consent in the study.

2.4. Research participants

Altogether 171 participants joined the research. Participants signed an informed consent form. The subsequent criteria for inclusion in purposive sampling i) in-depth interview: the team of policymakers or administrators responding to and managing public health emergencies includes provincial governors or representatives who have a commanding role. The 6 persons in total, 2 per province; 3 provinces are designated as Provincial Public Health Medical Doctors or Provincial Public Health Office representatives, ii) focus group: disease prevention and control personnel from provincial-level service units and hospitals seven people from 3 provinces, 21 people in total, iii) focus group: Staff at the district and sub-district levels, including disease prevention and control personnel, as well as staff at sub-district health-promoting hospitals and district hospitals in the areas where the epidemic broke out, with 40 people in each province and 120 people in three provinces, iv) focus group: village health volunteers In areas where disease outbreaks occur, there are eight people per province, 3 provinces, for a total of 24 people.

2.5. Data collection

All questions are Thai language and were validated by the expert of Ministry of Public Health of Thailand. The Qualitative research Data Collection Process: The scopes of the qualitative data collection consisted of the following.

- Operational processes included defining the operational guidelines, choosing the operational guidelines, announcing measures or policy formulation, implementing guidelines, measures or policies, and evaluating operational guidelines.
- Conditional factors included success, problems, strategies, and failures.
- People involved in the operational processes and roles of network partners included supporting the operations

- Impacts included those from operations that affect affecting or result resulting in changes in communities or people
- Data collection methods are as follows described as:
  a) In-depth interviews were employed among policy makers or executives for public health emergency situation management in the case of COVID-19 in the target provinces, including provincial governors or authorized representatives, provincial public health physicians or authorized representatives, with 2 people per province, totalling 6 people through selected using purposive sampling.
  b) Lessons discovered were performed extracted on from provincial personnel through using focus group discussions among workers in COVID-19 disease prevention and control and healthcare workers in provincial service units and provincial hospitals with totalling 77 people per province, 21 people through selected using purposive sampling.
  c) Lessons discovered were performed extracted on from practitioners at the district and sub-district levels through focus group discussions among disease prevention and control workers and workers in sub-district health promoting hospitals, district public health units, and district hospitals with a COVID-19 outbreak, with 40 people per province, totalling 120 people through selected using purposive sampling.
  d) Lessons discovered were performed extracted by using focus group discussions among village health volunteers in areas with the outbreak of COVID-19 outbreak, with eight people per province, totalling 24 people through selected using purposive sampling.

2.6. Research instrument

Research instruments used consisted of the following.

- Project summary documents included meeting reports, instructions, photos of activities, stories or evidence as documents, audio files, electronic documents, and data related to COVID-19 disease prevention and control operations of provinces.
- In-depth interviews consisted of semi-structured questions developed by the researchers. The consistency and content validity were checked by public health specialists and qualitative researchers in the social sciences or medicine, IOC score of 1.00.
- Focus group discussions consisted of a semi-structured questions developed by researchers. The consistency and content validity were checked by public health specialists and qualitative researchers in the social sciences or medicine, IOC score of 1.00.

2.7. Data analysis

For qualitative data analysis, critical theory was applied as a data analysis theory together with the public policy model defined by the researchers as a temporary conceptual framework and a guideline for data analysis. Qualitative analysis based on in-depth interview questions was divided in two parts. For the first part, descriptive statements from in-depth interviews were analyzed using analytical principles, consisting of three types: analytic induction, typologic analysis with theoretical and nontheoretical methods as a framework for interpretation and constant comparison. For the second part, content analysis was employed to draw conclusions.

As for content analysis to find conclusions, detailed data, and records were collected and categorized systematically to analyze and process the data in concepts and patterns of relationships. The obtained data were interpreted and conclusions were drawn to present the results of the analysis in the form of a descriptive arrangement with the issue summary according to the objectives of the research. Common characteristics were found and keywords were chosen to process ideas from the summarized data in theoretical conclusions.

3. RESULTS AND DISCUSSION

3.1. Public health emergency situation management processes in response to epidemics in beach tourism provinces in the upper southern region

The accumulated number of patients was only 288 per 3,475,122 people, or the rate of patients was 0.000083 in beach tourism provinces in the upper southern region during the first wave from January 31, 2020, to March 31, 2021. While the accumulated number of patients in Thailand was 1,920,189 out of 71.6 million populations, the rate of patients was 0.026818. As a result, it was superior to Thailand overall. Province's Communicated Disease Control Committee, including situation evaluation, execution, and outputs or results, which are summarized as the conceptual framework as shown in Figure 2.

Public health emergency management (PHEM) processes in beach tourism provinces in the upper southern region were illustrated in an overview with an analysis based on PHEM with four main operational components, commonly known as 2P2R, namely, P1: Prevention and Mitigation, P2: Preparedness, R1: Response and R2: Recovery [12].

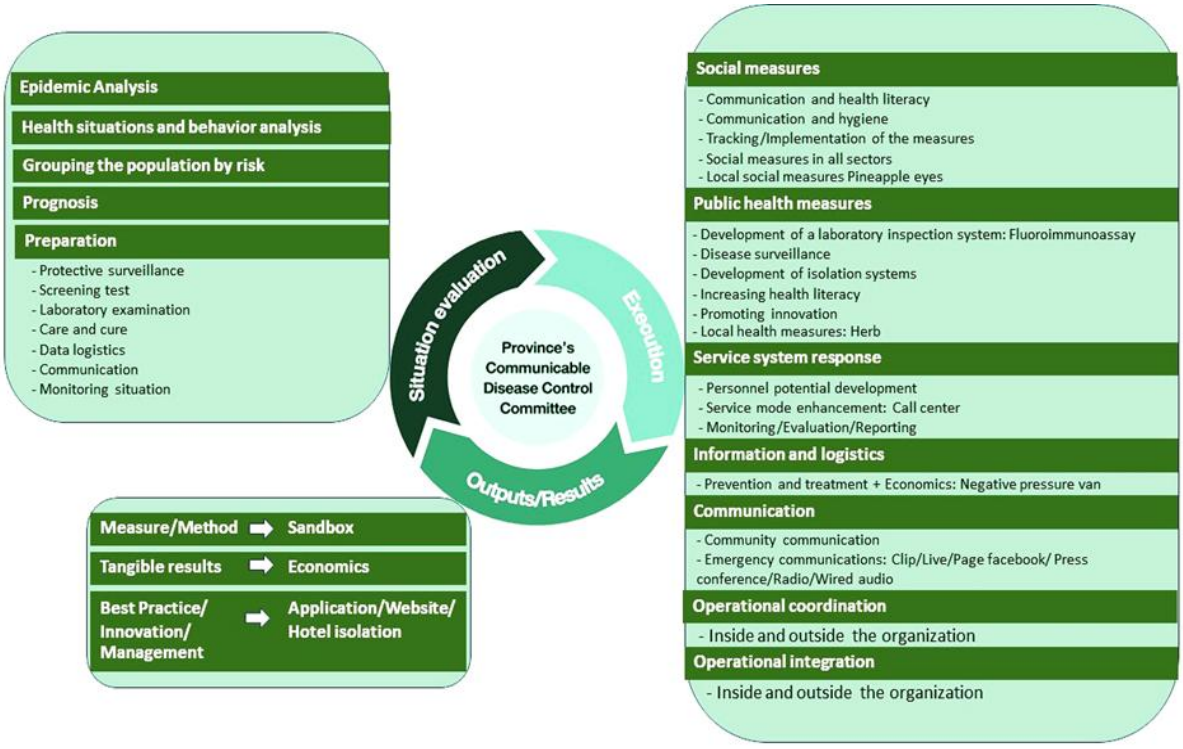

Figure 2. Public health emergency situation management processes in response to COVID-19 epidemics in Sea beach tourism provinces in the Upper Southern Region of Thailand

P1: Prevention: For surveillance, prevention and mitigation, beach tourism provinces in the upper southern region implemented social measures to create an understanding of health, practices, infection prevention guidelines, and how to deal with fake news as well as developing operational measures, tracking systems and participation from all sectors through various operations including meeting the provincial communicable disease committee, communicating via Facebook Live, communicating with the public through the call centers and the Official Line, establishing a local quarantine to observe the onset of illness, setting up a field hospital, and creating community isolation, a hospital and home isolation.

P2: Preparedness: For preparation in beach tourism provinces in the upper southern region, because they are tourism provinces with the flow of foreign tourists constantly entering the areas, cases were found shortly after the outbreak in China. Consequently, some areas may not be ready in some aspects. However, as a whole, it could be seen that preparations were made for the important and necessary information to deal with the epidemic, preparing for prevention, screening, and treatment; preparing for medical support and delivery, technology and information equipment, and equipment and communication systems. Survival bags were also prepared as well as vehicles for transporting patients and operation centers. This included vaccination in preparation for dealing with potential disease situations. Beach tourism provinces in the upper southern region prepared the necessary information along with preparations for prevention, screening, and treatment.

R1: Response: Public health response measures in beach tourism provinces in the upper southern region employed various measures to manage the situation in the area as detailed following:

– Disease control development: Disease control development was mainly managed by the communicable disease control unit (CDCU) including follow-up, surveillance and disease investigation, isolation, quarantine, area lockdown, the promotion of knowledge of disease control, and the use of innovation and technology in disease control and surveillance. Guidelines and experience in disease control and management were used from disaster situations that had been successfully applied, such as guidelines for controlling MERS and for managing tsunami disasters by conducting surveillance, monitoring, and investigation of the disease, isolation, quarantine, area lockdown, the promotion of knowledge of disease control and the use of innovation and technology in disease control and surveillance.

- Treatment: Public health response measures in developing patient care systems included setting up or improving the acute respiratory illness clinic (ARI), the emergency room (ER), cohort wards or control unit (CU), equipment for care and the healthcare service systems in the main government hospitals, field hospitals, the hotel isolation (HI), the outpatient with self isolation (OPSI), the community isolation (CI), and the factory accommodation isolation (FAI) using case monitoring and applying innovation and technology. This included a network of personnel in the public and private sectors, volunteers, and herbal medicine treatment.
- Service: Public health response measures in developing services included developing the competencies of medical and public health personnel, adjusting various service models, such as screening and detention centers, inside and outside the hospitals under the new normal approach by educating personnel and adjusting the services.
- Coordination and Integration: Public health response measures in developing coordination and integration included setting up integrated teams including the Department of Interior and the Department of Medicine and Public Health to manage disease prevention and control, and establish the HI, the OPSI, the CI and the FAI.

R2: Recovery: Recovery efforts included measures to accelerate the number of vaccinated people so that a business could be opened to restore and stimulate the economy and society could return to normal conditions as soon as possible. Beach tourism provinces in the upper southern region had various guidelines including educating, campaigning, and organizing activities to promote vaccination.

To sum up, the public health emergency situation management in dealing with the emerging infectious diseases in the provinces in beach tourism provinces in the upper southern region conducted the operations as described.

1) Situation assessment: operations in the situation assessment consisted of two steps discussed as:
   - Epidemic situation analysis: The provincial communicable disease committee used information concerning the outbreak situation from the global, continental neighboring country, national and provincial levels, and nearby province situations to analyze the epidemic situation with prognosis. This led to formulating three measures to prepare for the outbreak, including i) public health measures to prevent disease from emerging through various approaches for control and prevention, ii) medical measures as guidelines for treating positive patients including asymptomatic patients and patients with mild and severe symptoms and iii) social measures for all people to protect themselves from the disease. Listed below are guidelines supporting the implementation of public health measures with all parties' efforts for continuous compliance.
   - Health situation and behavior analysis: The health situation and behavior of the people in the area were analyzed together with the analysis of the various measures carried out to consider operational measures consistent with the local context.
   - Grouping by risk: local populations were grouped according to their level of risk for educating them and performing special surveillance among extremely high-risk groups.
   - Prognosis: In some areas, epidemiologic data at all levels were used for prognosis to prepare measures.
   - Preparedness: In the study area of beach tourism provinces in the upper southern region, people involved were prepared for operations including surveillance, prevention, screening, lab inspection, maintenance, data logistics, communication and continuously monitoring the situation.
2) Guideline proposal for prevention, disease control and treatment: the practitioners proposed guidelines for prevention, disease control, and treatment to the provincial communicable disease control committee to implement through the board meeting with the provincial governor as commander.
3) Meetings, resolutions, and orders: announcements and measures were issued by the provincial communicable disease control committee for the operations of relevant departments to improve the development of operational guidelines.
4) Implementation: beach tourism provinces in the upper southern region conducted actions are described as.
   - Social measures: social measures were implemented in line with the local context including communication and health literacy (HL), cleanliness, monitoring and complying with measures, determining social measures for all sectors and forming other social measures for specific areas.
   - Public health measures: public health measures were operated in the same direction with the overall picture of the country, but some areas' measures varied, such as developing a laboratory inspection system, monitoring and surveillance of the disease and developing a quarantine system to promote health knowledge and innovation.
   - Service response: service response was operated based on the disease situation by developing personnel potential, improving service and monitoring, evaluating, and reporting results.

- Data and logistics: searched and shared information was easily accessed by personnel including systematic logistics planning for the benefit of prevention, treatment and accelerating economic recovery.
- Communication: communication was used for PHEM in two forms: community and emergency communications. As a result, all stakeholders in all sectors could receive adequate information to effectively perform their roles.
- Cooperation in operations inside and outside the organization: coordinating between agencies and integrating both internal and external operations were made in all dimensions, such as treatment, referral of patients, delivery of medical supplies and consumer goods.

PHEM is an emergent field of practice that draws on specific sets of knowledge, techniques, and organizing principles necessary for the effective management of complex health events [13]. The PHEM processes in response to epidemics in beach tourism provinces in the upper southern region of Thailand will be consistent with COVID-19 readiness, response, recovery cycle and disaster management cycle and COVID-19-Breaking [14], [15]. In addition, PHEM Processes in Response to Epidemics in Beach Tourism Provinces in the Upper Southern Region of Thailand are also consistent with the concept of business continuity management for crises which is an important principle in managing a business in a crisis [16].

The important steps for PHEM processes are as: i) prevention and reduction of impacts, there is an effort to prevent the spread of disease in the area with screening, isolation, and area closure. ii) preparedness for disasters by planning and preparing personnel and resources. iii) emergency management, operations are adjusted to be consistent with the continually changing disease situation and iv) post-disaster management, which creates careers for those affected by the economy. There are important steps that are consistent and integrate the infectious disease management process with business crisis management according to the concept of [17]. And the public health system's disease control mechanisms were examined and it was discovered that the system has designed to respond to health crises [18].

However, A key component of the successful implementation process of PHEM is at intermediate level (e.g., outreach activity development) [19]. And, the success of community engagement is dependent on empowering communities [20], [21].

3.2. Success of PHEM in coping with emerging infectious diseases in Beach Tourism Provinces in the Upper Southern Region

The most effective uses of PHEM in dealing with emerging infectious diseases were synthesized as described in detail as:

3.2.1. Pineapple eyes: Strong local social networks

The informal cooperation network at village and community levels was a core mechanism for the control and supervision of emerging infectious diseases in beach tourism provinces in the upper southern region. Similarly, the majority of Indonesian students received information regarding COVID-19 from social media platforms, which are informal networks [22]. Although the Centre for COVID-19 Situation Administration (CCSA) set guidelines for managing the overall situation, with a specific context, each community altered the management of the situation as well as operations based on the local context. Actual practitioners in the community from many sectors worked closely with the community, including the public health sector, village health volunteers, and public health officers at Thailand's sub-district health-promoting hospitals (SHPH). Supporting the findings in Canada, primary care is the first line in controlling the pandemic at the community level [23]. The administrative sectors included the village headman, the village headman's assistant, and the subdistrict headman. As a result, the situation management guidelines were based on intimacy and the cooperation of people in the community. This resulted in swift communication and coordination between each other without gaps; thus, facilitating the operation of the community network in controlling and supervising epidemics at the village and community levels smoothly and efficiently. Conform to the study in Brazil about increasing awareness by providing guidelines and increasing compliance with health behavior with the implementation of rules [24].

Moreover, cooperation could be extended through private networks of each sector to the public volunteer sector and the entrepreneurial sector in the community to take part in controlling and managing epidemics in the village and community for a wider range. Everyone in the community is considered a member of the Pineapple Eyes Network. In addition to the local residents, the Pineapple Eyes Network also monitors tracks, investigates, and inspects foreigners or tourists. Since tourists are considered outsiders in the community, members of the Pineapple Eyes Network keep a watchful eye and report any deviations from the guidelines of the Ministry of Public Health, no matter how minor. This immediate reporting through group messaging allows for timely control and supervision, preventing the spread of any potential outbreaks. As a result, the emergency management of the southern coastal tourist areas of Thailand is carried out efficiently

and effectively, yielding positive results. According to the report in Hawaii, understanding social networks and digital health sources among young people is important for designing effective health communications to reach all communities [25]. However, beach tourism areas comprised urban areas with many housing estates. The cooperation network at the village and community levels could not access some housing estates.

3.2.2. Robust collaboration from entrepreneurs

Businesses involved in tourism and commerce shut down during epidemics, which had an impact on society and the economy, especially the tourism industry, which was the number 1 business in Thailand for generating income. This constitutes one significant reason for the tourism industry to take part in managing the situation due to the demand to resolve the situation and return to open businesses. The tourism industry's human resources preferred to help solve problems resulting from emerging infectious diseases to mitigate the negative consequences. As a result, they fund all the assistance and imperative resources required to swiftly put an end to the epidemics. An entrepreneurs' network of technology cooperation in the area promoted and supported PHEM in dealing with emerging infectious diseases in beach tourism provinces in the upper southern region with effectiveness because many entrepreneurs in the tourism industry were well prepared in terms of technology and personnel. Their potential is presented through the development of various websites and applications promoting and supporting situation management in many stages as a crucial mechanism enabling effective responses to emerging infectious diseases. During the outbreak, entrepreneurs' networks provided and facilitated private places for public vaccine injections without incurring expenses, with extensive cooperation for bubble and seal measures to limit spreading. They regularly donated consumer goods to the unemployed and sufferers. Furthermore, entrepreneurs' networks also subsidized budgets to assist local government organizations, district volunteers, and the native population in preventing, controlling, living, and recovering. "Sandbox" is a well-known method created by business sectors that helps strike a balance between disease control and the tourism business. It was effective, which affected mental and emotional states, resulting in mindfulness. All of this support helps the public health staff and sufferers have a better spirit to go through tough epidemic situations. Collaboration in efficient PHEM was the biggest accomplishment.

The social network and cooperation of entrepreneurs in the area for PHEM in coping with emerging infectious diseases in beach tourism provinces in the upper southern region can be considered an important element of five core components of COVID-19 preparedness, readiness and response include: i) emergency coordination; ii) collaborative surveillance; iii) community protection; iv) safe and scalable care; and v) access to countermeasures [26]. Relevant to factors that influence preventive knowledge of COVID-19 in United States. Higher education, occupation, and educational/occupational background are the influencing factors [27]. And according to risk communication is effectively delivered to the population before and in case of a local outbreak, as well as to strengthen the early response to prevent COVID-19 outbreaks and other emerging infectious diseases in the future [28]. It is consistent with increased mobility in residential or stay-at-home settings was strongly correlated with the reduction of COVID-19 spread [29].

Social networks will affect credible, trusted, relevant, timely, accessible and actionable health information which is crucial [26]. Social networks, including the cooperation of entrepreneurs, are an important force in managing the COVID-19 epidemic situation for beach tourism provinces in the upper southern region because the partners identified several facilitators and barriers to rapid implementation of the alliance, identified beneficial outcomes, and highlighted important recommendations for addressing urgent and chronic public health needs facing vulnerable populations statewide [30]. Knowledge is one of the factors that encourages public participation to prevent the transmission of COVID-19. The knowledge aspect assessed is the disease (knowing the COVID-19 pandemic), modes of transmission, common symptoms, and prevention of transmission. Preventive behavior is an essential aspect of community participation efforts to reduce transmission during the COVID-19 pandemic. Preventive behavior is also related to the knowledge and attitudes of each community [31]. According to the findings, higher education has a significant association with knowledge and good practices regarding the COVID-19 outbreak in Bangladesh [32]. And related to the findings, people who do not have an occupation, a low perception of self-efficacy, and a low evaluated cost response have poor prevention behavior for COVID-19 [33]. Financial mechanisms developed by the community networks and supported by entrepreneurs have added a critical layer of accessible material resources to the social infrastructure embodied by the community networks [34] and the community networks usually provide assistance from entrepreneurs in the form of flexible financial resources, a general direction or objective, a platform to share practices, tools, and solutions, technical assistance and mentoring by both professionals and experienced community leaders, and an interface with other states, civil society, and private powers. The entrepreneurs's support both harnesses and feeds the strength of the collective power embedded in the community networks. It allows for the recognition and enhancement of existing communities, relations, and dynamics inherent in the social infrastructures of care and solidarity.

Furthermore, network communication within the public health emergency preparedness system is important for increased efficiency and effectiveness of crisis management as well which is consistent with [35]

that was found the communication of network within the public health emergency preparedness system especially the communication with healthcare providers, communication with emergency management, public safety, and other sectors, communication between public health and other sectors to ensure coordination of prevention and treatment efforts and communication with other public health institutions at the global, national, and subnational levels are the core competencies for health emergency preparedness.

The cooperation of community networks affects efforts to reduce transmission. This may be due to preventive behavior, which is an essential aspect of community participation efforts to reduce transmission during the COVID-19 pandemic. Preventive behavior is also related to the knowledge and attitudes of each community. The research of [31] found the three aspects of knowledge, attitude and practice have a positive correlation, thus indicating that adequate public knowledge has a positive impact on attitudes towards preventive measures and behavior towards responses to reduce virus transmission. The results of a good knowledge, attitude, and practice aspect can provide a direct output, namely a reduction in the incidence of COVID-19 in each country over a specific period of time and in the long term.

4. CONCLUSION

The PHEM processes in beach tourism provinces in the upper southern region have demonstrated a comprehensive and effective approach to dealing with emerging infectious diseases. This multi-faceted strategy, which encompasses the four key operational components of 2P2R (prevention and mitigation, preparedness, response, and recovery), has yielded notable success in managing and mitigating the impact of infectious disease outbreaks. Three pivotal success factors have emerged from this approach: i) Strong local social networks ("Pineapple Eyes"): the informal cooperation network at the village and community levels played a pivotal role in the control and supervision of emerging infectious diseases. Close collaboration among various sectors, including the public health sector, village health volunteers, and local administrative authorities, facilitated swift communication and coordination, and this grassroots approach allowed for immediate reporting and timely control measures, even involving tourists, leading to efficient epidemic management; ii) Robust Collaboration from Entrepreneurs: Businesses, particularly those in the tourism industry, are actively engaged in managing the situation due to the economic impact and the desire to reopen. Entrepreneurial networks leveraged their technological capabilities and resources to support PHEM efforts, including the development of websites and applications. Entrepreneurs provided private spaces for vaccinations, donated essential goods, and subsidized budgets for prevention and recovery efforts, and the "Sandbox" method, introduced by the business sector, struck a balance between disease control and the tourism industry, promoting mindfulness and resilience; and iii) Effective public-private partnerships: collaboration between public health authorities and private sector stakeholders, including entrepreneurs, was a hallmark of the success of PHEM and this partnership led to efficient resource allocation, innovative solutions, and rapid responses to emerging infectious diseases.

Overall, the successful implementation of PHEM in the upper southern beach tourism provinces serves as a model for effective emergency management. The combination of community-driven initiatives, private sector engagement, and robust public-private collaboration has not only safeguarded public health but also contributed to the resilience and sustainability of the tourism industry in the region. This experience demonstrates the importance of adaptive, cooperative approaches in addressing complex challenges like infectious disease outbreaks.

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