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The Development of Prevention and Control Operational Model in Emerging Infectious Disease by Area Networks Participation Among Chatturat District Chaiyaphum Province

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ABSTRACT

Background: Emerging infectious diseases are considered public health problems that impact the economy, politics, and society. Disease prevention and control require high-quality cooperation from related agencies and area network partners. This study aimed to develop a model for preventing and controlling emerging infectious diseases through area network participation.

Study Design: Mixed methods research.

Methods: Phase I: The study examined factors influencing the prevention and control of emerging infectious diseases in three groups: 1) 364 COVID-19 risk groups, 2) 252 Surveillance and Rapid Response Team members and area network partners, and 3) 168 Subdistrict Disease Control Operations Center Working Group members. Quantitative data were analyzed using factor analysis, discriminant analysis, and multiple regression. Qualitative data were analyzed through content analysis. Phase II: Development of the model for disease prevention and control. **Results:** The study found that in Group 1, increased knowledge influenced behavior in disease prevention (Mean difference=0.09) and ATK testing (Mean difference=0.34). ATK testing and COVID-19 vaccination were found to be unique to each person (Uniqueness=0.62-0.68). In Group 2, disease prevention and control participation was high (Mean=4.27, SD = 0.69). In Group 3, support from the government sector was at a moderate level (Mean=3.65, SD=1.01), with positive support mainly related to technology (discriminant coefficient=0.06). The critical factors in the development process driving the prevention and control of emerging infectious diseases in the area were operated by the 3P Model: 5 Power, 6 Participation, 7 Proactive.

Conclusion: This study revealed that the 3P model can serve as a guideline for preventing and controlling outbreaks of emerging infectious diseases.

Keywords: Emerging infectious diseases, prevention and control operational model, Model development, 3P Model, Area network partners.

1. INTRODUCTION

Emerging infectious diseases, as defined by the World Health Organization, refer to diseases caused by new pathogens, diseases found in new areas, re-emerging infectious diseases, pathogens resistant to antimicrobial drugs, and intentional human actions with biological agents.[1] Over the past several decades, outbreaks of emerging infectious diseases have occurred worldwide, affecting Thailand as follows: In 2003, there was a severe outbreak of Severe Acute Respiratory Syndrome (SARS) caused by the Coronavirus strain HCOV-229E, which affected 8,098 patients and resulted in 774 deaths. In 2004, an outbreak of avian and other animal-origin Influenza virus infection, with the virus strain H5N1, affected 25 patients and resulted in 17 deaths. In 2009, a new strain of Influenza, type A (H1N1: 2009), affected 30,956 patients and resulted in 157 deaths.[2] Additionally, the ongoing global impact of COVID-19 has been significant, with 530,920,131 cases and 6,309,638 deaths reported worldwide as of May 30, 2022.[3]

Thailand has reported 446,502 cases of COVID-19 and 29,998 deaths. The Department of Disease Control, Ministry of Public Health established an Emergency Operation Center (EOC) on January 4, 2020, in response to the outbreak. COVID-19 was classified as the 14th most dangerous communicable disease under the Communicable Diseases Act 2015 on April 22, 2020. Additionally, the government set up the Center for COVID-19 Situation Administration (CCSA) as a specialized agency to handle emergencies.[4]

Chaiyaphum Province reported 128,205 cases of COVID-19, with 217 deaths, resulting in a morbidity rate of 11.27% and a mortality rate of 0.16%, ranking it as the 10th highest in the country.[5] In Chatturat District, there were 6,893 cases and 20 deaths, with a morbidity rate of 9.27% and a mortality rate of 0.29%, making it the district with the highest rates in Chaiyaphum Province. The infections were widespread across all villages in the province.

In response, Chaiyaphum Province established an Emergency Operations Center and appointed a provincial communicable disease committee and District and Sub-district Disease Control Operations Center Working Groups to oversee and manage the COVID-19 outbreak. Despite these efforts, ongoing infections persisted due to a lack of adherence to prescribed measures by the public. Additionally, there was a lack of clarity in practice guidelines from relevant agencies and a shortage of personnel responsible for operations at the local level. Therefore, the researcher aims to investigate the factors influencing these operations to develop effective disease prevention and control models tailored explicitly for Chatturat District in Chaiyaphum Province. These models can then be utilized to enhance the prevention and control of emerging and re-emerging infectious diseases that may arise.

2. METHODS

The study was divided into two phases: Phase I was a cross-sectional analysis study of factors affecting the prevention and control of emerging infectious diseases. Both quantitative and qualitative data were collected. A quantitative data study assesses knowledge and behavior in preventing and controlling people at risk of disease, participating in disease prevention and control operations in SRRT and area network partners, and receiving resource support of disease prevention and control in the Subdistrict Disease Control Operations Center Working Group. Qualitative data included group meetings by SWOT analysis of the District Disease Control Operations Center working group on the management issue for preventing and controlling

emerging infectious diseases in the area. The results will support and be used as guidelines for developing disease prevention and control operations in the next phase. The sample groups were divided into three groups: 1) 364 COVID-19 risk groups, with the sample size calculated using the formula by Daniel [7], utilizing simple random sampling. (Figure 1.) 2) 252 members of the Surveillance and Rapid Response Team and area network partners by selection all. (Table 1.) 3) 168 members of the working group of the Sub-district Disease Control Operations Center were selected through purposive sampling by selection all. (Table 2.) Phase II was action research aimed at developing a model for preventing and controlling emerging infectious diseases through area network participation in Chatturat District, Chaiyaphum Province. Following the concept of Kemmis and McTaggart [6], the study was conducted for one cycle involving planning (P). At this group discussion meeting, results from Phase 1 were brought together to plan and determine guidelines for joint prevention and control of emerging infectious diseases. Action (A) was the operation according to the jointly determined plan by the working group of all parties involved. Observation (O) was a participatory observation of the work performance of the working group. To follow up on performance and reflection (R), bring performance results together to extract lessons and analyze them to review and determine solutions to problems. This will result in a more appropriate format for improving planning and operations.

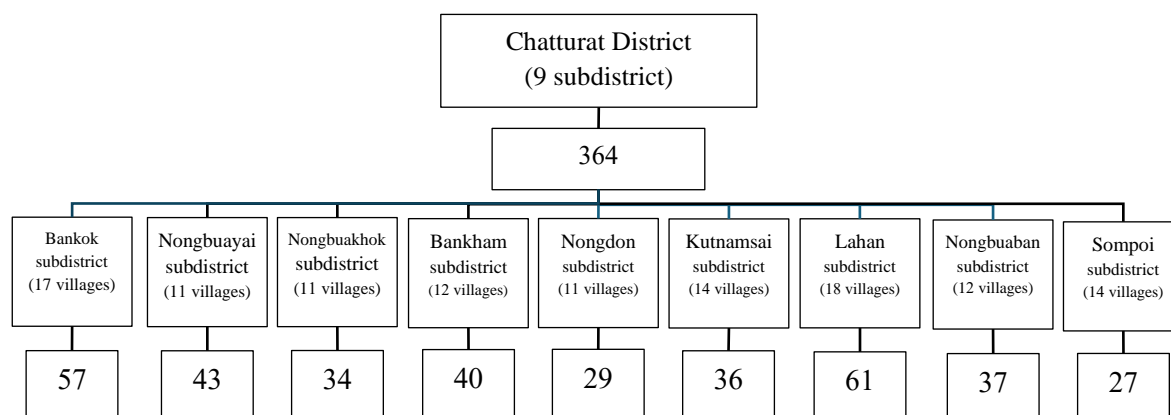


Figure 1. The diagram shows the number of sampling

Table 1. The number of Surveillance and Rapid Response Teams and network partners

Position	n
1. Surveillance and Rapid Response Team (SRRT) Chatturat District, Chaiyaphum Province	14
2. Every Subdistrict Headman/Village headman	119
3. Chairman Village Health Volunteer (VHV), village level	119
Total	252

Table 2. The number of Working groups of the Subdistrict Disease Control Operations Center

Position	n
1. Deputy District Chief, responsible for the subdistrict	9
2. Mayor/Chief Executive of the SAO of anywhere	11
3. Municipal Clerk/Chief Administrator of the SAO of anywhere	11
4. Policeman assigned to the sub-district level	9
5. Village headmen of every village	119
6. Head of Subdistrict Health Promoting Hospital	9
Total	168

Instruments

This study involved three questionnaires. Set 1 focused on knowledge and behavior related to preventing and controlling emerging infectious diseases, specifically COVID-19. Set 2 examined team participation in disease prevention and control operations, including the SRRT and area network partners. Set 3 assessed the support received in disease prevention and control operations by the working group of the Sub-district Disease Control Operations Center, along with interviews conducted with the working group of the District and Sub-district Disease Control Operations Center. Five experts checked the content validity; the reliability values were 0.828, 0.960, and 0.937, respectively. Data collection between January 2023 and June 2023, conducted by the researcher and research assistants after receiving ethical approval from the Human Research Ethics Committee, Mahasarakham University, as follows:

The target group was selected according to the specified qualifications and explained and asked for cooperation from the target group. It was both a document and an explanation of its purpose. The benefits of research procedures for collecting data and the rights of target groups explain that if the target group does not participate in this project, there will be no present or future impact. The target group also has the right to withdraw at any time. This research will be kept confidential and presented as a whole. After that, allow the target group to ask questions until they understand and are free to decide whether to join the project or refuse to join it. When the target group voluntarily expresses their consent to participate in the research. Therefore, the target group was asked to sign a consent form to participate in the study. Information was kept secret. It was in a safe place, and no individual information was disclosed to the point of being able to identify the person, which would have caused the research participants to lose their privacy. The obtained data will be destroyed. After the analysis and writing of the post-research report, it was completed within one year.

Analysis variables

Personal characteristics such as gender, age, occupation, marital status, education level, income, work experience, and group-specific information are included in the study.

Group 1, "People at Risk," consists of a knowledge variable about emerging infectious diseases with 15 yes or no questions and a preventive behavior variable with 20 questions rated on a 5-level scale.

Group 2, "SRRT and Area Network Partners," consists of variables related to participation in disease prevention and control, divided into six parts with four items each, totaling 24 items rated on a 5-level scale. The criteria used to determine participation in preventing and controlling emerging infectious diseases were: At a high level, with a score of 80.00 percent or higher. At a

moderate level, with a score of 60.00-79.99 percent. At a low level, with a score of less than 60.00 percent.

Group 3, “The Working Group of the Sub-district Disease Control Operations Center,” includes variables related to receiving support in disease prevention and control operations, divided into 5 parts with 4 items each, totaling 20 items rated on a 5-level scale and the specific criteria used to determine receiving support in disease prevention and control operations were: At a high level with a score of 80.00 percent or higher. At a moderate level, with a score of 60.00-79.99 percent. At a low level, with a score of less than 60.00 percent.

Statistical analysis

Descriptive statistics were utilized to outline the general characteristics of the sample, including numbers, percentages, averages, and standard deviations. Inferential statistics were employed to analyze the behavioral components of COVID-19 risk groups, conduct factor analysis, and examine the association between knowledge and, behavioral components and personal factors using multiple regression analysis. In the working group of the Sub-district Disease Control Operations Center, groups receiving support for preventing and controlling emerging infectious diseases were classified and analyzed using discriminant analysis statistics. Qualitative data was analyzed through content analysis.

3. RESULTS

Phase I: Study the factors affecting preventing and controlling emerging infectious diseases.

1. General characteristics

The three sample groups had different demographic characteristics. The COVID-19 risk group (Group 1) had a higher proportion of females than males (71.40%:28.60%), as did the SRRT and area network partners (Group 2; 76.19%:23.81%), while the working group of the Sub-district Disease Control Operations Center (Group 3) had more males than females (76.20%:23.80%). The average age was between 41 and 50 years in Group 1 and Group 2, while Group 3 was between the ages of 51 and 60 (53.00%). Education levels were similar, with most participants having graduated from high school/vocational certificate programs (57.40%, 59.90%, and 54.20% in groups 1, 2, and 3, respectively). In terms of income, it was observed that groups 1 and 2 mostly had incomes less than 6,000 baht (42.90% and 45.60%, respectively), while most of the participants in Group 3 had incomes ranging from 6,000 baht to 12,000 baht (39.00%). Group 3 had more experience, with 28.60% having over 20 years of experience, while Group 2 mainly consisted of new workers (1-5 years of experience). In Group 1, it was also noted that 64.80% of individuals in the risk group had other underlying diseases that put them at risk of severe illness if infected with COVID-19. Specifically, 14.80% were elderly individuals aged 60 years and over, 9.30% had diabetes, 6.30% were obese, and 2.50% had cerebrovascular disease.

2. Factors affecting the prevention and control of emerging infectious diseases

Population(Group 1) exhibited an average knowledge level at a moderate level (Mean =13.32, SD=6.78), while their preventive behavior was at a high level (Mean=3.99, SD=0.98). It was observed that increased knowledge positively influenced behavior in disease prevention (Mean difference=0.09) and ATK testing (Mean difference=0.34), leading to self-defense behavior against infection. Additionally, three unique behaviors were identified that did not align with the group’s general behavior: 1) ATK testing, 2) COVID-19 vaccination, and 3) Receiving vaccination after recovering from COVID-19 to boost immunity. (Figure 2.)

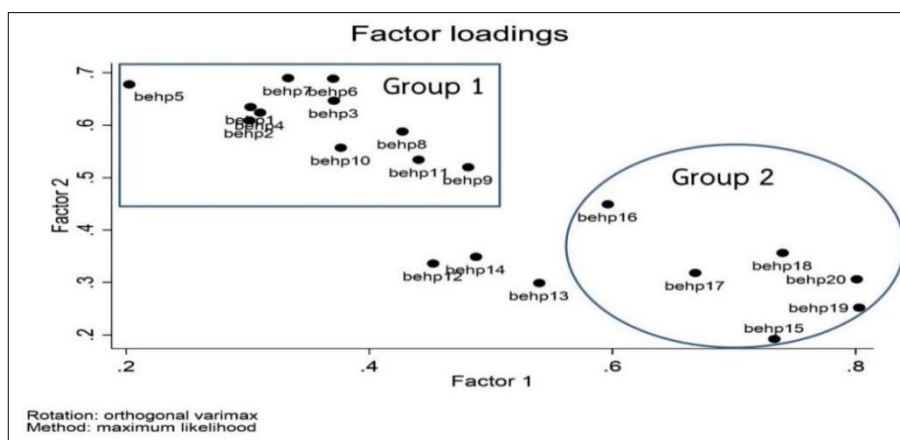


Figure 2. Segregation of behavioral components for prevention and control of emerging infectious diseases among COVID-19 risk groups

SRRT and area network partners have shown high levels of participation overall in preventing and controlling emerging infectious diseases. The mean score was 4.27, with a standard deviation of 0.69. When analyzed based on the level of involvement in disease prevention and control, the following results were observed: participation in surveillance was at a high level of 82.54%, screening to identify diseases in high-risk groups was at a high level of 84.50%, confirmation of cases was at a high level of 69.05%, medical care and rehabilitation of patients had a high level of 68.25%, and participation in investigations was at a high level of 71.03%. Overall, participation in preventing and controlling diseases was at a high level of 82.54%. (Table 3.)

Table 3. Level of Participation in the Prevention and Control of Emerging Infectious Diseases among the Surveillance and Rapid Response Team and Area Network Partners in Chatturat District, Chaiyaphum Province

Participation in prevention and control disease	Participation level					
	Low (Below 60 percent)		Moderate (60-79.99 percent)		High (80 percent or more)	
	n	percent	n	percent	n	percent
1. Surveillance	16	6.35	28	11.11	208	82.54
2. Screening	7	2.79	32	12.69	213	84.50
3. Confirmation	28	11.11	50	19.84	174	69.05
4. Medical care and rehabilitation	39	15.48	41	16.27	172	68.25
5. Investigation	26	10.32	47	18.65	179	71.03
6. Prevention and Control	12	4.77	32	12.69	208	82.54

The working group of the Sub-district Disease Control Operations Center (Group 3), consisted of 168 people, compared variables that affect the receipt of support for preventing and controlling emerging diseases. They found that the support received could be classified into three levels: moderate level of support (80.90%), high level of support (17.90%), and low level of support

(1.20%). The discriminant group classification analysis revealed that four variables influenced support: workforce, financial resources, materials, and technology. The groups were able to be classified at all three levels with statistical significance (p -value < 0.001). A group classification equation (Discriminant function) was derived, with only the technology support variable being a positive factor. The equation in standard score form is as follows: $Y = -0.318$ (manpower) - 0.397 (financial resources) - 0.629 (materials) + 0.061 (technology). (Figure 3.)

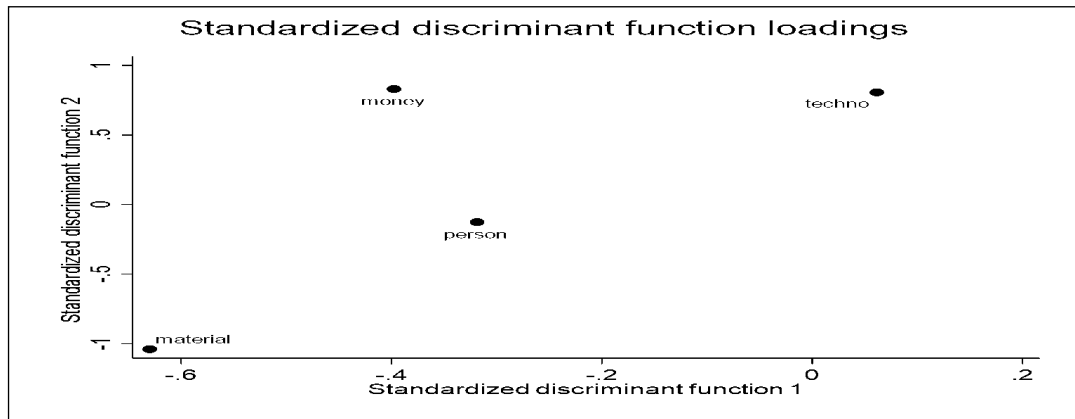


Figure 3. **Four variables that can explain the group classification equation**

Phase II: Study develop the process for prevention and control of emerging infectious diseases

The results showed that the working group of the Sub-district and the Village Disease Control Operations Center, along with area network partners, participated very well at every step of the action research process, which consists of four steps.

1) Planning: First, a forum was organized for the SRRT and area network partners to plan for preventing and controlling emerging infectious diseases. Input data from the results of the study in Phase 1 was used. Then, a discussion forum was organized for the District Disease Control Operations Center working group to consider planning for the prevention and control of emerging infectious diseases, using input data from the first planning phase (P1). Additional improvements were made, projects were approved, and additional members were appointed to the Village Disease Control Operations Center working groups. Guidelines were set for supporting resources in operations.

2) Action (A): The researcher submitted a plan and operational model for preventing and controlling emerging infectious diseases to the Sub-district Health Promoting Hospital in the area and organized a meeting to explain operational guidelines to stakeholders. From April to June 2023, 555 patients with Coronavirus 2019 received outpatient case treatment, medication, and home quarantine. Only family members were contacted, reducing the infection rate from 17.85% to 6.85% with no cluster outbreaks. All patients and COVID-19 risk groups underwent disease investigation and screening within 48 hours and received care, advice on disease prevention, and ATK tests from public health officials, village health volunteers, and the Village Disease Control Operations Center working group. COVID-19 risk groups with negative attitudes towards disease prevention and control, especially regarding COVID-19 vaccination, were targeted through communication using media channels related to or trusted by the individuals. Home visits and discussions increased vaccination cooperation among COVID-19 risk groups, rising from 60% to 90% during that period.

3) Observation (O): The researcher monitored operations to prevent and control emerging infectious diseases in each sub-district. They observed the participation of the working group, provided advice, and resolved operational obstacles. The results showed very good cooperation.

4) Reflection (R): Organized a group meeting for forum group discussions, including the Sub-district and Village Disease Control Operations Center working groups, to reflect on operational results and provide suggestions for development. Lessons learned were summarized, identifying the factors of success in operations. It was found that the success and satisfaction in the operational model could be explained by the “3P Model” structure, which includes “5 Power,” “6 Participation,” and “7 Proactive.” The summary of the process of developing a model for the prevention and control of emerging infectious diseases through area network participation in Chaturat District, Chaiyaphum Province, can be explained by the “3P Model”. (Figure 4.)

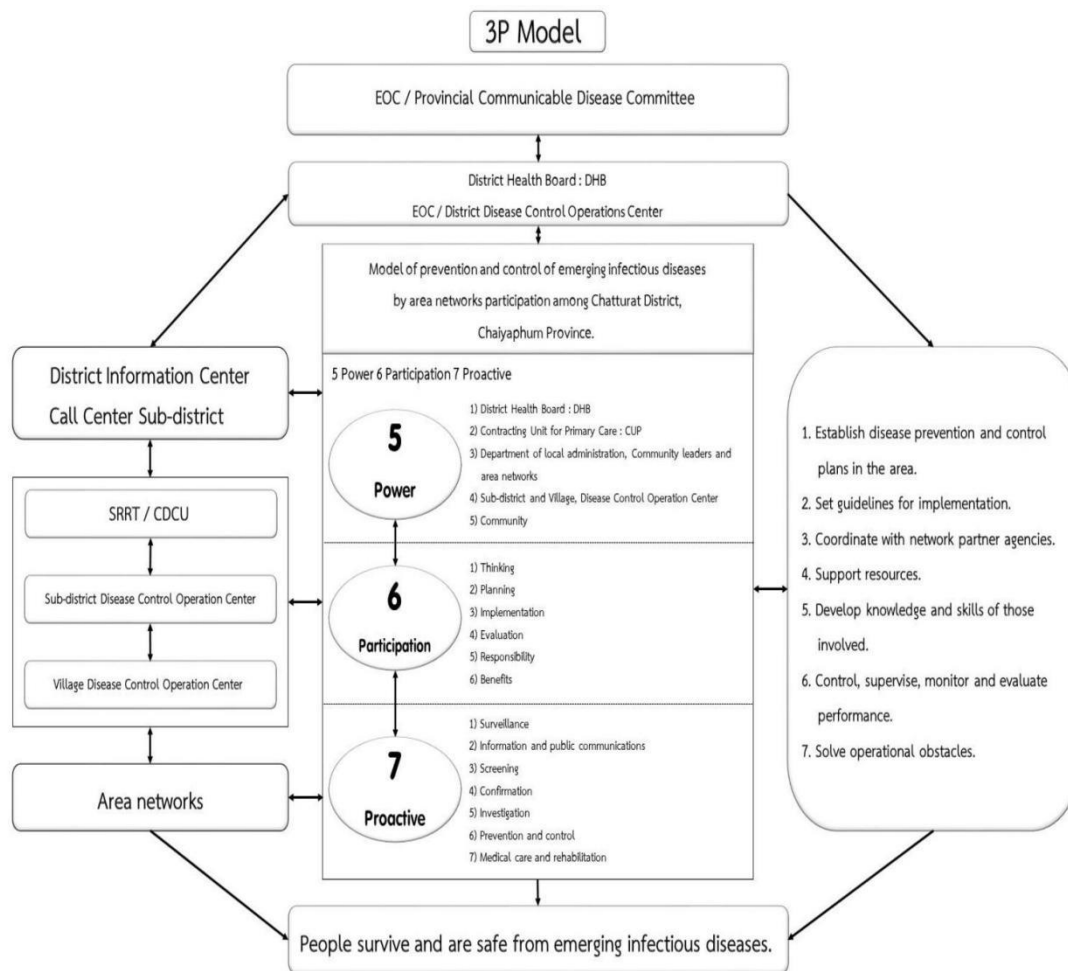


Figure 4. Flow chart of the 3P Model: Prevention and Control Operational Model in emerging infectious disease by area network partners participation (Authors' design)

Satisfaction in operations

The results showed satisfaction with the models for preventing and controlling emerging infectious diseases. Overall, the satisfaction level was high (Mean=4.17, SD=0.523). When looking at individual items, the highest level of satisfaction was with the cooperation of personnel

and networks, including the public in operations (Mean=4.42, SD=0.660), while the item with the lowest level of satisfaction was the suitability of manpower, financial resources, materials, management, and technology (Mean=3.93, SD=0.986). (Table 4.)

Table 4. Satisfaction with the prevention and control model of emerging infectious diseases in the working group at the Subdistrict Disease Control Operations Center, Chatturat District, Chaiyaphum Province

Questions	Mean	SD
1. Work activities are in accordance with the goals and plans of the working group.	4.08	0.506
2. Work activities are consistent with standards and measures according to the policy.	4.15	0.575
3. Suitability of man / money / materials / management / technology	3.93	0.986
4. Appropriateness of the duration of each activity.	4.02	0.781
5. The methods/activities performed in each step are consistent with the set goals.	4.21	0.601
6. Able to perform all activities as specified.	4.15	0.638
7. Cooperation of personnel and networks including the public in operations.	4.42	0.660
8. Monitoring and supervising the operation of activities.	4.17	0.619
9. Performance achieved according to objectives and goals.	4.21	0.570
10. The results of operations benefit the people.	4.38	0.544
Total	4.17	0.523

Factors for success in operations

The success factors were attributed to: 1) Receiving cooperation from related agencies and area network partners. 2) Support from the Local Administrative Organization for operating resources. 3) People cooperating in complying with preventive measures.

4. DISCUSSION

Knowledge of preventing and controlling emerging infectious diseases among at-risk people was moderate. However, behavior related to disease prevention was at a high level. Illness was associated with decreased knowledge, while self-protective behavior was linked to increased knowledge, as seen in previous research [8] [9] [10] [11]. This study also found that education level was associated with behavior to prevent Hand, Foot, and Mouth disease and COVID-19.

Participation in preventing and controlling emerging infectious diseases was at a high level (70.10%). Similar to other studies [12] [13] [14] [15] [16] [17], effective participation in operations received cooperation from all sectors, with key roles played by the community, community leaders, and health personnel.

Receiving support for operations related to the prevention and control of emerging infectious diseases revealed an overall moderate level of support (80.90%). Positive support was observed in technology, while support in human resources, finances, and materials was lacking. Consistent with other studies [18] [19] [20], receiving resource support for operations related to the prevention and control of emerging infectious diseases was at a moderate level. The development of technology for communication was found to enhance systems and mechanisms for monitoring and responding to emergencies [21] [22] [23] [24].

Operational model for the prevention and control of emerging infectious diseases identified seven key steps as follows:

- 1) Surveillance: Implementing guards at checkpoints.
- 2) Information and Public Communications: Utilizing proactive personnel and village news towers.

- 3) Prevention and Control of Disease.
 - 4) Screening to detect the disease and quarantine for 14 days.
 - 5) Confirmation of the disease occurrence by hospitals.
 - 6) An investigation was conducted by SRRT, village health volunteers, and community leaders taking proactive measures.
 - 7) Medical care and rehabilitation following treatment guidelines and doctor's recommendations.
- Similar results from previous studies [24][25] [26] [27] highlighted the importance of surveillance, prevention, and control measures for COVID-19, including management, surveillance, screening, investigation, prevention, and control.

The development of a model for the prevention and control of emerging infectious diseases emphasized the involvement of area networks in all stages of development, including planning, action, observation, and reflection on lessons learned. This study highlighted the following points:

- 1) Promoting and supporting training to enhance the knowledge, skills, and confidence of personnel and area network partners in preventing and controlling emerging infectious diseases. Previous studies [28] [29] also emphasized the importance of personnel competencies in screening, identifying, and isolating patients promptly and the readiness of health team personnel and equipment.
- 2) Planning for preventing and controlling emerging infectious diseases involved collaboration and participation of area network partners from various sectors in determining operational activities, methods, clear roles, and responsibilities. This approach ensured the development of comprehensive operational guidelines. Similar to previous research [24], success factors in conducting surveillance, prevention, and control of COVID-19 were highlighted.
- 3) Driving the operation for the prevention and control of emerging infectious diseases by the SRRT, a working group of the Sub-district, and the Village Disease Control Operations Center. Implementation was carried out according to the established action plan. It was observed that people received information regularly, received the COVID-19 vaccine according to specified criteria, and all COVID-19 patients received medical care and follow-up. Local administrative organizations and area networks had plans and projects to address outbreaks of emerging infectious diseases. Similar results to the study[31], were found in setting goals for providing public services, conducting joint tracking, listening to public opinions, and establishing rules for common practices in every village.
- 4) Information and public communication in preventing and controlling emerging infectious diseases were emphasized by establishing the Chaturat District Information Center by the Chaturat District Public Health Office. A call center was promoted in every sub-district, and coordination channels were provided through Line, Facebook, and other applications to communicate disease information occurring in the area with various network partners, making it easily accessible and quick for people to access. Similar results to studies[30][31] indicated that the spread of emerging infectious diseases can be mitigated by people's behavior adapting to the new way of life.

The limitations of this study include data collection using a questionnaire in which the target group answered questions independently. The information obtained depends on the respondent's experience, attitude, satisfaction, and limitations that may occur during the data collection and

analysis process, such as the target group of people at risk of disease not being in the area during the data collection period, which resolved the problem by making an appointment for the next time, including the District Disease Control Operations Center working group's target group and area network partners. Some people move their workplaces to other places. Solve the problem by collecting data by conducting telephone interviews or sending back questionnaires by post. This study was conducted in a single district in Thailand. This cannot be generalized from the study's findings to other areas. Other limitations include the possibility of sampling bias due to simple and specific sampling methods and specific populations of some groups. However, these limitations were met using quantitative data, collected by surveying the target group comprehensively, and qualitative data collection methods by meeting and interviewing those involved in the work. To support the reliability of the information found, the information studied will consider various factors such as knowledge and behavior for disease prevention and control. Resources used for operations Various obstacles, these factors, statistical analysis such as factor analysis, discriminant analysis, and multiple regression will be used to validate the proposed model, and content analysis can provide a deeper understanding of the experiences and perspectives of individuals and groups involved in the prevention and control of emerging infectious diseases in the area.

The operation aims to prevent and control emerging infectious diseases in Chaturat District, Chaiyaphum Province. That was a proactive operation. Network partners in every sector participated in thinking, planning, implementation, evaluation, responsibility, and benefits. I have knowledge, understanding, and readiness to work as a team through continuous training on time. Relevant agencies or organizations should carry out the following operations.

1. District Disease Control Operations Center and related agencies. The following operations should be performed. Establish disease prevention and control plans in the area, set guidelines and measures for operations, coordinate with network partner agencies, support resources, develop skills and knowledge of those involved, control, supervise, monitor, and evaluate operations, solve obstacles in operations, activities, responsible persons, and roles.

2. Public health agencies, local administration organizations, and related agencies. A plan should be developed to support preventing and controlling emerging infectious diseases and prepare the budget, materials, and equipment to support operations adequately.

3. Public health agencies should develop data and information systems regarding emerging infectious diseases. Allow network partners and the public to have easy access. To stimulate and recognize problem conditions quickly and on time.

The operations for prevention and control of emerging infectious diseases in the Chaturat District area of Chaiyaphum Province in the 3P model can prevent and control the spread of COVID-19. Different countries or regions may have the same or other guidelines or criteria at the district level, compared with guidelines for preventing and controlling emerging infectious diseases. That was due to the importance of disease surveillance and rapid communication of information for rapid disease prevention and control. There may also be differences in specific strategies, such as arranging quarantine facilities for patients. In public places, Local quarantine and home quarantine cover all areas. COVID-19 vaccination campaign with the media that the people accept and the public media in the village, namely the village news tower that continuously broadcasts news. That was compared to guidelines other countries or regions established in response to the COVID-19 outbreak. It may differ from the guidelines set by Thailand. It reflects different cultural, social, and economic contexts. The effectiveness of various approaches will provide in-depth strategies for preventing and controlling outbreaks of emerging infectious diseases and the guidelines can be used in the future.

The development of prevention and control operational model in emerging Infectious disease by area networks participation among Chaturat District Chaiyaphum Province. Several factors contribute to efficient and successful operations as follows:

Factors in the organizational culture of the area: Chaturat District, Chaiyaphum Province, was a district with organizations and agencies that work together closely. There was work in the form of large-scale and ad hoc committees. There was coordination in both formal and informal. There was a follow-up meeting every 1 week for urgency and every month in normal conditions created for possible to receive information from each other promptly; community leaders and network partners, including people having a social form of kinship, have generosity be concerned and attentive to each other when illness occurs in the area. There will be visits to care for each other and not abandon each other. Especially for COVID-19 patients, those who have been quarantined will have follow-up care, home visits, and delivery of food, medicine, and other essentials every day until the patient has recovered from their illness. This caused people in Chaturat District to cooperate and follow the recommendations of the District Disease Control Operations Center working group, doctors, and related agencies.

Summary of practical implications of the study's findings. Can be set as guidelines for relevant agencies, communities, and network partners as follows:

1. Surveillance operations for emerging infectious diseases. Public health organizations and local agencies should provide public relations to the public, including patients and people at risk, who know the severity of the disease. Follow the distancing, hand washing, mask-wearing, testing, and application measures strictly and continuously. There should be health stations in every village, and every community should be encouraged to provide ATK testing kits for public service. Promoting village health volunteers to be able to provide ATK testing services to people in the community.

2. Communication and information operations. Public health officials, village health volunteers, community leaders, and area networks. There should be accurate information communication in the same direction to people covered all through all media channels in the area continuously and up to date with the situation. Explained to patients and relatives. Including people at risk groups realizing the importance of providing accurate information to help prevent, control, and reduce the severity of outbreaks in the community and promote the issuance of village rules that everyone can abide by for prevention and control.

The development of technology and communication systems is vital in preventing and controlling emerging infectious diseases. Currently, online communication is prevalent. Operating followed the 3P model, and communication and information systems were developed by developing public health information management skills for relevant personnel, establishing a public health information center by Chaturat District Health Office, which was considered a center of information about communicable diseases occurring in the area. It forwards information to the public health service network and relevant network partners accurately and promptly. As a result, actions can be taken to quickly prevent and control the spread of disease within a limited area.

Future studies may be helpful from a research approach and cover factors affecting operations to prevent and control emerging infectious diseases. There should be a study of more diverse samples from other areas. This will increase the ability to generalize research results, understand various factors affecting the prevention and control of emerging infectious diseases in multiple contexts, and improve environmental conditions. Additionally, future research could examine the effectiveness of the 3P model by applying it to other countries and regions with different health systems, cultures, and societies. This approach will provide more comprehensive insights into the

factors contributing to success in preventing and controlling disease outbreaks. This will help respond nationally and globally to emerging infectious diseases and the broader public health sector, and ultimately help improve the overall health outcomes of communities worldwide.

5. CONCLUSION

The study on factors affecting the prevention and control of emerging infectious diseases highlights the importance of disease prevention and control with good cooperation from local network partners. People have shown positive changes in their behavior, except for specific features like ATK tests and COVID-19 vaccinations, which are personal choices. However, there have been challenges in supporting operations due to issues related to manpower, finances, and resources, with technology support being the only reliable aspect. It is crucial to address these challenges through effective public communication strategies and campaigns to emphasize the significance of COVID-19 vaccines and ATK tests.

Training programs for personnel and health network partners are essential to enhance expertise in disease prevention and control and facilitate resource sharing. The development of models for preventing and controlling emerging infectious diseases has been successful through the collaborative efforts of network partners. This has led to the establishment a system that delivers higher quality and standards of public services, ensuring convenient and efficient services across all areas.

The developed model has proven effective, as evidenced by the high satisfaction levels of local health network partners with the overall operating model. The cooperation among personnel network partners from various sectors and the public has successfully enabled the operation to achieve its objectives. This has resulted in significant benefits for the community, and the model can serve as a foundation for future improvements and developments in operations.

6. RECOMMENDATIONS

All sectors should be involved in operations by promoting the integration of resources; they define activities and operational guidelines, specifying responsible persons' clear roles and responsibilities. There should be a plan to support the prevention and control of outbreaks of emerging infectious diseases, and budgets, materials, and equipment should be prepared to support operations adequately. The development of information systems regarding emerging infectious diseases should be promoted to relevant agencies' network partners, and the public can access news information by themselves to stimulate and recognize problem conditions quickly, continuously, and on time. Promoting research and development of technology linking information systems and patient reporting included modern emerging infectious disease risk groups of the District Public Health Office. Sub-district Health Promoting Hospital, Community Hospital. To access information in operations and summarize reports to expand results easily and quickly.

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Competing Interests

The authors declar no conflict of interests.

Ethical Approval

The study was approved by the ethics review board of Mahasarakham University, Thailand. The certification number is 411-402/2022, and the certification date is December 28, 2022.

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