

Successful Management of the Response to the COVID–19 Pandemic in the Bangkok Metropolitan Administration

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Abstract:

Objective: This research aimed to study the successful management of the response to the COVID–19 pandemic in the Bangkok Metropolitan Administration.

Material and Methods: A mixed–methods convergent design was conducted. The qualitative component involved 30 semi–structured interviews with healthcare providers from three public health service centers in the Bangkok Metropolitan Administration, using seven open–ended questions until data saturation was reached. The quantitative sample, based on G*Power analysis, comprised 300 healthcare providers who were willing to complete informed consent forms and online questionnaires comprising three sections. Qualitative data were analyzed using thematic analysis, and quantitative data were analyzed using descriptive statistics. Data convergence was achieved through joint display matrices.

Results: The convergent mixed–methods research findings demonstrated alignment between the qualitative and quantitative data. The convergent mixed–methods analysis integrated qualitative and quantitative findings through joint presentations, indicating four key factors: (1) the customized policy frameworks for contextual implementation; (2) optimizing human capital through enhanced resource allocation; (3) the development of community integrated operational pathways to complete the care continuum; and (4) the enhancement of system capacity to improve discharge experience and staff welfare.

Conclusion: The response to the COVID–19 pandemic was characterized by a control structure that excelled at issuing broad directives but failed to address the resource allocation and human welfare aspects of pandemic management.

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Therefore, guidelines for formulating management strategies for emerging infectious diseases may facilitate their sustainability across future pandemics while maintaining compassion, equity, and resilience within the community.

Keywords: Bangkok Metropolitan Administration, COVID-19 pandemic, successful management of the response

Introduction

COVID-19 was officially declared a pandemic worldwide in 2020. According to the World Health Organization (WHO), in 2020, 26,921 new cases were reported within 24 hours. The COVID-19 virus has demonstrated rapid dissemination and a substantial mortality rate, partly due to the lengthy process of developing a vaccine^{1,2}. Thailand reported its first case outside China on January 13, 2020; cases peaked during the Omicron wave with 25,615 new cases on February 26, 2022³. The Royal Thai government successfully suppressed the spread of COVID-19. The measures implemented included hazard assessment, risk data distribution, and risk mitigation strategies. COVID-19 has been formally designated as a highly contagious disease with a substantial likelihood of spreading under the Communicable Disease Act B.E. 25583 by the Ministry of Public Health of Thailand.

The Bangkok Metropolitan Administration (BMA) has been conducting a public awareness campaign on illness prevention in accordance with the criteria established by the Department of Disease Control (DDC). There was a concerted effort to coordinate risk communication and enhance operational officer expertise⁴. BMA has continually taken measures to control and reduce the spread of COVID-19 and to minimize its influence on social interactions. The BMA has been actively involved in controlling and averting the spread of COVID-19 through the Center for Emergency Response to Public Health Emergencies in the Case of Coronavirus Disease 2019, which operates under the Comet for Health⁵. The Bangkok

BMA experienced exponential growth in the disease's infection rate, prompting the government to declare a state of emergency on March 26, 2020, and enforce the COVID-19 Prevention Act and Control in April 2020¹. However, various factors influenced the slight growth in the strength of the healthcare system in Thailand between the public and private sectors⁶.

Bangkok plays a crucial role in facilitating the management of diseases at the regional level in Thailand. Implementing these measures was coordinated effectively across multiple sectors nationwide, resulting in a decrease in infection incidence in Thailand. The transmission of COVID-19 in Thailand was successfully mitigated through a combination of measures with support from various sectors⁶. Although Bangkok was the region most severely affected by COVID-19, it took multiple measures to handle the disease. The strategy effectively curtailed COVID-19 transmissions. However, the current control and preventive measures still enable the spread and comeback of infectious diseases. Therefore, analyzing the strategies employed to prevent and control communicable diseases in Bangkok is crucial. This research will provide a significant reference for effectively controlling the COVID-19 outbreak in Bangkok and for developing strategies to manage future outbreaks of COVID-19 or other emerging infectious diseases.

Despite extensive reports on Thailand's COVID-19 response, the BMA lacks a comprehensive evaluation that integrates quantitative indicators with qualitative stakeholder narratives, and a convergent mixed-methods assessment that addresses this gap and produces actionable evidence

for dense urban health policy to systematically explain the key elements that contributed to the successful management of the response to COVID-19 in Bangkok. The findings are organized and presented using the Context–Input–Process–Outcome (CIPO) framework. This framework illustrates the interrelationships among policies, resource allocation, operational processes, and outcomes in determining pandemic management in Bangkok, as shown in Figure 1.

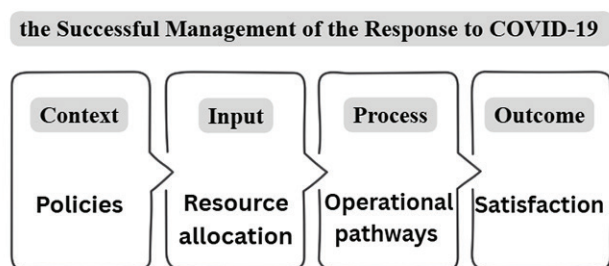


Figure 1 CIPP model

Material and Methods

Methodology

This study employed a mixed-methods approach, combining quantitative and qualitative data to gain a thorough and nuanced understanding of Bangkok's preparedness for future outbreaks of infectious diseases. A convergent mixed-methods research design collected qualitative and quantitative data to incorporate participants' viewpoints with survey data, aiming to discover areas of convergence between the two types of data through a comprehensive approach that pragmatically combines several methodologies, including quantitative and qualitative research, to cross-validate and address the same topic and facet of a phenomenon^{7,8}.

Population and sample

Population

The population included healthcare providers who worked in BMA during the COVID-19 pandemic between January 2020 and September 2022.

Sample

The public health centers were selected using stratified sampling, including Bangkok North, Bangkok Central, and Bangkok South. The purposive sample included healthcare providers who worked in Bangkok during the COVID-19 pandemic, from January 2020 to September 30, 2022⁹.

Sample size

For the qualitative phase, 30 participants were purposively selected based on their roles in epidemic response, ensuring diversity across areas, professional backgrounds, and years of experience, with data saturation considered¹⁰. The inclusion criteria for research participants were healthcare providers working in Bangkok, including doctors, nurses, and public health officers from each unit, who had graduated with at least a bachelor's degree and had worked continuously throughout the COVID-19 pandemic. The exclusion criteria were healthcare providers who left the public health center after the COVID-19 pandemic.

The G* power analysis for the quantitative samples demonstrated exceptional statistical power (0.90) and medium effect sizes (0.50) in each area across three public health regions in Bangkok (92 participants each from North, Central, and South). An additional 10% was added to account for potential non-response or participant withdrawal during the study. Finally, 300 healthcare providers from healthcare centers in three areas voluntarily provided informed consent and completed the online questionnaires.

Research instruments

1. Qualitative research conducted semi-structured interview guidelines with seven open-ended interview questions to gather information and answers on the topics to be studied, using probe and prompt questions to limit the interview to the research scope^{9,10}. The interview comprised seven open-ended questions and probing questions.

2. Quantitative questionnaires to operational data, unclear meaning of healthcare providers in BMA during the COVID-19 pandemic, were used to collect quantitative data, consisting of 5 sections, including 1) general information consisted of 7 open-ended questions, 2) questionnaire on the COVID-19 response policies of Thailand and Bangkok consisted of 5 multiple-choice questions, 3) questionnaire on personnel readiness, medical equipment, and communication, 4) questionnaire on the processes for preventing the spread of disease, treating infected patients, and rehabilitating and returning patients to the community, 5) questionnaire on the satisfaction of medical personnel in responding to the COVID-19 pandemic.

Three experts reviewed the research tools to assess the questionnaire's content validity regarding healthcare providers' opinions in Bangkok during the COVID-19 pandemic. The index of consistency (IOC) for the research questionnaire was 0.93. The researcher then tested the revised questionnaires on 30 samples, which were not part of the research sample. The Cronbach's alpha coefficient of reliability was 0.86.

Data collection

1. Qualitative data collection was conducted after gaining permission and ethical approval from January to September 2023. Semi-structured interviews were conducted using a set of open-ended questions face-to-face at selected public health centres, without a third party present. The individual interview time was approximately

30–45 minutes per person. The participants were required to sign an agreement acknowledging that the interviews were audio recorded and transcribed verbatim by researchers, with the transcripts checked for accuracy. The interviews continued until data saturation was reached^{10,11}.

2. Quantitative data collection focused on the operational data of healthcare providers in BMA during the COVID-19 pandemic between January and September 2023, using a questionnaire through an online survey of healthcare providers in the selected public health center in BMA. Three hundred healthcare providers who met the inclusion criteria were included in the study. The surveys took approximately 20 to 25 minutes to complete. All questionnaire data were kept confidential and anonymous using an identification number (ID)¹⁰. The researcher was aware of all ethical and legal duties.

Ethical consideration

The Ethics Committee of the Bangkok Metropolitan Administration has approved this research project in accordance with international ethical standards. Project Code: E018q/65_EXP on 20 December 2022.

Data analysis

This convergence analysis combined and analyzed qualitative and quantitative data to derive significant conclusions. The following outlines the steps involved in convergence analysis in mixed-methods research.

1. Qualitative data analysis was conducted, beginning with reading the entire transcript of each participant, and re-reading to attune to the meaning of the thinking. The second step, describing lived-experience phenomena within each meaning unit, was also provided and reflected in psychologically insightful statements. A systematic structural analysis was conducted to understand the coherence of lived experience through the research synthesis. Finally, the

essential generality was expressed as the general structure of experience¹¹. The themes emerged after this analytical process.

This study employed four criteria to assess the trustworthiness of the qualitative approach: credibility, transferability, dependability, and confirmability. It also fosters trustworthiness because all the research data were stored in a secure location to protect confidentiality. Therefore, maintaining interview records, field notes, and data transcripts has been used to ensure rigor and enhance the study's trustworthiness.

2. Quantitative data analysis was performed using a statistical software package to analyze the quantitative data using descriptive statistics, including frequency distribution, percentage, mean, and standard deviation. The questionnaire data were analyzed using statistical software, and the results were reported. The qualitative method played a significant role in the study's data collection and analysis, providing in-depth explanations of the quantitative results. The quantitative and qualitative methods were then integrated during the qualitative phase, as participants were selected for qualitative analysis and interview questions were developed based on the results of the statistical tests. The first quantitative phase of the study started with the collection and analysis

The convergent mixed-methods research design employed multiple methods to integrate quantitative and qualitative approaches, facilitating cross-validation and addressing the same questions and aspects of a phenomenon¹². Qualitative data from the key informant interviews were coded using thematic analysis¹¹, while quantitative survey results were analyzed using descriptive and inferential statistics. Data convergence was achieved through joint display matrices, in which quantitative scores were directly compared and explained with illustrative qualitative quotes.

Results

The convergent mixed-methods research presented joint displays of qualitative and quantitative findings, integrated to provide a comprehensive understanding of the results. Several points of convergence emerged, where numerical data patterns were reinforced and explained by qualitative narratives. The situation of the success of Bangkok's management in responding to the COVID-19 pandemic was as follows:

The average age of the participants was 37. The oldest was 59, and the youngest was 27. Participants were 93.33% female and 6.67% male; 61% of participants had a bachelor's degree, and 38.46% had a higher degree. The participants worked as doctors (7.69%), nurses (53.85%), public health officers (30.77%), and other employees (7.69%). The average length of service in Bangkok was 13 years, with a range from 3 to 33 years.

Research has shown that quantitative results are consistent with qualitative results. The overall success of Bangkok's management in responding to the COVID-19 pandemic can be divided into four main issues.

Context factor

The study revealed a high degree of policy congruence between national and local organizations in their responses to the COVID-19 pandemic, as evidenced by a strong overall policy implementation score of 82.87%. This straight central guidance explains why the policy response dimension was scored highest at 91.67%. Conversely, the appropriateness of policy received the lowest score (76.67%). This congruence was driven by adherence to central directives, as an informant noted that Bangkok's policy consistently followed the Ministry of Public Health's direction. Accordingly, a participant (Case 4) stated that *"Bangkok will follow the guidelines set by the Ministry of Public Health."*

Therefore, a joint display of integrated quantitative and qualitative results indicated that policies should be appropriately adapted to potential challenges in national and local contexts. A key finding from the context factor is the customized policy frameworks for contextual implementation.

Input factor

Overall readiness was moderately high, at 70.90%. The findings revealed a significant imbalance between human resource preparedness and material resource availability. Education and training for staff achieved an excellent score of 92.33%, whereas providing quarantine facilities for infected personnel scored lowest at a mere 21.67%. The explanation for this resource management failure is rooted in a lack of proactive financial planning. An informant emphasized that having a ready budget enables operational flexibility, stating, as a participant (Case 8) said, that *“if we have the budget, we can do anything. We can hire personnel, buy equipment, and even buy time to help us fully do everything necessary.”*

Therefore, a joint display of integrated quantitative and qualitative results indicated that the gap between human and material readiness stemmed not from a lack of staff capability, but from a systemic failure in budgetary preparedness. Therefore, a key finding from the input factor is optimizing human capital through enhanced resource allocation.

Process factor

The process evaluation revealed an entire inconsistency. While processes for prevention, treatment, and rehabilitation were highly effective, scoring 92.33%, the process for reintegrating recovered patients into the community was a critical failure, scoring only 14.67%. A concerning reality emerged from the study that, although the prevention and treatment processes were strong, the reintegration of recovered patients into the community

remained a critical weakness. Qualitative data suggested that a strong sense of personal risk contributed to successful prevention. A frontline worker (Case 39) stated, *“If we are not even a little careful, it can infect us, or we will infect others.”* It was motivating to exercise prudence and actively educate the community.

Therefore, a joint display of quantitative and qualitative results indicated that, although the prevention and treatment processes were strong, the reintegration of recovered patients into the community remained a critical weakness. Therefore, a key finding from the process factor is the development of community integration pathways to complete the care continuum.

Outcome factor

The overall participant satisfaction was moderately high ($M=3.95$, $S.D.=0.71$). Satisfaction was highest with internal operation methods ($M=4.38$, $S.D.=0.49$) and lowest with the process of sending patients home ($M=3.31$, $S.D.=0.72$). This low satisfaction with the discharge process can be explained by the immense pressure on the patient admission system, which faced a critical bottleneck due to bed shortages. However, there are still issues with the transfer of patients and waiting for beds that need to be resolved for the safety of patients and the public, as a participant (Case 7) stated, *“The problem is waiting for a bed in Bangkok. Sometimes, the person has to return home and wait. The wait for a bed in Bangkok is long, and there are not enough.”*

Therefore, a joint display of quantitative and qualitative results indicated that the discharge process placed pressure on healthcare personnel. Low discharge satisfaction was not an isolated failure but rather a symptom of a system operating beyond its capacity. A key finding from the outcome factor is the enhancement of system capacity to improve discharge experience and staff welfare.

Discussion

Framing our analysis with a systems perspective across the CIPP framework, relations consistent with WHO guidance used during Thailand's COVID-19 response emphasize "context" (policies), "input" (resources allocated), "process" (operational pathways), and "outcome" (satisfaction/ welfare) feedback in surge settings^{1,2}.

According to the results of both quantitative and qualitative research, it is clear that Bangkok's COVID-19 response must be implemented across all components, including a comprehensive pandemic response plan. Overall, the sample is satisfied with the government's response to the COVID-19 pandemic, with an average rating of 3.95. The group is most satisfied with the methods, formats, or processes used to prepare equipment for operations, with an average score of 4.38¹³. The sample group is the least satisfied with sending patients home, with an average of 3.31. In line with the qualitative research findings, the success of Bangkok's response to the COVID-19 pandemic comprises four main points. The following four elements should be prepared for the next pandemic.

The first point, context, mentions awareness of policies (91.67%). However, the lowest score (76.67%) was for their appropriateness in actual response work. Increased awareness likely indicates comprehensive BMA communication, whereas reduced appropriateness suggests difficulties in policy implementation in practice due to rapid changes and district-level disparities, as aligned with BMA notices and national advisories¹⁰. These guidelines should be clear, concise, and effectively communicated to all stakeholders¹².

The second point, inputs, refers to the available resources that can be used to address the pandemic¹⁴. These resources included funding, personnel, and technology. It is essential to have sufficient resources to respond effectively to a pandemic. However, the lowest

score was providing quarantine facilities for infected personnel (21.67%). The very low transport score indicated deficiencies in allocated budgets, sanctioned suppliers, and inter-agency communication procedures during emergency operations. Consequently, a system for specified purposes and uniform distribution, adhering to PPE compliance in accordance with national emergency guidelines, should be established^{5,10,15}.

The third point, process, refers to operational readiness. These steps should be well-defined and well-coordinated¹⁵. The lowest score for the process of patients returning to the community after recovery (14.67%) was a particular concern. Weak reintegration reflects the lack of structured follow-up between facilities and community services in a high-density metropolis, where mobility and household crowding complicate isolation and monitoring. A post-discharge community pathway aligns with Bangkok's density profile and operational realities¹²⁻¹⁵.

The fourth point, outcome, refers to the results of the pandemic response¹⁶. The lowest satisfaction at discharge, at 3.31, indicates a weakness in reintegration, suggesting a quality loss during the transition from hospital to home. Implementing discharge bundles and early community follow-up should improve both continuity and satisfaction, in line with the national transition-to-surveillance practices after the emergency measures were lifted^{2,7,15}.

This finding is consistent with a study by Channarong Nainet and Prajak Buapan¹⁷, which found that workers' communication and use of technology, as well as their readiness and willingness to participate, determined the direction of work aimed at effectively preventing and controlling COVID-19. Additionally, collaborative work and budget constraints affected the performance of medical personnel during the COVID-19 pandemic. Moreover, Konduru et al.⁹ found that healthcare providers in India perceived those infrastructures as essential during the COVID-19 pandemic.

Conclusion

The evaluation of the COVID-19 response revealed a complex picture of a system that was simultaneously successful at the national level but weak at the city level. The context factor revealed that a strong, top-down policy structure initiated the response, ensuring high alignment across agencies. However, this national approach lacked the necessary flexibility, failing to adapt to the unique challenges and nuances of local contexts. This policy corresponded to resource allocation. The input factor evaluation revealed a critical gap between human and material readiness. This gap stemmed not from a lack of staff capability, who were well-trained and competent, but from a systematic failure in budgetary preparedness, which left the system without adequate physical assets and contingency funds.

These systemic restrictions proposed a clinical operational pathway. Although processes focused on biomedical interventions, such as prevention and treatment, were robust and practical, the intense emphasis on disease control created a significant gap. The equally critical social process of reintegrating recovered patients into the community was overlooked, emerging as a profound procedural weakness. Ultimately, these interconnected weaknesses led to a predictable outcome. The low satisfaction with the patient discharge process was not an isolated operational failure and placed immense pressure on healthcare personnel. Significantly, it was a clear symptom of a system operating far beyond its capacity, where pressure at the point of admission, caused by material shortages, created a consequent effect that compromised the quality of care at the point of discharge. In conclusion, the response to the COVID-19 pandemic was characterized by a control structure that excelled at issuing broad directives but failed to address resource allocation and human welfare aspects of pandemic management.

Limitations of the study

1. Limiting the sample to medical personnel in only three public health centers in Bangkok may not be representative of all medical personnel in Bangkok or Thailand.
2. Data from questionnaires and satisfaction ratings are self-reported, which may be subject to response bias.
3. The data collection period from January to September 2023 may not cover the entire duration of the pandemic or all significant policy changes that occurred later.

Suggestions

Based on the lessons learned, preparing for future pandemics requires a fundamental paradigm shift from a reactive, disease-centric model to a proactive, resilient, and human-centric system. To build this new capacity, the following strategic recommendations, aligned with the CIPP framework, are suggested.

First, with respect to the context factor, future policy must be designed using an adaptive framework. This aspect involves establishing clear, centralized strategic goals while empowering local authorities with flexibility and resources to tailor their operational tactics. Such an approach will ensure that policies are not only aligned but also appropriate and effective in practice, capable of responding to emergent local challenges.

Second, the input factors require establishing a proactive resource and contingency plan. This means moving beyond in-time logistics to create a readily accessible contingency fund and a strategic stockpile of critical materials. This proactive investment is crucial to bridge the gap between human capability and material readiness, ensuring that capable staff have the tools they need from day one of a crisis.

Third, the process factors must be reimagined to encompass a holistic patient journey. This extends the

scope of care beyond the hospital borders to formally include the critical phases of community reintegration. The integration of psychosocial support teams into the core response protocol is essential, transitioning from a special emphasis on illness to a holistic approach that addresses individual needs and moderates societal stigma.

Finally, to improve outcomes, a proactive patient flow management plan is essential. This involves developing clear protocols to expand system capacity and manage the entire patient journey from admission to discharge as a single protocol and integrated flow. This will relieve staff burden and enhance the quality and satisfaction of patients returning home. Therefore, guidelines for formulating management strategies for emerging infectious diseases may facilitate their sustainability across future pandemics while maintaining compassion, equity, and resilience within the community.

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Conflict of interest

The authors declare that they have no conflicts of interest.

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