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Enhancing COVID-19 (COVID-19/SARI/SVP) pandemic preparedness: Assessment of testing and treatment capacity of the health facilities in Can Tho City, Vietnam in 2023

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ABSTRACT

Vietnam was amongst the top fifteen countries most affected by COVID-19 pandemic in 2021 and 2022. Within Vietnam, Can Tho City witnessed a high case fatality rate at about 12.5 per 1,000 cases, which was higher than that of the nation's average death rate of 3.7 per 1,000 cases. This study aims at evaluating the COVID-19 tests and assessing the capacities of healthcare facilities (HFs) to prepare plans and robust health systems in strengthening pandemic response. We conducted a survey in September 2023 across 53 out of total 130 HFs in Can Tho City, including both private and public hospitals at central, provincial and district level. There were nine different aspects in each HF that worth evaluating whether: namely bed capacity, human resources, hospital capacity for receiving new patients, current treatment approaches for mild/moderate/severe/critical ill patients, medication management capacities, medical supplies and equipment, laboratory testing capacities, infection prevention and control, and communicable disease reporting. Results revealed that regarding the overall capacity, under normal condition, only 1.9% of healthcare facilities (HFs) met the standards for strong capacity, 52.8% with satisfactory capacity and the remaining 30.2% showed unsatisfactory capacity management. Conversely, during the COVID-19 pandemic, no HF reached our expectations for hospital capacity, whereas 52.8% had satisfactory capacity and 32.1% had unsatisfactory capacity. Furthermore, the insufficiency of appropriate medications can be seen in 72% of HFs, 45% HFs had limited testing capabilities, 42% HFs need to optimize hospital bed capacity and 43% struggled to cope with severe cases. Regular assessment plays a vital role in improving the overall pandemic preparedness, especially during the waves of COVID-19 infection, the appearance of new coronavirus variants and increasing virulence of the virus. The coordination at the national level to implement such assessments will bolster future pandemic preparedness and response.

Keywords: COVID-19/SARI/SVP, pandemic preparedness, test and treat, capacity

1. INTRODUCTION

The global outbreak of the COVID-19 pandemic has presented unprecedented challenges to healthcare systems across the world, requiring rapid responses to combat the virus's spread and

mitigate its impact on public health. Vietnam, like many nations, found the need to improve the testing and treatment capacity to manage the crisis in emergency circumstances.

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As of March 2023, Vietnam stands among the top 15 COVID-19 affected countries worldwide, reporting 11,619,990 million cases and 43,206 deaths. COVID-19 vaccination programmed began in March 2021 and had administered more than 266 million doses by 10 May 2023 [1]. The COVID-19 control and prevention strategies in Vietnam has shifted from a “zero COVID-19” into a “Living with COVID-19” model (Prime Minister Resolution 128/CP 11 October 2021) [2]. The virus evolution had already posed the significant challenges, therefore the strategies for testing and treatment need to be assessed and updated frequently in order to mount a more coherent and effective response.

Can Tho is the largest city in the Mekong Delta located in the south region of Vietnam. Being a grade I city directly under central government, the city serves as an economic, cultural, social, medical, educational, and commercial center of the Mekong Delta. Can Tho City possess one of the largest hospitals in the country, which is responsible for receiving and treating infectious diseases of all provinces within Mekong Delta region with around 10 million people. As of March 2023, Can Tho city has recorded 76,925 COVID-19 cases with 958 deaths [1], a significantly high fatality rate of 12.5 per 1,000 cases compared to 3.7 per 1,000 cases nationwide. The morbidity rate in the 18 to under 50-year-old age group accounted for the highest percentage (41.3%) and the mortality rate was mainly reported in the group of 50-year-olds and above [3].

A valuable lesson drawn from this situation was that the important factor contributing to high mortality rate in Can Tho City during the pandemic was the lack of appropriate testing and treatment capacity of the healthcare system [3].

Although MOH introduced much guidance on COVID-19 testing and treatment e.g. official letter No. 2213 validated on 17/4/2023 about strengthening the COVID-19 recognition and treatment; official letter No.3842/BYT-DP validated on 10 May 2021 about enhancing SARS-CoV2 testing capacity. However, in practical settings, guidelines on testing and treatment capacity assessments have not been available [3]. Therefore, health care managers

cannot fully understand the capacity of HFs to mobilize and deploy the necessary resource to respond to the pandemic.

This study aimed to assess COVID-19/SARI/SVP testing and treatment capacity to provide scientific evidence for developing informed investment plans, improving patient care and life-saving efforts for a better pandemic response in the future.

2. METHODS

To explain the gaps mentioned above, a cross-sectional survey was carried out in September 2023 to assess the capacity of healthcare facilities during both pandemic and non-pandemic periods to receive, treat, and test COVID-19/SARI/SVP patients.

Activities have been done:

(i) Developing an assessment tool based on the WHO July 2021 COVID-19 case management capacities and instructions covering nine specific capacities: Bed capacity, medical human resources, Capacity to receive/transfer patients, medical equipment and supplies, Medication resources, Treatment capacity for Mild/Moderate/Severe/Critical ill patients, testing capacity, Infection prevention & control, and Communicable diseases reporting [4]. Scores were assigned to each capacity, and overall capacity for each health facility was calculated for both periods, corresponding to three waves of COVID-19 pandemic from July 2021 to April 2022 in Vietnam.

(ii) Testing and finalizing the assessment tool in six health facilities in HCMC and Can Tho City, followed by training for assessors from the Institute of Public Health in Ho Chi Minh City and Can Tho CDC.

(iii) Assessing the capacity of COVID-19/SARI/SVP testing and treatment systems in 53 out of 130 healthcare facilities in Can Tho, ranging from private to public hospitals at central, provincial and district level.

(iv) Finalizing and visualizing the assessment results on a map by using JavaScript and posted it in Can Tho CDC website.

The assessment was conducted in two main

phases: Phase #1 involved self-assessment at all 130 health facilities in Can Tho City. Phase #2 included 53 out of the 130 health facilities, representing different healthcare levels, sectors, and locations, directly assessed by trained assessors from IPH and CDC. Data were collected and analyzed using Epi-Info and Excel, each capacity have been categorized into four levels: Particularly good, Satisfactory, Unsatisfactory, and Inapplicable. An average score for all nine specific capacities provided an overall capacity for each health facility and have been categorized into four groups: Strong capacity, Satisfactory capacity, Unsatisfactory capacity, and Inapplicable. Upon completing data analysis, scoring, and evaluation, overall and specific capacities of each healthcare facility were visualized on a web-based platform using JavaScript.

3. RESULTS

Among 130 health facilities (HF) participated in phase #1, there are 81 commune health stations (CHSs) accounted for 62.3%; three district health departments (2.3%), 11 District Health Centers (DHC) (8.5%), 15 clinics (11.5%), 19 hospitals (14.6%), and one CDC (0.8%). In phase #2, 53 selected HFs have been assessed by the assessors of IHP team. They included 19 CHSs accounted for 62.3%; 7 DHC (13.2%), 12 clinics (22.6.5%), 14 hospitals (26.4%), and one CDC (1.8%).

After collecting the data, the assessment team analyzed the data of phase #2. The results showed that out of the total of 53 HFs assessed in phase #2, under normal condition, only one HF (1.9%) achieved strong capacity. 28 HFs (52.8%) maintained a satisfactory capacity, whereas 16 HFs (30.2%) were unsatisfactory capacity, with an additional 8 HFs (15.1%) were inapplicable as they were not involved in and responsible for C19/SARI/SVP testing and treatment.

With regards to the pandemic period, this percentage experienced minimal changes. None of the HF met criteria for strong capacity, while 28 HFs (52.8%) were reported to have satisfactory capacity, 17 HFs (32.1%) had unsatisfactory capacity, and the remaining 8 HFs (15.1%) were inapplicable.

Taking these nine specific capacities into consideration, we can find out the weak capacity that need to be improved and should be invested in: (i) Medicine and drug (72% unsatisfactory); (ii) Testing capacity (45% unsatisfactory); (iii) Treatment for critical ill patients (43% unsatisfactory); (iiii) and bed capacity (42% unsatisfactory).

Figures 1 and 2 illustrate the distribution and classification of specific capacities/resources among the 53 health facilities under normal conditions, while Figure 3 demonstrates the COVID-19/SARI/SVP testing and treatment capacity during both pandemic and non-pandemic period. Figure 4 depicts the assessment results for one health facility, Thoi Xuan Commune Health Station.

4. DISCUSSIONS

The findings of this study highlight the significant impact of the COVID-19 pandemic on Vietnam's healthcare system and the urgent need to raise pandemic preparedness and response strategies. The high morbidity and mortality rates observed in Can Tho City emphasize the importance of understanding and addressing healthcare capacity constraints in the face of public health crises. Hoang's paper indicated the lesson learned from the COVID-19 pandemic [5], and Mustafa's study showed the global assessments of preparedness and response plans [6]. Both studies provide valuable context for discussing the implications of this study's findings.

Vietnam's responses to the COVID-19 pandemic have been characterized by a combination of successes and challenges. While the country has demonstrated resilience in preventing the spread of the virus through proactive measures such as extensive testing, contact tracing, and quarantine protocols [5], our study reveals critical gaps in the test and treat capacity of healthcare facilities in Can Tho. These findings align with global trends observed in other regions, including Africa, where healthcare systems have faced significant strain due to the pandemic [7] (Tessema, 2021).

The cross-sectional survey conducted as part of

this study assessed various aspects of healthcare capacity, including bed capacity, human resources, testing capacity, and medicine resources, among others. The results indicate that while some healthcare facilities maintained satisfactory capacity levels under normal circumstances, none achieved strong capacity during epidemic scenarios. This underscores the importance of strengthening healthcare infrastructure, resource allocation, and workforce training to improve pandemic preparedness and response efforts [6] (Mustafa, 2021; [7] Tessema, 2021).

The specific capacities identified as needing improvement, such as medicine resources and testing capacity, are consistent with global recommendations for monitoring health-care

capacity and utilization in decision-making on COVID-19 [8] (WHO, 2021). Regular assessments of healthcare capacity, as outlined in Annex 2 of the WHO COVID-19 Health Service Readiness Assessments [9], are essential for informing investment plans, enhancing patient care, and strengthening healthcare systems.

In summary, the findings of this study highlight the importance of assessing and addressing healthcare capacity constraints to improve pandemic preparedness and response efforts in Vietnam and beyond. By leveraging lessons learned from the COVID-19 pandemic and global assessments of healthcare systems, policymakers and healthcare stakeholders can develop targeted interventions to enhance healthcare resilience and mitigate the impact of future public health crises.

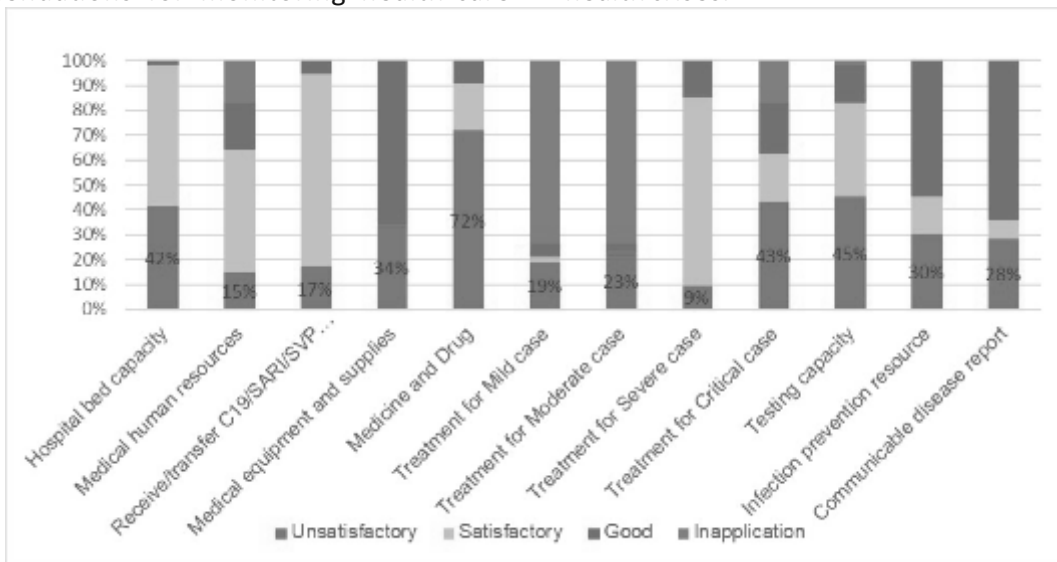


Figure 1. Distribution of specific capacities/resources by percentage of 53 Health facilities in Can Tho City, under the normal conditions

ST	Health facilities	AL. INF-RISK CAPACITY	H. RISK CAPACITY	IC. MEDICAL RESOURCES	D. TRANSFER & PATIENT	C. MEDICAL SUPPLIES AND SUPPLIES	FL. MEDICINE & DRUG	FT. TREATMENT	F26.Treatment for mild case	F26.Treatment for moderate case	F26.Treatment for severe case	F26.Treatment for critical case	G. INFECTION CAPACITY	H. INFECTIOUS PROPHYLAXIS CAPACITY	L. INF-RISK REPORT
1	1. BVHC Trung Tâm Thành Phố	đạt	chưa đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt
2	2. BVHC TP. Cần Thơ	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt
3	3. BVHC Ninh Giang tỉnh	đạt	đạt	chưa đạt	đạt	đạt	chưa đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt
4	4. BVHC Tân Phú tỉnh	KAD	đạt	đạt	chưa đạt	chưa đạt	chưa đạt	KAD	KAD	KAD	KAD	KAD	chưa đạt	đạt	chưa đạt
5	5. BVHC Tân Bình tỉnh	KAD	KAD	KAD	KAD	đạt	KAD	KAD	KAD	KAD	KAD	KAD	KAD	đạt	đạt
6	6. BVHC Tân Hưng tỉnh	KAD	chưa đạt	đạt	chưa đạt	chưa đạt	đạt	KAD	KAD	KAD	KAD	KAD	chưa đạt	đạt	đạt
7	7. BVHC Tân Trà tỉnh	KAD	KAD	đạt	chưa đạt	đạt	đạt	KAD	KAD	KAD	KAD	KAD	KAD	đạt	chưa đạt
8	8. BVHC Tân Phú Long tỉnh	đạt	chưa đạt	chưa đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt
9	9. BVHC Tân Hòa tỉnh	chưa đạt	đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	đạt	đạt	đạt	đạt	KAD	KAD	chưa đạt	đạt
10	10. BVHC Tân An tỉnh	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt
11	11. BVHC Tân Biên tỉnh	chưa đạt	đạt	đạt	đạt	đạt	đạt	chưa đạt	đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	đạt	chưa đạt
12	12. BVHC Tân Châu tỉnh	KAD	đạt	đạt	KAD	đạt	KAD	KAD	KAD	KAD	KAD	KAD	chưa đạt	đạt	đạt
13	13. BVHC Tân Hiệp tỉnh	chưa đạt	đạt	chưa đạt	đạt	đạt	đạt	chưa đạt	đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	đạt	đạt
14	14. BVHC Tân Phú Mỹ tỉnh	đạt	đạt	đạt	đạt	đạt	chưa đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt
15	15. BVHC Tân Phú Thuận tỉnh	chưa đạt	đạt	chưa đạt	chưa đạt	đạt	đạt	chưa đạt	đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	đạt	chưa đạt
16	16. BVHC Tân Phú Thành tỉnh	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt
17	17. BVHC Tân Phú Thuận tỉnh	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt
18	18. BVHC Tân Phú Thuận tỉnh	chưa đạt	đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt
19	19. BVHC Tân Phú Thuận tỉnh	đạt	chưa đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt	đạt
20	20. BVHC Tân Phú Thuận tỉnh	chưa đạt	chưa đạt	chưa đạt	chưa đạt	đạt	đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	chưa đạt	KAD	KAD	chưa đạt

Figure 2. Assessment Results under normal condition: Classification of Health facility based on its nine specific capacities/resources

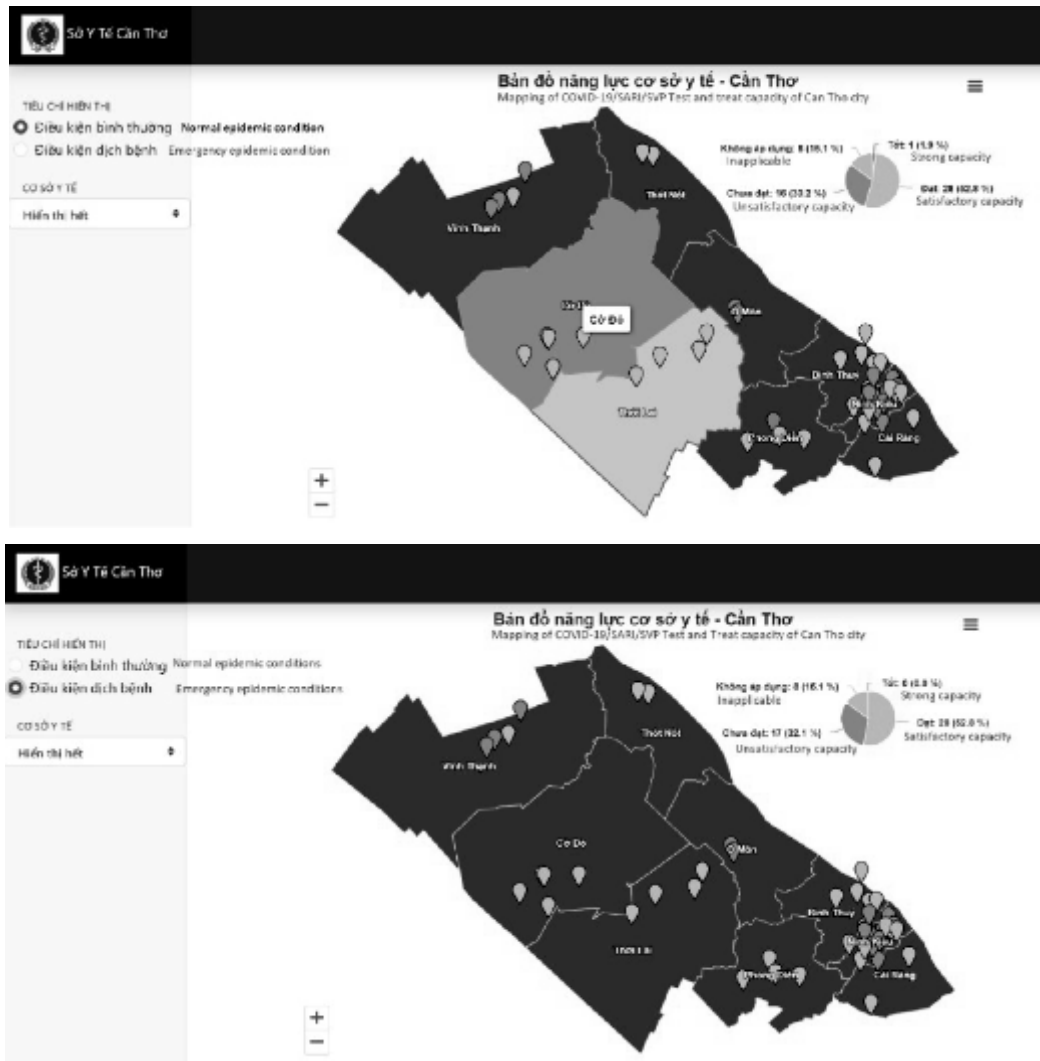


Figure 3. Map of COVID-19/SARI/SVP Testing and Treatment capacity in Normal and Epidemic Conditions

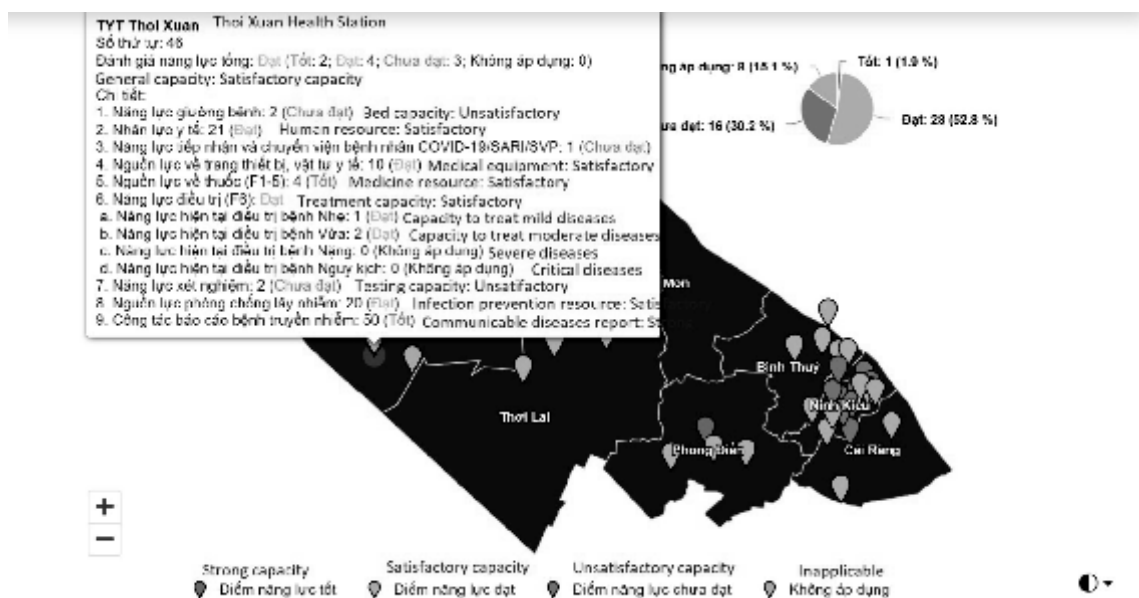


Figure 4. Assessment results: Testing and treatment capacity of one Health facility (Thoi Xuan Commune Health Station.)

5. CONCLUSIONS

In conclusion, the assessment of COVID-19/SARI/SVP testing and treatment capacity in Can Tho highlights significant gaps in healthcare facility preparedness, particularly concerning medicine and drug availability, testing capacity, treatment for critical cases, and bed capacity. These deficiencies emphasize the urgent need for targeted investments and strategic interventions to strengthen the healthcare system's resilience against future pandemics.

To address these shortcomings and enhance pandemic preparedness, some recommendations are proposed:

Investment in Medicine and Drug Resources: Urgent measures should be taken to improve the availability and accessibility of essential medicines and drugs in healthcare facilities. This may involve increasing procurement, optimizing supply chains, and enhancing distribution networks to ensure adequate stock levels during emergencies.

Enhancement of Testing Capacity: Efforts should focus on expanding and improving COVID-19 testing capabilities, including the deployment of rapid testing kits, the establishment of additional testing sites, and the training of healthcare personnel in efficient testing procedures.

Improvement of Treatment for Critical Cases: Strategies should be implemented to enhance

the capacity of healthcare facilities to manage severe and critical COVID-19 cases effectively. This may involve the provision of specialized training for healthcare professionals, the procurement of advanced medical equipment, and the establishment of dedicated treatment centers for critically ill patients.

Expansion of Bed Capacity: Steps should be taken to increase the availability of hospital beds, particularly in intensive care units, to accommodate the growing number of COVID-19 patients. This may require the conversion of existing facilities into temporary hospitals, the construction of field hospitals, and the mobilization of additional healthcare personnel to support patient care.

Regular Capacity Assessments: Regular assessments of healthcare facility capacity should be conducted to monitor progress, identify emerging challenges, and guide ongoing investments and interventions. These assessments should be integrated into routine healthcare planning and preparedness activities to ensure continuous improvement and readiness for future pandemics.

By implementing these recommendations and prioritizing investments in key areas, Vietnam can enhance its pandemic response capabilities and better protect the health and well-being of its population in the face of future pandemic.

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Nâng cao năng lực sẵn sàng ứng phó đại dịch COVID-19 (COVID-19/SARI/SVP): Đánh giá năng lực xét nghiệm và điều trị của các cơ sở y tế tại Thành phố Cần Thơ, Việt Nam năm 2023

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Hoàng Quốc Cường và Phạm Phú Trường Giang

TÓM TẮT

Việt Nam được xếp hạng trong 15 quốc gia bị ảnh hưởng nặng nề nhất bởi COVID-19 trong đại dịch 2021-2022 trên toàn cầu, ghi nhận tỷ lệ tử vong cao ở Thành phố Cần Thơ là 12,5 trên 1.000 ca, cao gấp hơn 3 lần so với mức trung bình quốc gia là 3,7. Một trong những nguyên nhân là do thành phố không đánh giá năng lực và đầu tư kịp thời cho hệ thống y tế. Nghiên cứu này đánh giá năng lực xét nghiệm và điều trị COVID-19 của các Cơ sở Y tế (CSYT) để cung cấp thông tin cho các kế hoạch đầu tư và nâng cao năng lực ứng phó đại dịch. Nghiên cứu được thực hiện vào tháng 9 năm 2023 trên 53/130 CSYT tại Cần Thơ, bao gồm các cơ sở y tế thuộc tuyến xã phường đến cấp thành phố, thuộc cả y tế công và tư. Đánh giá được thực hiện theo hai kịch bản: bình thường và dịch bệnh, trên 9 năng lực cụ thể bao gồm: số giường bệnh, nhân lực y tế, năng lực tiếp nhận bệnh nhân, năng lực điều trị bệnh nhân nhẹ/vừa/nặng/nguy kịch, nguồn thuốc, trang thiết bị và vật tư y tế, năng lực xét nghiệm, kiểm soát lây nhiễm, và báo cáo bệnh truyền nhiễm. Kết quả cho thấy, về năng lực tổng thể, trong tình hình bình thường, chỉ có 1.9% CSYT có năng lực mạnh, 52.8% có năng lực đạt và 30.2% có năng lực yếu. Ngược lại, trong kịch bản dịch bệnh, không có CSYT nào đạt năng lực mạnh, 52.8% có năng lực đạt và 32.1% có năng lực yếu. Khoảng 72% CSYT thiếu nguồn thuốc, 45% CSYT có năng lực xét nghiệm hạn chế, 42% CSYT cần tăng số giường bệnh và 43% gặp khó khăn trong điều trị các trường hợp nguy kịch. Việc đánh giá thường xuyên, đặc biệt khi số ca bệnh gia tăng bất thường, virus đột biến và độc lực gia tăng, đóng vai trò rất quan trọng

để có thông tin chính xác cho việc đầu tư và củng cố hệ thống y tế kịp thời. Triển khai đánh giá trên phạm vi toàn quốc sẽ hỗ trợ cho việc chủ động ứng phó với đại dịch xảy ra trong tương lai tốt hơn.

Từ khóa: COVID-19/SARI/SVP, sẵn sàng ứng phó đại dịch, xét nghiệm và điều trị, năng lực

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