INSTITUTO
UNIVERSITÁRIO
DE LISBOA

Hospital Management Strategy during COVID-19 Pandemic: a SWOTi approach on Mobile Cabin Hospital in China

Ruoxian Cui

Master of Business Administration

Supervisor:
Prof. Doutor Nelson Santos António, Full Professor at ISCTE University Institute of Lisbon Business School, Department of Strategy, Quality Management and Philosophy of Science

August, 2023

Department of Marketing, Strategy and Operations

Hospital Management Strategy during COVID-19 Pandemic: a SWOTi approach on Mobile Cabin Hospital in China

Ruoxian Cui

Master of Business Administration

Supervisor:
Prof. Doutor Nelson Santos António, Full Professor at ISCTE University Institute of Lisbon Business School, Department of Strategy, Quality Management and Philosophy of Science

August, 2023

Acknowledgements

With the completion of this dissertation, I would like to express my deep gratitude to all those who have extended a helping hand or accompanied me.

First and foremost, I extend my gratitude to my dissertation supervisor, Nelson Santos António. Your gentle guidance and sincere encouragement hold profound significance for me. I am truly fortunate to have had the privilege of being your student.

Next, I wish to convey my deep appreciation to my parents, who have consistently embodied the essence of exceptional parenthood. Their unwavering support and insightful counsel have welluminated my path, all while honoring my independent decision–making. Their devotion to caring for our elders and nurturing the next generation underscores their integrity and authentic values. They are the bedrock upon which I walk, nurturing within me an enduring optimism for the innate goodness of mankind.

Next, my heartfelt thanks extend to the friends who have journeyed beside me. Among them, I must reserve a special mention for Raquel Rego. Your engaging and witty conversations have enriched my growth and made the journey all the more exciting. Together, we have shared indelible moments while exploring the enchanting streets and charming eateries of Portugal. Also, to all those who have crossed my path, and to those who will continue to accompany me on this journey, I am profoundly indebted for your presence in my life.

Lastly, a message to my future self: stay brave, keep smiling. As you step forward into the unknown chapters that lie ahead, remember the resilience you've cultivated and the obstacles you've overcome. Embrace challenges with the same courage that has brought you this far, and let your smile be a reminder of the strength that resides within you. Continue to embrace growth, change, and the opportunities that await. May your journey be marked by determination, enthusiasm, and the unwavering belief that every challenge is a chance to shine brighter.

Abstract

This study employs the SWOT i (Strengths, Weaknesses, Opportunities, and Threats with sustainability integration) analysis approach to explore the hospital management strategies implemented by Mobile Cabin Hospitals in China during the COVID-19 pandemic. Emphasizing the incorporation of sustainable development into strategic decision–making, the study utilizes a combination of qualitative and quantitative research methods. The research centers on three representative Mobile Cabin Hospitals: Leishenshan Hospital, Shanghai World Expo Cabin Hospital, and Shijiazhuang Zhengding Convention and Exhibition Center Cabin Hospital. Data is collected and analysed through literature analysis, word frequency analysis of primary data, and questionnaire surveys. Mobile Cabin Hospitals exhibited significant strengths in the initial and middle stages of the pandemic, benefiting from specialized response teams, strict infection control measures, and government support, effectively controlling the pandemic and maintaining social order in China. However, challenges such as inadequate management coordination, employee psychological well-being concerns, and suboptimal responses to unforeseen situations were also observed. When assessing the role of Mobile Cabin Hospitals, a balanced approach considering long-term sustainability becomes crucial.

Key Words: Hospital Management, COVID-19 Pandemic, SWOT i Analysis, Sustainability, Crisis Management

JEL Classification System Code: I18 Government Policy; Regulation; Public Health; Q01 – Sustainable Development

Resumo

Este estudo emprega a abordagem de análise SWOT i (Forças, Fraquezas, Oportunidades e Ameaças com integração de sustentabilidade) para explorar as estratégias de gestão hospitalar implementadas pelos Hospitais Móveis de Cabine na China durante a pandemia da COVID-19. Enfatizando a incorporação do desenvolvimento sustentável na tomada de decisões estratégicas, o estudo utiliza uma combinação de métodos de pesquisa qualitativos e quantitativos. A investigação centra–se em três Hospitais Móveis de Cabine representativos: Hospital Leishenshan, Hospital de Cabine da Exposição Mundial de Xangai e Hospital de Cabine do Centro de Convenções e Exposições de Shijiazhuang Zhengding. Os dados são coletados por meio de análise de literatura, análise de frequência de palavras de dados primários e questionários. Os Hospitais Móveis de Cabine exibiram forças significativas nas fases iniciais e intermediárias da pandemia, beneficiando–se de equipes de resposta especializadas, rigorosas medidas de controle de infecção e apoio do governo, efetivamente controlando a pandemia e mantendo a ordem social na China. No entanto, também foram observados desafios, como coordenação inadequada na gestão, preocupações com o bem–estar psicológico dos funcionários e respostas subótimas a situações imprevistas. Ao avaliar o papel dos Hospitais Móveis de Cabine, uma abordagem equilibrada considerando a sustentabilidade de longo prazo torna–se crucial.

Palavras–Chave: Gestão Hospitalar, Pandemia de COVID-19, Análise SWOT i, Sustentabilidade, Gestão de Crises

Classificação JEL: I18 – Políticas Governamentais; Regulamentação; Saúde Pública; Q01 – Desenvolvimento Sustentável

Index

Chapter I – Introduction 1
1.1 Contextualization and definition of the research question .. 1
1.2 Importance and relevance of the research question 4
1.3 Statement of the research question and objectives 5
1.4 Dissertation structure 6
Chapter II – Literature Review 7
2.1 Introduction to hospital management strategies 7
2.2 The impact of COVID-19 on healthcare systems globally 9
2.3 Application of the SWOT Analysis Framework in Healthcare Management 11
2.4 Conceptual Model and Research Hypotheses 13
Chapter III – Methodology 16
3.1 Research Design and Approach 16
3.2 Data Collection Methods for the Selected Fangcang Hospitals 17
3.3 Data Analysis Techniques Employed 19
Chapter IV – Field Work (Contextualization) 21
4.1. The Impact of COVID-19 on Healthcare Systems in China 21
4.2 Importance of Effective Hospital Management Strategies for Cabin hospital during Pandemics 23
4.3 Evaluating the Potential of Cabin Hospitals for Pandemic Response 25
Chapter V – Results and Discussion 26
5.1 Overview of the Research Findings for the Selected Fangcang Hospitals 26
5.2 SWOT i Analysis of the Fangcang Hospitals: Strengths, Weaknesses, Opportunities, and Threats 39
5.3 Contributions of the Study to Existing Theory on Pandemic Response 43
5.4 Practical Implications and Recommendations for Fangcang Hospital Management 45
Chapter VI – Conclusions and Recommendations 47
6.1 Summary of the Research Findings 47
6.2 Limitations of the Study 49
6.3 Suggestions for Future Research in the Field 51
6.4 Recommendations for Effective Hospital Management during Pandemics 52
Annexes 60
A- Questionnaire on Fangcang Hospitals around Shijiazhuang and Results 60

Index of figures

2.4 Figure 1 SWOT i.....29
5.1 Figure 1 Part of Speech Count.....42
5.1 Figure 2 Part of Speech percentage.....42

Index of tables

4.3 Table 1: Overview of Mobile Cabin Hospitals.....39
4.3 Table 2: Evaluation of Mobile Cabin Hospitals.....40
5.1 Table 1: List of Most Frequently Occurring Singular Nouns.....44
5.1 Table 2: List of Most Frequently Occurring Plural Nouns.....45
5.1 Table 3: List of Most Frequently Occurring Plural Nouns.....46
5.1 Table 4: List of Most Frequently Occurring Adverbs.....47
5.1 Table 5: List of Most Frequently Occurring Base Form Verbs..... 48

Chapter I – Introduction

1.1 Contextualization and definition of the research question

COVID-19, a pandemic disease caused by the SARS–CoV–2 virus and first identified in 2019, has had a profound global impact, presenting significant challenges to healthcare systems. By July 2023, the virus had infected over 767 million individuals and caused 6.94 million deaths worldwide (World Health Organization, 2023). Resource–constrained countries are particularly vulnerable due to inadequate healthcare infrastructure, understaffing, and systemic gaps in healthcare provision. In these nations, healthcare workers often face the challenging situation of treating patients without proper Personal Protective Equipment (PPE). This lack of PPE puts them at a high risk of contracting the SARS-CoV-2 virus. Moreover, in regions with high population densities, healthcare systems have struggled to cope with the surge in the number of COVID-19 patients.

For example, hospitals in densely populated urban areas have been overwhelmed with COVID-19 patients, leading to overwhelmed hospitals, shortages of medical supplies and hospital beds, and a strain on resources. These challenges have exposed the vulnerabilities and unsustainable of healthcare systems, and it is crucial to develop effective response strategies that can efficiently stop the spread of the virus and improve healthcare systems in the future.

To explore the role of Chinese Cabin hospitals (Fangcang hospitals) during the COVID-19 pandemic, it is necessary and essential to first understand the development of COVID-19 in China. The first case of COVID-19 was reported in Wuhan, China on December 1st, 2019. According to a retrospective study by Huang et al. (2020), during the early stage of the outbreak, the disease control center concentrated suspected cases in isolation at the Jinyintan Hospital in Wuhan, collected samples and data, and the earliest data sample was collected on December 16, 2019. On December 26, 2019, respiratory and critical care physician Zhang Jixian discovered and reported the unknown cause of pneumonia, suspecting it to be a communicable disease. On

December 27, 2019, Guangzhou Iiyuan Gene Technology Company assembled an almost complete virus genome sequence and shared the data with the Institute of Pathogen Biology at the Chinese Academy of Medical Sciences. On January 11, 2020, the Chinese Academy of Medical Sciences submitted the data to the Global Initiative on Sharing All Influenza Data (GISAID) website, and this analysis was the earliest sample collection date in the database. On December 31, 2019, the Wuhan Municipal Health Commission confirmed the authenticity of the file to the media and released a situation report, announcing 27 cases to the public. The Chinese government also reported the situation to the World Health Organization on the same day. As experts, scholars, and government agencies continued to deepen their understanding of COVID-19, this highly infectious disease continued to spread outward, with Wuhan as the center. On January 23, 2020, Wuhan began to implement the "Class A Infectious Disease Blockade Measures" stipulated in Article 42 of the "Infectious Disease Prevention and Control Law". The Wuhan Epidemic Prevention and Control Command issued a notice announcing the lockdown on January 23, 2020, and as of 10 a.m. that day, public transportation in the city was suspended, and some highway exits in Hubei Province were closed by the afternoon. On January 24, 2020, 30 provinces, regions, and cities in mainland China successively launched a level I public health emergency response to this major public health event. From this point on, COVID-19 officially entered a period of strict control in China.

I divided the activities of COVID-19 in China into three periods:

1.Early Stage (January 2020 – March 2022):

During this period, the virus spread outward from Wuhan. The government and the people gradually realized the outbreak of COVID-19 and took measures to control its spread. This period included the initial spread in the first half of 2020, sporadic outbreaks from June 2020 to March 2021, and a large–scale vaccination campaign from 2021 to March 2022.

2.Mid–stage (March 2022 – November 2022):

In March 2022, with the widespread transmission of the SARS–CoV–2 Omicron variant, the number of locally transmitted asymptomatic cases in mainland China

gradually surpassed the number of confirmed cases. The virus started spreading on a large scale for the second time.

3.Late Stage (December 2022 – Present):

Since December 2022, the government has been progressively easing COVID-19 restrictions, leading to a significant surge in cases that rapidly reached its peak, followed by a gradual return to normalcy.

Mobile cabin hospitals have been one of the key measures taken by China to control the COVID-19 pandemic. They were initially implemented in Wuhan and gradually expanded to other parts of China.

According to Shang, Xu, and Cao (2020), Cabin hospitals (Fangcang shelter hospitals) have played a crucial role during previous infectious disease outbreaks and natural disasters. Mobile cabin hospitals are commonly utilized to address healthcare resource shortages. However, due to their relatively limited capacity, they face challenges in effectively responding to the exponential growth of COVID-19 cases. The initial establishment of Fangcang hospitals in Wuhan, China aimed to curb the spread of COVID-19 and provide timely basic medical services to patients. These hospitals in China are rapidly constructed or typically converted from large public facilities, such as stadiums and exhibition centers, within a short period of time. This facility provides a large number of beds to accommodate patients with mild to moderate COVID-19 symptoms. The primary functions of Fangcang hospitals include isolation, triage, basic medical care, frequent monitoring, and rapid referrals. Besides their role as medical establishments, the Fangcang hospitals in China extend their support to COVID-19 patients by providing them with food, accommodation, and opportunities for social engagement. These cabin hospitals prioritize the isolation of patients and potential cases, thereby minimizing the risk of virus transmission within households and communities.

To analyze the effectiveness of Fangcang hospitals in the prevention and treatment of COVID-19 in China, three representative hospitals were selected.

The Leishenshan Fangcang Hospital in Wuhan was the first hospital chosen for the research. Its construction commenced on January 25, 2020, and reached

completion within a mere twelve days on February 5, 2020. Strategically positioned in the outbreak's epicenter, Wuhan, the hospital was rapidly built through effective government leadership and close coordination with China Construction Group, successfully mobilizing social resources and ensuring the efficient construction of the hospital.

The second hospital is the Fangcang facility, located at the Shanghai New International Expo Center. This facility underwent a transformation from a large exhibition center and is situated in Shanghai, a prominent financial hub. It was operational during the period from April 4th, 2022, to June 14th, 2022, coinciding with the easing of restrictions in Shanghai.

For the later period, an example is the Fangcang hospital in the vicinity of Shijiazhuang, the capital city of a northern province in China. This hospital was selected for its data accessibility for the researcher.

These three Fangcang hospitals represent the characteristics and features of Fangcang hospitals in different time periods and geographic locations in China.

1.2 Importance and relevance of the research question

The COVID-19 pandemic is the first global infectious disease outbreak that has swept the world since the advent of modern society. In responding to this pandemic, the healthcare systems of every country have faced significant challenges, and the socio–economic impact has been felt to varying degrees. It is crucial to study and analyze the effectiveness and drawbacks of the measures taken during this pandemic. The human society needs to learn from the experience and lessons of this crisis.

Fangcang hospitals in China represent an emerging model of epidemic response and have been a key measure in the fight against COVID-19. Studying and analyzing the management of Fangcang hospitals can help us accumulate experience and guidance for future epidemic prevention and disease treatment. It enables the world to gain a better understanding of how to allocate medical resources more effectively and reasonably when facing a shortage, how to maximize the utilization of limited

medical resources, how to improve the quality of medical resource provision, reduce treatment costs, and achieve the maximization of social public interests while considering individual needs.

Now is the best time to study China's Fangcang hospitals. The COVID-19 epidemic has basically ended, and the Chinese government has announced the lifting of restrictions. Fangcang hospitals have either completed their mission and closed down or restored their previous social functions. During the initial and intermediate phases of the epidemic, the understanding and comprehensive evaluation of the role and effectiveness of Fangcang hospitals in China were limited. This can be attributed to the evolving nature of the outbreak, which hindered a complete understanding of the impact of Fangcang hospital construction and management. Additionally, during the early and middle stages, the scope of the epidemic's coverage was not extensive enough to provide a comprehensive assessment. The management strategies were not clearly defined, which is not conducive to a comprehensive understanding of the issues. Waiting a few more years to conduct the research would result in greater difficulties in collecting and analyzing epidemic data and information. The analysis of epidemic data is time–sensitive, and currently, it is easier to find firsthand witnesses whose memories are still vivid and largely unaltered. Waiting longer would make it harder to find firsthand witnesses, and when their memories become blurred, their narratives might be influenced by biased news reports absorbed by their minds. This could affect the quantity and authenticity of data collection, making authenticity even more challenging. Moreover, the social reports that are currently available may have already disappeared in the vast ocean of internet information by then, making data collection more difficult. The current timeframe is the best period for conducting this research.

1.3 Statement of the research question and objectives

The primary research question of this study is: What was the extent to which mobile cabin hospitals implemented in China during the COVID-19 pandemic achieved the

maximization of social and public benefits and maintained effectiveness throughout the entwere duration? Understanding the role and effectiveness of Fangcang hospitals in the context of the COVID-19 pandemic can provide valuable insights and references for future epidemic prevention and control efforts. To analyze this question, the objectives of this study are as follows:

1. Analyze the construction and operation of Fangcang hospitals during different periods and compare the differences better these periods.
2. Explore the advantages and disadvantages of Fangcang hospitals, analyzing their roles and impacts during different phases of epidemic control.
3. Evaluate the contribution of Fangcang hospitals to patient treatment and medical resource allocation during epidemic control, analyzing their influence on hospital operations and management.
4. Provide recommendations for the construction and operation of Fangcang hospitals in future epidemic prevention and control efforts, aiming to better utilize and optimize this strategy.

1.4 Dissertation structure

Structured systematically, this dissertation tackles the research question and objectives through well–arranged chapters. Chapter I introduces the pandemic–focused hospital management topic, its relevance, and outlines the research question and objectives. In Chapter II, I will delve into methodology, exploring hospital strategies and COVID-19's global impact. I will then analyze the SWOT framework's healthcare application and establish research hypotheses. Chapter III details the chosen research approach, including data collection from Fangcang hospitals and analysis techniques. Chapter IV contextualizes COVID-19's impact on China's healthcare, emphasizing effective hospital strategies and evaluating cabin hospitals' pandemic response potential. Transitioning to Chapter V, I will present findings from selected Fangcang hospitals, conduct a comprehensive SWOT analysis, and discuss contributions to pandemic response theory. Practical implications and

recommendations for Fangcang hospital management are also addressed. Concluding in Chapter VI, I will summarize findings, recognize limitations, propose future research directions, and provide practical hospital management recommendations during pandemics. This structured journey advances scholarly understanding and practical strategies in pandemic–responsive hospital management.

Chapter II – Literature Review

2.1 Introduction to hospital management strategies

Regarding strategic management, there have been numerous systematic analyses. Strategic management is the art and science of formulating, implementing, and evaluating decision–making processes that ensure organizational goals are achieved and surpass functional boundaries (David, 2011). It is a comprehensive management approach that integrates internal management, marketing, finance and accounting, production and operations, research and development, and computer information management systems to drive organizational success. Strategic management was initially proposed in the 1950s and gained wide popularity from the mid–1960s to the mid–1970s. However, during the economic growth, various strategic management models failed to deliver higher returns to organizations, leading to a decline in the popularity of strategic management in the 1980s. Since the 1990s, strategic management has experienced a resurgence and has seen new developments in recent years, becoming a mature branch of management widely applied in today's business world.

The development of corporate strategic theory can be broadly categorized into three stages (Ferlie, 2022): the early stage of strategic thinking, the classical strategic theory stage, and the competitive strategic theory stage. In the early stage, a complete strategic theory system did not emerge, but some remarkable strategic thoughts were presented. In the second and third stages, four representative schools of thought emerged: the design school, the structural school, the competence school, and the resource school.

Corporate strategic management is a product of the further development of production socialization and the commodity economy, and healthcare organizational strategic management is derived from corporate strategic management. According to Ginter et al. (2018), commonly used indicators for analyzing healthcare organizational strategic management include external analysis, service area competitor analysis, internal analysis, and competitive advantage.

Ginter et al. (2018) argue that in external analysis, they typically analyze the general environment, healthcare system, service area, and the organization. The purpose of external analysis is to identify and categorize the external changes that affect the organization. External sources of information include individuals, organizations, databases, and publications. During this process, organizations attempt to detect and analyze existing, ongoing, and future issues, which will be used for internal analysis. However, external analysis has certain limitations. It cannot predict the future or capture all changes, and some information may be unknown to researchers or organizations. Furthermore, organizations may not be able to respond quickly or completely avoid personal biases of managers. Service area competitor analysis is a more specific process aimed at understanding the nature of competition. In the healthcare system, new competitive markets are emerging (Dafny, 2016), and healthcare organizations must develop new and more competitive healthcare delivery models. Ghoshal and Istney argue that an organized competitor intelligence system is essential for survival, as stated by Ghoshal and Istney (1991). This analysis process involves understanding the market and assessing competitors within the market. Michael Porter identified several strategic dimensions from the service area, including specialization, reputation, service/product quality, technological leadership, vertical integration, cost position, service and price policy, and the relationship with the parent company (Belton, 2017). Potential barriers in service area competitor analysis include misjudging boundaries, poor competitor selection, excessive focus on geography rather than competition, and failure to fully identify competitor activities. Understanding the external competitive environment, including the general environment, healthcare environment, and competitors, forms the foundation for

strategic management and survival.

Internal analysis and competitive advantage are crucial. Understanding competitive advantage requires a thorough internal analysis of the organization through its value chain. The value chain is divided into two major components: the delivery of health services and support activities. By investigating the value chain and assessing resources, competencies, and capabilities, it becomes possible to identify strengths and weaknesses more effectively. Evaluation based on the value, rarity, imitability, and sustainability of strengths or weaknesses is then conducted. The identification of competitive advantages and disadvantages related to competition provides a foundation for formulating strategies to achieve competitive advantage (Almquist, Senior, & Bloch, 2016).

To further support this, Kumar, Jones, Venkatesan, and Leone (2011) highlight that market orientation can serve as a source of sustainable competitive advantage. This emphasizes the importance of understanding customer needs and preferences to maintain a competitive edge. By aligning internal capabilities with market demands, organizations can effectively differentiate themselves from competitors and achieve long-term success (Kumar et al., 2011).

In summary, a careful internal analysis and understanding of competitive advantage through the value chain, along with a focus on market orientation, provide the basis for achieving competitive advantage in the healthcare industry.

2.2 The impact of COVID-19 on healthcare systems globally

The global healthcare system has been primarily impacted by COVID-19 in four areas: healthcare resources, healthcare personnel, patient care processes and healthcare service models, and the resilience of health security systems.

During the early stages of the pandemic, scholars have already proposed that COVID-19 could present extraordinary and sustained demands on public health, healthcare systems, and basic community services (Emanuel et al., 2020). As the pandemic has unfolded, these viewpoints have been validated.

In terms of healthcare resources, the COVID-19 pandemic has placed tremendous pressure on medical facilities such as hospitals and clinics. The high volume of cases has resulted in a shortage of healthcare resources, including beds, ventilators, and other critical equipment. Even in developed countries, concerns have arisen that healthcare systems may become overwhelmed if there is a sharp increase in COVID-19 cases. For example, in the United States, there has been a shortage of N95 masks, leading to the need for reusing such disposable masks (Grinshpun et al., 2020). In Italy, ventilators and ICU beds were only available to critically well patients during the peak of the disease (Remuzzi et al., 2020). South Korea faced a shortage of hospital beds, resulting in many fatalities (Kim et al., 2020).

Furthermore, there has been a severe shortage of healthcare personnel. Some countries already had insufficient healthcare staff to meet normal disease demands, and the current pandemic has exacerbated this dilemma. Once practice population numbers were included (Rubin et al., 2020) find that the top 33% of GP practices supporting 45% of the patient population would require 68% of COVID-19 healthcare resources. The sudden increase in the number of patients requiring treatment or hospitalization has stretched the capacity of healthcare personnel, who have been working long hours without adequate protection. This has further reduced the number of healthcare personnel available, affecting the effective treatment and care of patients. Studies have indicated that the COVID-19 pandemic has had an impact on the mental health of healthcare workers, which in turn affects the quality of healthcare. In Wuhan, China, where frontline healthcare workers in the Fangcang hospitals were predominantly female, it was found that during the COVID-19 pandemic, some frontline healthcare workers experienced mental health issues such as depression and anxiety. Survey results showed that among 276 frontline healthcare workers in the Wuhan region, the prevalence of anxiety disorders was 27.9%, and the prevalence of depression was 18.1% (Zhang et al., 2020). (Panzeri et al., 2021) conducted a two–step study that examines psychological differences among healthcare workers at a rehabilitation institute during the COVID-19 pandemic, aimed at developing a new assessment tool to measure psychological distress and esteem in healthcare workers

during the COVID-19 pandemic. (Leigh et. al., 2021) investigate physicians' perceptions and experiences of caring for critically well patients in the context of actual or anticipated resource strain during the COVID-19 pandemic and explore implications for the healthcare workforce and the delivery of patient care. The COVID-19 pandemic has had a significant impact on the physical and mental health of healthcare workers.

At the same time, there have been changes in patient care processes and healthcare service models. To reduce the risk of disease transmission, many healthcare institutions have implemented new measures such as telemedicine and online consultations to provide necessary medical services to patients. Platforms and healthcare services offering remote consultations have been established in countries like the United States, Europe, Indonesia, the Philippines, and China (Kuang, 2022).

This shift has, to some extent, improved the convenience of healthcare services and effectively reduced contact between patients and healthcare personnel. However, due to societal cultural values and high barriers, traditional offline healthcare services still hold their ground and remain dominant.

Additionally, the pandemic has exposed the resilience of health security systems. Many countries' healthcare systems have faced challenges in responding to and managing the outbreak of a large–scale infectious disease. This has sparked calls for the reassessment and improvement of health security systems to enhance their crisis response capabilities.

In summary, the COVID-19 pandemic has had profound effects on the global healthcare system.

2.3 Application of the SWOT Analysis Framework in Healthcare Management

SWOT, which stands for strengths, weaknesses, opportunities, and threats, has evolved into a key tool for improving decision–making in complex strategic situations by reducing information overload.

This analysis framework is widely applied in various fields, including healthcare.

When used to evaluate healthcare institutions, SWOT analysis offers a systematic approach to assessing internal and external factors that can influence organizational performance and strategic decision–making. Numerous research studies have provided evidence of the effective utilization and development of SWOT analysis in healthcare management.

For example, Elnajjar et al. (2020) conducted an analysis of factors and provided recommendations on decision–making in healthcare. Building upon previous work and employing SWOT analysis, which encompasses the market environment and health data opportunities, they designed a set of health information services.

Similarly, Sun et al. (2022) employed the SWOT analysis technique to comprehensively evaluate the current situation of influenza vaccination among grassroots healthcare workers. They established a SWOT analysis matrix, which facilitated a thorough assessment of strengths, weaknesses, opportunities, and threats.

In another study, J. Wang and Z. Wang (2022) applied SWOT analysis to evaluate China's Prevention and Control Strategy for the COVID-19 Epidemic. Their analysis identified areas for improvement within the strategy. The weakness–opportunity (WO) strategy included formulating a health emergency response system for major infectious diseases during holidays, establishing health emergency specialty and emergency management departments at universities, and developing a public health emergency management system and code of conduct. The weakness–threat (WT) strategy involved strengthening psychological interventions for the public, formulating industry–specific plans for returning to work, increasing support for health emergency education, and promoting mobile work during major infectious disease outbreaks. Through an in–depth analysis, they prioritized reshaping the health emergency system, establishing health emergency departments in universities and all institutions, adjusting the economic structure and strengthening international and domestic linkages, and enhancing public intervention in responding to public health emergencies.

The application of SWOT analysis in healthcare management has numerous advantages. It provides a structured framework to assess an organization's internal

capabilities and limitations, allowing managers to leverage strengths and address weaknesses effectively. SWOT analysis also helps identify external opportunities for growth and potential threats that may impact the organization. However, it is important to acknowledge the limitations of SWOT analysis, such as a lack of consideration for sustainability.

Pereira et al. (2021) raised a new approach to SWOT analysis, referred to as "SWOT i," with sustainability as one of its core pwellars. The SWOT i framework goes beyond the traditional analysis of strengths, weaknesses, opportunities, and threats by emphasizing the consideration of sustainability factors in decision–making processes. It recognizes that the value and impact of every strategic decision should be assessed from a sustainability standpoint. This means that companies using the SWOT i approach consider not only the short–term benefits and risks but also the long-term implications for environmental, social, and economic sustainability. By incorporating sustainability into the SWOT analysis, the SWOT i framework aims to assist companies in developing strategies that are responsive to emerging trends while remaining competitive in the market. It encourages organizations to identify opportunities that align with sustainability goals and address potential threats that may arise from unsustainable practices. Moreover, the SWOT i approach prompts companies to leverage their strengths in sustainable practices and address weaknesses that may hinder their ability to achieve sustainability objectives.

Nonetheless, SWOT analysis remains a valuable tool for healthcare managers to make informed decisions and improve organizational performance.

2.4 Conceptual Model and Research Hypotheses

The SWOT (Strengths, Weaknesses, Opportunities, and Threats) model is widely recognized as a framework for analyzing internal and external factors that impact the performance and outcomes of organizations or projects. In the context of healthcare research, the SWOT model provides a structured approach to understanding the strengths and weaknesses of healthcare concepts and the opportunities and threats

they face within their operational environment. It allows for the assessment of an organization's internal capabilities and limitations.

Healthcare managers can obtain a competitive advantage by leveraging their existing resources and competencies by identifying their strengths. In a similar vein, acknowledging their shortcomings helps them deal with problem areas and manage resources well. Additionally, SWOT analysis assists healthcare businesses in recognizing opportunities outside of their own walls that may be leveraged, such as new trends in the market, developments in technology, or possible joint ventures. In addition, it makes it possible to recognize possible risks like alterations in regulations, competitive pressures, or budgetary limitations, giving managers the opportunity to create risk–reduction plans that are suitable.

However, the traditional SWOT model does not consider the assessment of an important influencing factor, sustainability. Many of the challenges faced by healthcare institutions during the COVID-19 pandemic were due to a lack of resilience, leading to potential paralysis when patient numbers exceeded capacity. To address this limitation, the SWOT i model, also known as SWOT ISCTE Business School (Pereira et al., 2021), offers a new adaptation of the traditional SWOT analysis.

Developed by the strategy team at ISCTE Business School, SWOT i is a modified version of the SWOT analysis that incorporates strategic pillars and emphasizes the consideration of values and sustainability in decision–making. This model aims to provide a more rigorous analysis of an organization's operational model, ensuring that decisions align with the established strategic framework and values. By placing values at the center of strategic formulation, SWOT i compels organizations to consider sustainability and other relevant factors in their decision–making process.

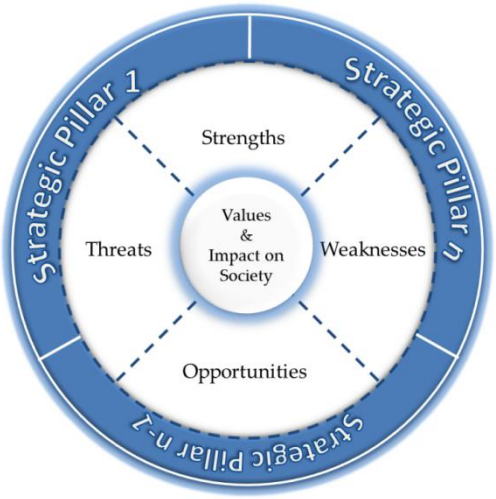


Figure 2.4 SWOT i

Source: Adapted from (Pereira et al., 2019)

In the context of studying Fangcang hospitals in China during the COVID-19 period, I have chosen the SWOT i model as the conceptual framework. It is suitable for assessing the multiple aspects of this unique healthcare concept. Fangcang hospitals in China were temporary facilities established by transforming exhibition centers, sports stadiums, and other venues to centralize the treatment of mild COVID-19 patients during the outbreak. I have selected three hospitals from different time periods for analysis.

By applying the SWOT i model, the aim is to focus on sustainability and gain a comprehensive understanding of the internal attributes and external factors that influence the effectiveness and public impact of Fangcang hospitals during different time periods. The intention is to elucidate the nuanced dynamics surrounding Fangcang hospitals, exploring whether they consistently fulfill their role in pandemic prevention and control, and challenging assumptions that they are always beneficial to the public. By rigorously examining the strengths, weaknesses, opportunities, and threats associated with Fangcang hospitals, I can gain insights into their potential limitations, risks, and necessary improvements for optimizing their impact on public health.

This study seeks to facilitate broader discussions on emergency medical service

models during pandemics and provide policymakers, healthcare professionals, and stakeholders with an understanding of the potential benefits and challenges of Fangcang hospitals. By employing the SWOT i model, I can explore the intricate interactions between internal and external factors, thus gaining a more comprehensive understanding of the impact of Fangcang hospitals on the public.

Chapter III – Methodology

3.1 Research Design and Approach

This section presents the research design and methods used to analyze hospital management strategies during the COVID-19 pandemic, with a specific focus on cabin hospitals in China. The study aims to conduct a comprehensive SWOT i (Strengths, Weaknesses, Opportunities, and Threats with Sustainability Integration) analysis to evaluate the effectiveness of these hospitals in responding to the outbreak.

To achieve this goal, a mixed research method was employed to collect relevant data and insights. The selected cabin hospitals for analysis include the Leishenshan Cabin Hospital in Wuhan, the Cabin Hospital at the Shanghai New International Expo Center, and the Zhengding Convention Center Cabin Hospital near Shijiazhuang in Hebei province. These three hospitals represent typical Cabin facilities that differ in terms of their location (early, middle, and later stages of the outbreak), geographical position (the city where the outbreak first occurred, a major international metropolis in China, and a provincial capital in northern China), and size.

The analysis of the Leishenshan Cabin Hospital involved a comprehensive review of news articles, academic publications, and documentary sources. This approach, which included a thorough examination of relevant literature and media reports, provided valuable insights into the hospital's construction and operational timelines, as well as its overall impact on public health during the pandemic.

For the analysis of the cabin facility at the Shanghai New International Expo Center, data was gathered from online sources, including a detailed firsthand account

from an individual who documented their experience in a blog. This data was analyzed using quantitative methods, specifically a word frequency analysis. This approach provides valuable insights into the operational timeline and effectiveness of the facility in managing the surge in COVID-19 cases in Shanghai.

To conduct a comprehensive analysis of the Cabin hospital near Shijiazhuang, a combination of questionnaire surveys and quantitative analysis was employed to assess patients' perceptions and experiences of the facility. The survey aimed to collect quantitative feedback on facility management strategies, provided services, and overall patient satisfaction during hospitalization. This data collection method is used for the collection of data on variables such as satisfaction with medical services, living conditions, and willingness to undergo isolation in the cabin hospital. The collected data was then subjected to quantitative analysis using statistical methods to derive meaningful insights and draw conclusions. The findings from this multidimensional approach provide a more comprehensive understanding and accurate evaluation of the performance and effectiveness of cabin hospitals in the given context.

The combination of these research methods enables a comprehensive evaluation of the selected cabin hospitals from different perspectives. The collected data will be analyzed using the SWOT i analysis to identify the sustainability, strengths, weaknesses, opportunities, and threats associated with the hospital management strategies implemented during the COVID-19 pandemic.

By employing a mixed–method approach and utilizing the SWOT i analysis framework, this study aims to provide valuable insights into the effectiveness of Cabin hospitals as management strategies during the COVID-19 pandemic in China. The research findings will contribute to the understanding and improvement of hospital management strategies in preparation for and response to future pandemics.

3.2 Data Collection Methods for the Selected Fangcang Hospitals

In order to collect comprehensive and reliable data, a mixed research method was

employed, combining qualitative and quantitative research techniques. The selection of data collection methods was tailored to the specific characteristics and ease of data acquisition for each identified cabin hospital.

To analyze Leishenshan Cabin Hospital, a comprehensive data collection approach was used. This included conducting a literature review encompassing academic articles, research surveys, media reports, and relevant studies conducted by researchers. This approach enabled a thorough examination of various sources of information. Given Leishenshan Cabin Hospital's significant role in the early stages of cabin hospital construction and its prominence in the academic community, ample official reports, academic articles, and research studies were available for review. Additionally, news analysis was incorporated to gain insights from media reports and online sources. By leveraging existing academic literature, research surveys, media reports, and relevant studies, a comprehensive understanding of Leishenshan Cabin Hospital's construction timeline, operational period, and overall impact on public health during the pandemic was achieved.

For data collection regarding the Shanghai New International Expo Center cabin hospital, information was gathered from online resources, particularly firsthand accounts, and an analysis of social news. Due to the rapid construction and limited availability of official reports from the Chinese government, reliance on social reports and online resources was necessary, with a focus on verifying their authenticity. To gain insights into this hospita’s operation and its effectiveness in managing COVID-19 cases in Shanghai, a detailed firsthand account was selected from an individual who had received medical care in this cabin hospital. This firsthand account provided valuable information and perspectives on the facility's operation, challenges faced, and its impact on managing the COVID-19 outbreak in Shanghai. By leveraging these alternative sources and employing rigorous verification methods, an effort was made to gather as much reliable and comprehensive data as possible regarding the Shanghai New International Expo Center cabin facility. This approach aimed to compensate for the limitations in official reports and provide a nuanced understanding of the facility's operation and its effectiveness in handling the surge of COVID-19 cases in Shanghai.

To conduct a comprehensive analysis of the cabin hospitals near Shijiazhuang, a questionnaire survey and quantitative analysis were employed. The questionnaire survey aimed to collect the opinions and experiences of admitted patients regarding the cabin hospital and evaluate facility management strategies, services provided, and overall satisfaction during hospitalization. As the data was situated near the researcher's hometown and the cabin hospital treated a significant number of students from Hebei Normal University and Hebei University of Science and Technology, the collection of questionnaire data was facilitated. Additionally, interviews were conducted to gain in–depth insights and perspectives from firsthand witnesses.

The questionnaire survey was designed to cover various topics and questions, including multiple–choice questions, rating scale questions, and open–ended questions, aiming to comprehensively collect patients' feedback and opinions. In designing the questionnaire, relevant studies and hospital evaluation tools were referred to, ensuring the effectiveness and credibility of the questions.

By employing these multi–faceted data collection methods, diverse information was gathered for a comprehensive analysis of the selected cabin hospitals to assess their performance.

3.3 Data Analysis Techniques Employed

The data collected from the selected cabin hospitals was analyzed using a combination of qualitative and quantitative research techniques.

A qualitative study was conducted for the first selected cabin hospital, Leishenshan Fangcang Hospital. It involved analyzing official information, relevant social news, and previous studies related to Leishenshan Cabin Hospital. The analysis included reviewing and categorizing the information based on attitude inclination and design content to identify recurring themes, patterns, and insights relevant to the hospital's operations, patient experiences, and overall effectiveness. The aim was to provide detailed descriptive information and present a comprehensive depiction of Leishenshan Cabin Hospital.

For the second selected cabin hospital, the Shanghai Expo Center Fangcang Hospital was selected as the site. This hospital was established by transforming the international exhibition center. During the mid–stage of the pandemic, the cabin hospital played a significant role in Shanghai and was one of the largest cabin hospitals at that time. To portray individuals' firsthand experiences at the cabin hospital comprehensively, I conducted a word frequency analysis on a selected case. Initially, I aimed to collect lots of online data, primarily from Sina Weibo, China's major social media platform. However, the process encountered obstacles. Utilizing advanced search features, I focused on Iibo content related to the Shanghai New International Expo Center Cabin Hospital between March 26th and May 5th, 2022. Surprisingly, few non–official personal accounts covered the cabin hospital, prompting a shift towards analyzing firsthand accounts. I chose a record from an individual who underwent notification, quarantine, and eventual discharge at the Shanghai New International Expo Center. This person, identified as "Original zhuyi HomeBistro," published an article titled *2022 Shanghai Outbreak, 21–day Quarantine from Ruijin North to Expo Cabin* on April 12th, 2022, at 14:45. This choice was driven by the article's detailed portrayal of the individual's quarantine experiences and emotions during his stay at the Shanghai Expo Cabin Hospital, substantiated by ample photographic evidence. Analyzing this record offers an immersive grasp of the quarantine environment, the Shanghai Expo Cabin Hospital's realities, and the individual's insights throughout the process. To begin, I organized the collected data and then translated the text into English using Google Translate. Subsequently, I utilized the data analysis software SPSS for the word frequency analysis. During the selection process, I chose to analyze only the words with a frequency greater than 10, focusing on nouns, adverbs, adjectives, and plural nouns based on their part of speech. This process yielded a total of 81 words, and the specific results will be presented in the "Chapter V–Results and Discussion" section.

For the third selected hospital, the Shijiazhuang Zhengding Exhibition Center Cabin Hospital, questionnaires were distributed to collect data. The questionnaires were administered through an online survey platform, ensuring convenient and

efficient data collection. Participants were provided with a survey link and were able to remotely access and complete the questionnaire. The online survey questionnaire consisted of multiple sections and questions, aiming to gather information related to hospital performance, patient experiences, overall satisfaction, and preferences regarding isolation methods. The survey covered topics such as the quality of medical services, efficiency of facility management, and patient satisfaction during their hospitalization. To enhance response rates and ensure data quality, measures were taken to encourage participation and maintain the anonymity and confidentiality of respondents. The questionnaire was designed to be simple and clear, ensuring that participants understood the purpose of the survey and how to accurately answer the questions. Once the data collection period concluded, the collected survey results were exported and compiled for further analysis. The data was securely stored, accessible only to the researcher, to maintain the confidentiality and integrity of the information. This online survey management approach provided broader coverage and convenience, ensuring diverse perspectives and experiences. The collected data from the questionnaires formed a valuable analytical dataset, providing an in–depth understanding of the performance and patient perspectives of the third selected hospital.

The choice of data analysis techniques for each cabin hospital was driven by several factors, including the nature of the collected data, research objectives, and available resources. By tailoring the analysis methods to these specific considerations, I aimed to optimize the quality and depth of the findings.

Chapter IV – Field Work (Contextualization)

4.1. The Impact of COVID-19 on Healthcare Systems in China

In China, the impact of COVID-19 on the healthcare system has been multifaceted and far–reaching.

The sudden surge in COVID-19 cases strained China's healthcare infrastructure.

World Bank data from 2011 indicated that there were 0.8 primary healthcare workers per 1,000 people in China. Despite its large population, China's average healthcare resources were not sufficient. Prior to the pandemic, healthcare resources in China already faced contradictions due to regional distribution imbalances. The outbreak of COVID-19 further exacerbated this conflict. Hospitals experienced an influx of a large number of patients, pushing their capacities to the limit and exacerbating shortages of beds, medical equipment, and healthcare personnel.

To meet the enormous demand for healthcare services, China implemented various strategies to transform existing medical facilities. Temporary hospitals, such as the Fangcang shelter hospitals, were established to provide additional treatment capacity for COVID-19 patients. Simultaneously, measures were taken to isolate COVID-19 patients from non–COVID-19 patients, creating separate areas for screening, diagnosis, and treatment.

The outbreak of COVID-19 necessitated the reordering of healthcare priorities in China. Existing hospitals adjusted their operations, with many prioritizing the treatment of COVID-19 patients and only accepting emergency cases from non–COVID-19 patients. Non–urgent medical procedures and scheduled surgeries were postponed or canceled to prioritize the treatment of COVID-19 patients. Resources, including healthcare personnel and medical supplies, were reallocated to address the pandemic, thereby impacting the provision of routine healthcare services.

The COVID-19 pandemic prompted a rapid acceleration of digital transformation in China's healthcare system. Remote healthcare and online consultations gained prominence as alternative methods of healthcare delivery, providing patients with remote diagnosis, monitoring, and treatment. Digital platforms and technologies were also utilized for contact tracing, health monitoring, and data analysis to assist in managing the pandemic.

During the COVID-19 pandemic, the relentless demands and immense pressures on healthcare workers have affected their psychological and emotional well-being. Frontline healthcare workers faced higher risks of infection, prolonged working hours, and emotional stress, highlighting the need for comprehensive support and mental

health services.

By exploring the impact of COVID-19 on China's healthcare system, this section aims to comprehensively understand the challenges faced by healthcare providers and the strategies implemented to mitigate the effects of the pandemic.

4.2 Importance of Effective Hospital Management Strategies for Cabin hospital during Pandemics

During the COVID-19 pandemic, the role of cabin hospitals in providing essential medical services in China has become crucial. The Chinese government implemented a policy of admitting and treating as many COVID-19 patients as possible in cabin hospitals. As per the information provided by Xinhua News Agency on March 10th, 2020, a total of over 12,000 patients were admitted to 16 cabin hospitals in Wuhan, including the Leishenshan Cabin Hospital, during the period from February 5th to March 10th, 2020 (Xinhua News Agency, 2020). As the outbreak intensified and the number of patients surged, there was a high demand for emergency medical facilities, making effective management of cabin hospitals essential to ensuring efficient and high–quality healthcare services.

One crucial aspect of effective hospital management strategies is capacity planning and resource allocation. As temporary facilities, cabin hospitals require meticulous planning and organization to optimize resources and accommodate a large influx of patients. Insufficient planning can have a tremendous negative impact on healthcare professionals and isolated patients within cabin hospitals, leading to adverse social consequences and even undermining government credibility. The Shanghai World Expo Cabin Hospital has garnered significant negative publicity on the internet due to issues such as inadequate facility design, small spacing between beds, short bed lengths, insufficient bed capacity, poor sound insulation, slow provision of isolated patient meals, and subpar food quality, which have raised widespread societal concerns. This man–made disaster has fully exposed the critical need for effective patient flow management, sufficient personnel and resources, and

appropriate facility arrangements as essential requirements for emergency medical venues.

Furthermore, effective communication and coordination among various stakeholders are crucial for the successful operation of cabin hospitals. During a major pandemic, when resources are limited and demand is high, clear and timely communication is of utmost importance to ensure smooth coordination among healthcare professionals, administrators, government authorities, and other relevant parties. An incident occurred in the vicinity of Shijiazhuang city, where patients were initially notified to be collectively transported to a certain location but ended up being transferred to other cabin hospitals for isolation. This miscommunication between the cabin hospitals and the transportation agency resulted in the wastage of already scarce transportation resources, prolonged time for COVID-19 patients in enclosed buses, increased risk of cross–infection, and negative emotions among the personnel involved, ultimately affecting the epidemic prevention and control efforts. Only through clear communication channels, clearly defined roles and responsibilities, and efficient information sharing can the seamless operation of cabin hospitals be ensured. In the face of urgent challenges, effective information sharing among all parties is essential to providing timely nursing care and implementing intervention measures.

Another crucial aspect is infection control and prevention measures. Cabin hospitals must strictly adhere to infection control protocols to minimize the risk of disease transmission between patients and healthcare personnel. This includes implementing thorough screening processes, practicing appropriate hygiene habits, maintaining cleanliness, and disinfecting the environment, as well as ensuring the correct utilization of personal protective equipment (PPE). However, during pandemics, there is often a shortage of medical supplies, which poses a risk since patients and healthcare workers are isolated in situations where resources are limited. Therefore, in such circumstances, it becomes increasingly important to prioritize the implementation of physical measures to enhance infection control. Examples of practical measures include increasing the spacing between beds, ensuring proper ventilation of the facility, and promoting adherence to regulations for medical waste

disposal.

4.3 Evaluating the Potential of Cabin Hospitals for Pandemic Response

To evaluate the potential of cabin hospitals in responding to pandemics, this chapter will continue to use the representative examples of Leishenshan Fangcang Hospital, the Fangcang facility at the Shanghai New International Expo Center, and Fangcang Hospital near Shijiazhuang, as well as demonstrations to showcase the performance of cabin hospitals during different stages of the COVID-19 pandemic.

Cabin Hospital	Construction Period	Operational Period	Introduction	Location
Leishenshan Fangcang Hospital	January 25, 2020	February 8, 2020	Covering an area of 220,000 square meters, with a construction area of 79,900 square meters and 1,600 beds. Temporary medical facility built rapidly	Wuhan, Hubei, China
Fangcang facility at the Shanghai New International Expo Center	April 3, 2022	April 4, 2022 – June 14, 2022	Covering an area of about 600,000 square meters, with about 50,000 beds. Converted from a large exhibition center.	Shanghai, China
Fangcang Hospital near Shijiazhuang	November 10, 2022	December 25, 2023 around	Relatively large scale facility with a considerable 3,000 beds	Shijiazhuang, Hebei, China

4.3 Table 1: Overview of Mobile Cabin Hospitals

Hospital	Effectiveness	Advantages	Limitations
Leishenshan Fangcang Hospital	Rapid construction and deployment during the early phase	Quick response time and construction	Limited data accessibility for comprehensive evaluation
	Efficient utilization of medical resources	Effective utilization of resources	Potential challenges in addressing public concerns
	Played a crucial role in the initial stage of response	Contributed significantly to virus control in early phase	

Hospital	Effectiveness	Advantages	Limitations
Shanghai World Expo Fangcang Hospital	Successful coordination and collaboration during the construction phase	Utilized an existing facility for transformation	Negative public sentiments and protests
	Effective disease control measures	Provide a large number of beds	Insufficient living facilities and complaints regarding poor sound insulation in venue construction
	Operational effectiveness during reopening phase	Played a significant role in middle phase	
Shijiazhuang Fangcang Hospital	Significant efforts in disease control during late phase	Active participation in disease control	Public criticism
	Efficient allocation of resources	Efficient resource allocation	Insufficient transparency in information dissemination. Challenges in addressing public concerns
	Contributed to mitigating the pandemic in later phase	Crucial role in providing medical support in late phase	Lack of targeted healthcare services, resulting in generalized and basic medical care provision

4.3 Table 2: Evaluation of Mobile Cabin Hospitals

Chapter V – Results and Discussion

5.1 Overview of the Research Findings for the Selected Fangcang Hospitals

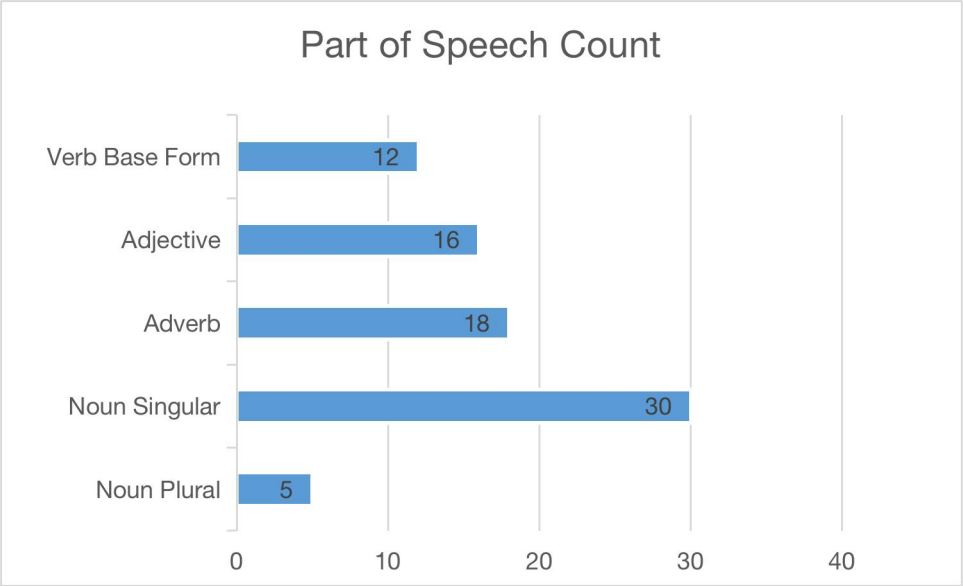
A qualitative research method was employed to analyze official information related to Leishenshan Cabin Hospital, relevant social news, and studies conducted by scholars.

(Liu et. al., 2020) included the following four groups of individuals who underInt COVID-19 IgM/IgG testing and SARS–CoV–2 RT–PCR testing between 29 February 2020 and 29 April 2020: 1,470 hospitalized COVID-19 patients from Leishenshan Hospital, Zhongnan Hospital of Wuhan University, and Wuhan Seventh Hospital,

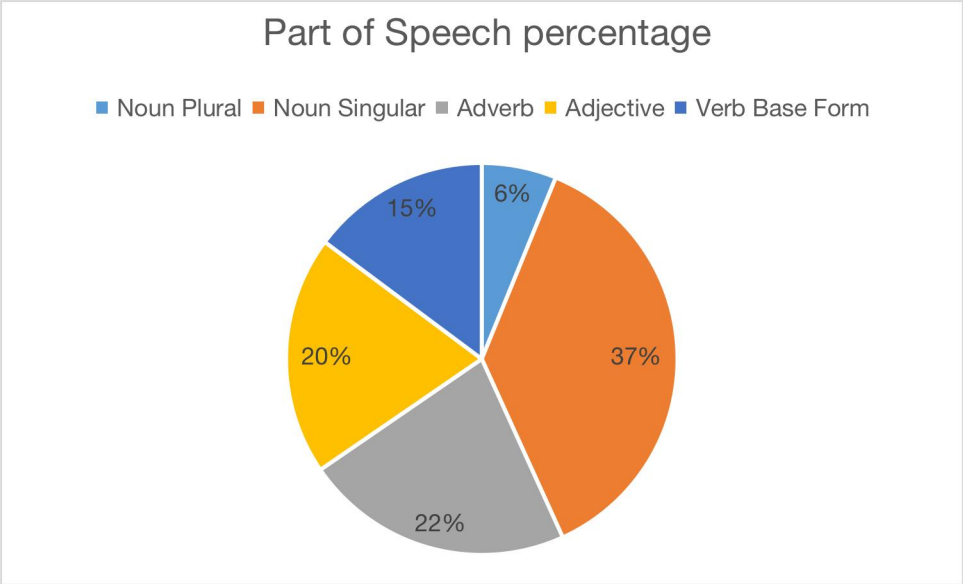
3,832 medical staff with undiagnosed COVID-19, 19,555 general workers, and 1,616 other admitted patients (N=26,473). (Cheng et. al., 2020) study the development of a psychological first aid model for hospitalized patients with COVID-19 in Wuhan, China. Develop a model of mental health interventions applicable to hospitalized patients during a pandemic such as COVID-19, or with under–resourced mental health care. (Luo et. al., 2020) documented the design and construction of hospitals. (Jin et. al., 2020) collected 147 clinically diagnosed COVID-19 patients from Leishenshan Hospital in Wuhan, Hubei Province, China. (Chen et al., 2021) aims to take the construction of Leishenshan Hospital as an example to explain how to use BIM technology and high–tech technologies such as big data, artificial intelligence, drones, and 5G to quickly build Leishenshan Hospital. Prefabricated steel structure system in emergency engineering projects. The number of cases has increased rapidly, but the auscultatory characteristics of affected patients and how this can be used to predict who is most likely to survive or die is unclear. (Zhang et. al., 2021) aimed to describe the auscultatory features of SARS–CoV–2 pneumonia and their clinical correlates by using a wwereless stethoscope. (Long et. al., 2021) investigated the role of FIB levels in COVID-19 prognosis. Other influential works include (Cai et. al., 2020), (Cheng et. al., 2020), (Chen et. al., 2021).

In summary, the literature review demonstrates the significant achievements and remarkable performance of Leishenshan Hospital as a renowned Fangcang hospital in the prevention, treatment, and management of COVID-19. The successful operation of Leishenshan Hospital provides valuable examples and experiences for the subsequent operation of other Fangcang hospitals, patient care strategies, technological advancements, and psychological health interventions. This knowledge also contributes to strengthening future pandemic response strategies and the overall understanding of hospital management during public health crises.

As for the Shanghai New International Expo Center Fangcang hospital, using the SPSS software, a word frequency analysis was conducted on the firsthand account data, yielding the following results:



5.1 Figure 1 Part of Speech Count



5.1 Figure 2 Part of Speech percentage

Word	Part of speech	Frequency	Analysis
day	Noun(singular)	50	The term "day" appears 50 times in the text, indicating that descriptions related to days and time are common. This phenomenon may have two reasons. Firstly, the author may have adopted a chronological narrative style, providing detailed descriptions of each day during the quarantine period in the Shanghai Expo Fangcang hospital. Secondly, within the Shanghai Expo Fangcang hospital, people are generally concerned about the duration of the isolation and when they can be released, thus placing an emphasis on time – related information.
cabin	Noun(singular)	37	The term "cabin" appears 37 times, referring to the isolation facility

			where the author was admitted. As it is the primary institution mentioned in the text, it appears most frequently.
shelter	Noun(singular)	34	The term “shelter” appears 34 times and is similar in meaning to “cabin,” as it also refers to the Shanghai Expo Fangcang hospital.
water	Noun(singular)	29	The term “water” appears 29 times, indicating that descriptions, supplies, or usage related to water are frequently mentioned in the text. This could be associated with drinking water, washing, or water resources. The specific analysis suggests that the inconvenience of bathing, the use of flush devices in mobile toilets, and the scenes of people washing up in the morning are factors contributing to the high frequency of water – related descriptions. The supply and stability of water resources are crucial for those in isolation within the Fangcang hospital.
home	Noun(singular)	28	The term “home” appears 28 times in the text. This indicates that descriptions related to “home,” including locations or a sense of belonging, are frequently mentioned. These descriptions likely reflect the yearning and concern of the individuals in the Shanghai Expo Fangcang hospital for their own homes, residences, or places of belonging. During the isolation period, people often miss their families and familiar environments, thus resulting in a higher frequency of mentions of "home" in the descriptions.
night	Noun(singular)	28	The term “night” appears 28 times, indicating that descriptions, references to time, or experiences associated with the night are frequently mentioned. This may be related to nighttime activities, darkness, or events that occur during the night. The firsthand account mentions poor sleep, high nocturnal noise levels, and lights being on throughout the night, which are factors contributing to the frequency of night – related descriptions.
hospital	Noun(singular)	28	It appears 28 times. It indicates that descriptions related to hospitals are common in the text data. This is relevant to the theme of the text, which is about Fangcang hospitals. The firsthand accounts in the literature provide detailed information about the living conditions of patients, medical facilities, and medical resources in Fangcang hospitals.
one	Noun(singular)	27	The term “one” appears 27 times, indicating that descriptions, quantities, or choices associated with “one” are mentioned frequently. It may refer to an individual, a specific item, or a certain type of thing. In the text, the most frequent occurrence of “one” is in a paragraph describing the supplies received upon entering the Fangcang hospital, such as disinfectant wipes, hand sanitizer, a plastic basin, toothpaste and toothbrush sets, disposable paper cups, masks, and plastic slippers.
acid	Noun(singular)	23	The term “acid” appears 23 times in the text. Specifically, it refers to “nucleic acid,” which is the colloquial term used by the Chinese

			people to refer to the PCR (Polymerase Chain Reaction) test. In the context of the Fangcang hospital isolation, it is required for individuals to test negative for nucleic acid and maintain a certain number of days before being allowed to leave the facility. Therefore, isolation patients are highly concerned about whether their PCR results are positive or negative.
nurse	Noun(singular)	23	The term "nurse" appears 23 times, referring to the nursing staff in the Fangcang facility. Only patients with underlying conditions such as hypertension or diabetes require medical care from doctors. In most cases within the Fangcang facility, individuals come into contact with nurses who are responsible for distributing supplies, maintaining order, providing psychological support, and performing various tasks.
Shanghai	Noun(singular)	20	The term "Shanghai" appears 20 times. The text describes experiences that took place in the Shanghai Expo Fangcang hospital, hence the frequent occurrence of this term.

5.1 Table 1: List of Most Frequently Occurring Singular Nouns.

The five words with the most occurrences of plural nouns are:

Word	Part of Speech	Frequency	Analysis
people	Noun Plural	83	The plural form "people" appears 83 times, indicating the frequent discussion, portrayal, or mention of multiple individuals. Within the context of our data, which focuses on the experiences within the Fangcang hospitals, numerous individuals coexist in these facilities. The usage of "people" represents both collective depictions and individual accounts, documenting the behaviors, emotions, and interactions of the individuals within the Fangcang hospitals.
days	Noun Plural	28	The singular form "day" appears 50 times, while the plural form "days" appears 28 times. This signifies that in our text data, there are detailed portrayals of specific individual days, along with mentions of multiple days or time periods. The singular form may relate to particular dates, specific events, or the depiction of a single day, while the plural form may pertain to the duration of the isolation period or the passage of time.
nurses	Noun Plural	12	The singular form "nurse" appears 23 times, while the plural form "nurses" appears 12 times. This suggests that in our text data, there are descriptions of individual nurses as well as references to collective or multiple nurses. The singular form emphasizes specific nurse behaviors, roles, or individual characteristics, while the plural form highlights the collaborative efforts and quantity of nurses.
hours	Noun Plural	10	The plural form "hours" appears 10 times, underscoring the prevalence of descriptions related to multiple hours. This may include discussions about time arrangements, activity schedules, or the duration of specific events within the

			Fangcang hospitals.
meals	Noun Plural	10	The plural form "meals" appears 10 times, emphasizing the frequent mentions of meal – related descriptions, provisions, or consumption. In our text data, the proper provision of meals is crucial within the Fangcang hospitals. It is worth noting that incidents of meal grabbing were mentioned, not due to resource scarcity but rather arising from people's panic and fear of inadequate medical supplies. These incidents were a result of collective panic and herd mentality. As the management of the Fangcang hospitals improved, such incidents diminished. The text also refers to the author taking a portion of the meals when leaving the Fangcang hospitals due to others around them doing the same, further demonstrating the influence of herd mentality. Within the enclosed environment of the Fangcang hospitals, eating and sleeping became the most fundamental and essential concerns for individuals.

5.1 Table 2: List of Most Frequently Occurring Plural Nouns.

Among the discussed nouns, in the text data I analyzed, both "nurse" and "day" were found to appear in both singular and plural forms, indicating their high frequency regardless of the form used.

The most frequent adjectives are as follows:

Word	Part of Speech	Frequency	Analysis
nucleic	Adjective	23	It appears 23 times. This adjective is consistently combined with "acid" and is used to describe the specific concept of "nucleic acid". In the text, it is mainly used to describe information related to nucleic acid testing (PCR test), such as the testing time, number of tests conducted, and test results (negative or positive).
good	Adjective	21	It appears 21 times. When used as an adjective, it signifies something that is good or positive. It may involve positive descriptions in relation to Fangcang hospitals, such as good medical services, good activity spaces, and a sufficient food supply. However, it is also associated with the optimistic and positive mindset and language choices of the firsthand accounts.
many	Adjective	18	It appears 18 times. When used as an adjective, it means a large number or a significant amount. It may be used to describe the number of people or the quantity of items in Fangcang hospitals. For example, there are many people or many supplies in Fangcang hospitals.
other	Adjective	18	It appears 18 times. When used as an adjective, it signifies something that is different or distinct from others. It may be used to compare or differentiate different things, groups, or situations in Fangcang hospitals. For example, the author describes their specific situation in comparison to other patients.
few	Adjective	18	It appears 18 times. When used as an adjective, it indicates a small

			number or a few. It is the opposite of "many". In the descriptions of Fangcang hospitals, the firsthand accounts do mention that things that are beyond the norm are usually few. For example, there are few people who don't want to go home or few people who can rest well, as mentioned in specific statements.
next	Adjective	16	It appears 16 times. When used as an adjective, it means next or following. In the text, it may be used to describe what will happen next or the next steps in the process. It is the author's preferred wording habit.
long	Adjective	15	It appears 15 times. When used as an adjective, it signifies a long duration or a prolonged period of time. It may be related to the sense of time experienced during the isolation period in Fangcang hospitals. Due to the density of people, it naturally takes longer to receive supplies in public areas.
little	Adjective	13	It appears 13 times. When used as an adjective, it means a small amount or very few. In the text, it is used to describe the author's emotional states, such as feeling a little twered, a little greedy, a little confused, a little anxious, and a little worried, indicating the author's generally optimistic and emotionally stable mindset.
mobile	Adjective	13	It appears 13 times. When used as an adjective, it means movable or capable of being moved. It primarily appears in two instances: first, the location where the firsthand accounts were before entering the Fangcang hospital had no available wireless network signal (mobile signal); second, the toilets in the Expo Fangcang were mobile container – type toilets, which explains the higher frequency of the word "mobile."

5.1 Table 3: List of Most Frequently Occurring Plural Nouns.

Below are the most frequent adverbs.

Word	Part of Speech	Frequency	Analysis
also	Adverb	63	Appearing 63 times. "also" is a common adverb used to indicate additional information or supplementary facts. The firsthand accounts gradually became familiar with the life in the Fangcang hospitals, and the behavior of the crowd gathering became assimilated. In the text, "also" is used to introduce related statements or provide extra information, such as "there is also noise."
not	Adverb	59	Appearing 59 times. "not" is a negation adverb used to deny statements or express the opposite meaning. In the text, it is used to indicate the negation of certain actions, such as "Nurses are not allowed to leave the ward to fetch water from the boiling water room". It is also used to negate states or conditions, such as "A thermos is obviously not enough for six big men".
very	Adverb	28	Appearing 28 times. "very" is an intensifying adverb used to enhance the degree of adjectives or adverbs. In the text, it is used to describe certain conditions inside the Fangcang hospitals or to convey the author's intense

			emotional tendencies. For example, “But the communication was very difficult” or “The sound of the mobile phone is very loud.”
here	Adverb	28	Appearing 28 times. “here” is a demonstrative adverb used to indicate position or location. In the text, it may be used to specify a particular place or remind the readers or listeners of the existence of a certain location.
only	Adverb	27	Appearing 27 times. “only” is a limiting adverb. In the text, it may be used to emphasize the uniqueness or particularity of something. For example, the author mentions the narrow beds in the Fangcang hospitals, “The escort stool is only 50cm wide,” or the opacity of information inside the cabin, “But only doctors and nurses know the nucleic acid test results and when patients can be discharged.”
still	Adverb	26	Appearing 26 times. “still” is an adverb with multiple meanings. In the text, it can indicate “still,” “yet,” or “motionless”. “People inside and outside the cabin are still suffering until now, how can I keep talking about it with the cheek?”
north	Adverb	20	Appearing 20 times. "north" is a directional adverb used to indicate direction or position. In the text, it is used to specify a certain location or indicate the northward direction. It is mentioned in the context of the north square, the north corridor, and when describing orientations towards the north.

5.1 Table 4: List of Most Frequently Occurring Adverbs.

The following is an analysis of the most frequent verbs:

Word	Part of Speech	Frequency	Analysis
don’t	Verb Base Form	27	It appears 27 times. “Don’t” is the contraction of “do not” and is a negation verb. The frequent use of “don’t” reflects the regulations, prohibited behaviors, and precautionary measures that need to be followed within the Fangcang hospitals. It indicates the strict management and control measures implemented during the COVID-19 pandemic to ensure the safety of patients and staff. For example, when leaving the ward, a nurse tells the firsthand observer, “Pack your luggage, and you don’t need to wear white protective clothing anymore”. The high occurrence of “don’t” also stems from the author’s reflections on different lifestyles within the Fangcang hospitals. For instance, when describing people’s sleep habits, the author writes, “Some people don’t get up until 5 o’clock. Some people don’t go to bed until 2 or 3 o’clock.”
take	Verb Base Form	18	It appears 18 times. The frequent use of “take” indicates the activities individuals can engage in and the resources they can access within the Fangcang hospitals. For example, “There is a bathroom in the ward, you can take a shower, and the hot water comes out quickly”. It also includes descriptions of the activities of the firsthand observer and other isolated individuals within the Fangcang hospitals.
know	Verb Base Form	16	It appears 16 times. The repetition of “know” signifies the emphasis placed on knowledge, understanding, and awareness among individuals within the Fangcang hospitals. It highlights their familiarity with protocols, procedures,

			and the evolving situation.
get	Verb Base Form	15	It appears 15 times. The frequent use of "get" indicates the active pursuit or achievement of various objectives within the Fangcang hospitals. It signifies the efforts made to obtain necessary resources, achieve deswered outcomes, and adapt to the changing environment. When describing the food supply within the Fangcang hospitals, the author depicts a bit of chaos, stating, "If others have it, they will worry that they will not get it."
feel	Verb Base Form	13	It appears 13 times. The repeated use of "feel" emphasizes the importance placed on individuals' emotions and physical experiences within the Fangcang hospitals. It highlights their awareness and expression of various emotions, sensations, and psychological states.
turn	Verb Base Form	13	It appears 13 times. The verb "turn" is used to describe the rotational actions of objects or individuals within the Fangcang hospitals. It conveys the movement, change of direction, or transformation of certain entities. For example, "After dinner every day, the shelter turns into a noisy small town with people coming and going".
sleep	Verb Base Form	12	It appears 12 times. The repeated use of "sleep" underscores the significance of rest, relaxation, and sleep patterns within the Fangcang hospitals. It emphasizes the attention given to ensuring sufficient rest and addressing sleep – related issues in the healthcare setting.

5.1 Table 5: List of Most Frequently Occurring Base Form Verbs.

In summary, the frequency analysis conducted on the data from the firsthand experiences of Shanghai Cabin Hospital patients provides valuable insights into their living conditions and emotional tendencies within the facility. It reveals aspects of the cabin hospital's operations, patient experiences, and effectiveness in managing COVID-19 cases.

A survey was conducted using questionnaires at the Zhengding Convention Center, which is a cabin hospital located in the vicinity of Shijiazhuang. A total of 171 questionnaires were collected, and the survey results are as follows:

There were 171 valid responses for gender, with 81 responses from males and 90 responses from females, accounting for 47.37% and 52.63% respectively. There were no responses from individuals of other genders in this survey.

The age group with the highest number of participants in this survey was 18 – 24 years old, accounting for 37.43% of the total. The second–highest age group was 25 – 34 years old, accounting for 15.79%. The age group of 55 years and older had the fewest participants, comprising only 4.09%. Overall, the survey saw greater

participation from younger individuals. This may be attributed to the fact that the target population for distributing the questionnaire primarily consisted of university students and their relatives and friends.

When asked about their satisfaction with the medical services received, a relatively high proportion of respondents expressed satisfaction or high satisfaction with the medical services at the cabin hospital, accounting for 58.48% of the total valid responses. However, a considerable proportion of respondents expressed moderate or low satisfaction, accounting for 31.99% of the total valid responses. This indicates that there is a certain level of satisfaction with the medical services provided by the cabin hospital overall, but there is still room for improvement. It is worth noting that a portion of respondents expressed extreme dissatisfaction, accounting for 10.53% of the total valid responses, highlighting an area that requires focused attention and improvement.

Among the sample population surveyed, the majority of individuals were admitted between December 1, 2022, and December 30, 2022, with proportions of 43.86% for December 1 to December 15 and 45.03% for December 16 to December 30. Additionally, 11.11% of the respondents were admitted on dates other than the ones mentioned above.

In this survey, more than half of the respondents (68.65%) stayed in the cabin hospital for 5 days or more, with the highest proportion (37.43%) staying for 5–8 days. The next highest number of individuals (30.41%) stayed for 9–12 days. The fewest number of people (9.36%) stayed for 1–4 days. Additionally, 22.81% of the respondents stayed in the cabin hospital for 13 days or more.

When asked about the medical expertise level of the cabin hospital, the proportions of respondents who selected “very high,” “high,” “average,” “low,” and “very low” were 23.98%, 25.15%, 23.39%, 16.96%, and 10.53% respectively. It can be observed that the proportions for the options of “high,” “average,” and “low” are relatively similar, at 25.15%, 23.39%, and 16.96% respectively. The proportions for “very high” and “very low” are lower, at 23.98% and 10.53% respectively. Therefore, overall, most people hold a neutral stance regarding the medical expertise level of the

cabin hospital.

Regarding the nursing services provided by the cabin hospital, a relatively high proportion of respondents expressed moderate satisfaction or dissatisfaction, accounting for 49.13% of the total valid responses. The proportions for “very satisfied” and “satisfied” were 19.3% and 21.64% respectively, which are relatively lower. Additionally, a certain proportion of respondents expressed extreme dissatisfaction, accounting for 9.94% of the total valid responses.

Regarding the bed arrangements in the cabin hospital, more than half of the respondents (46.20%) believed that the arrangements were unreasonable or very unreasonable, while less than half of the respondents (46.20%) considered them reasonable or very reasonable. Therefore, it can be concluded that there are certain issues with the bed arrangements in the cabin hospital that need further improvement.

Regarding the hygiene conditions of the cabin hospital, a relatively high proportion of respondents expressed moderate satisfaction or dissatisfaction, accounting for 41.52% of the total valid responses. The proportions for “very satisfied” and “satisfied” were 29.24% and 18.71% respectively, which are relatively lower. Additionally, a certain proportion of respondents expressed extreme dissatisfaction, accounting for 10.53% of the total valid responses. These data indicate that there is room for improvement in the overall hygiene conditions of the cabin hospital.

In the evaluation of the quality of life in the cabin hospital, the proportions for “very satisfied,” “satisfied,” “average,” “dissatisfied,” and “very dissatisfied” were 23.98%, 20.47%, 22.81%, 22.81%, and 9.94% respectively. It can be observed that the majority of people hold a positive or neutral attitude towards the quality of life in the cabin hospital, but there is also a portion of individuals who are dissatisfied or very dissatisfied. Further investigation is needed to determine the reasons.

During the treatment process in the cabin hospital, 27.49% of the respondents felt it was very effective, 21.05% felt it was effective, 15.2% felt it was average, 26.32% felt it was ineffective, and 9.94% felt it was very ineffective. Overall, 48.54% of the respondents felt it was effective or very effective, while 36.26% felt it was ineffective or very ineffective.

According to the data, 30.41% of the respondents believed that the cabin hospital provided very sufficient psychological support, 22.22% believed it was sufficient, 12.87% believed it was average, 24.56% believed it was insufficient, and 9.94% believed it was very insufficient. Overall, more than half of the people considered the psychological support provided by the cabin hospital to be sufficient or very sufficient, but there are still a significant number of individuals who perceive it as insufficient or very insufficient, indicating a need for further strengthening of psychological support efforts.

According to the statistical results, it can be seen that the majority of people (91.23%) perceive the severity of their symptoms to be between 3 and 0. Only a small number of individuals (8.77%) consider their symptoms to be relatively severe, with 6 individuals (3.51%) rating the severity between 10 and 7, and 9 individuals (5.26%) rating it between 6 and 4.

Based on the data table, most people hold a negative attitude towards receiving home isolation treatment in the cabin hospital. Among them, 36.84% of the respondents strongly prefer not to receive treatment in the cabin hospital, and 34.5% of them do not prefer it. Only a few individuals are inclined or strongly inclined to receive treatment in the cabin hospital, accounting for 5.26% and 5.26% respectively. Additionally, 18.13% of the respondents chose the neutral option.

Based on the above survey results, the following conclusions can be drawn:

The age group is mainly concentrated in the 18–24 and 25–34 age ranges, indicating a higher level of participation among young people. This result is likely related to the distribution of the survey among university students and their relatives and friends.

The overall satisfaction with the medical services provided by the cabin hospital tends to be average, with most people holding a neutral attitude towards the received medical services. It should be noted that the cabin hospital adopts a combination of traditional Chinese and western medicine, and a significant amount of Chinese herbal medicine is distributed. However, COVID-19 is different from common wellness and cannot be eradicated by medication. The treatment mainly focuses on symptom

management and relies on the patient's immune response. Therefore, it is reasonable to have relatively moderate feedback on satisfaction with medical services based on the sample data.

There are issues with the bed arrangement in the cabin hospital, as more than half of the respondents perceive it as unreasonable or very unreasonable. Similarly, the cleanliness conditions and nursing services in the cabin hospital need improvement. The overall quality of life in the cabin hospital, which lacks supporting sample data, is also negatively perceived. This is mainly due to the transformation of the Shijiazhuang venue into a cabin hospital on a relatively large scale, with a high density of beds, and the forced coexistence and living with strangers without freedom of movement, which can understandably lead to dissatisfaction among the majority of people. Further improvements are necessary in these areas.

Additional efforts are required to enhance psychological support in the cabin hospital, as a certain proportion of respondents feel that it is insufficient.

It is worth noting that the establishment and operation of the cabin hospital in Shijiazhuang occurred during the middle and late stages of the epidemic, when the spread of the novel coronavirus in China had entered a phase of rapid transmission with fewer severe cases. Therefore, the majority of people perceived their symptoms to be between 0 and 3 on the severity scale, with only a small number considering their symptoms to be relatively severe.

Compared to home isolation, most people do not prefer to receive treatment in a cabin hospital. This result is evident because the cabin hospital cannot provide specific medical treatment for COVID-19. During the period of admission to the cabin hospital, individuals' quality of life, living standards, social needs, and personal development in terms of work and education cannot be fully met. Additionally, since most infected individuals experience only mild symptoms, the majority of people do not want to be placed in the cabin hospital for isolation. This leads us to reflect on the optimal timing to implement cabin hospitals, considering the stage of the epidemic, the social context, and the development of the infectious disease.

This is the specific research result of the three selected shelter hospitals, using

different research methods, hoping to show the performance of the shelter hospitals in different stages of the epidemic in China as comprehensively as possible.

5.2 SWOT i Analysis of the Fangcang Hospitals: Strengths, Weaknesses, Opportunities, and Threats

From a sustainability perspective, the SWOT i analysis of Fangcang hospitals is as follows:

Strengths:

Flexibility and Adaptability: Fangcang hospitals have the capability of rapid deployment and construction. During the COVID-19 pandemic in China, Fangcang hospitals were quickly established by the central or local governments, allowing for a swift response to the outbreak or disasters. These temporary medical facilities could be rapidly provided in the early stages of an infectious disease outbreak to meet urgent needs. Moreover, Fangcang hospitals demonstrate high adaptability, enabling them to adjust the venue layout, bed capacity, and other aspects based on the number of infections and other requirements. This showcases their ability to respond promptly to public health emergencies and their resilience when facing unforeseen challenges.

Efficient Resource Utilization: Fangcang hospitals often adopt modular design, enabling effective utilization of limited resources. They also facilitate the centralized allocation of social resources, maximizing their efficiency in the face of scarcity. This includes human resources, medical supplies, and energy, all of which, when properly coordinated, contribute to reduced waste and increased efficiency.

Environmentally Friendly: Some Fangcang hospitals take environmental-friendly factors into consideration in their design and operation. They may use renewable energy sources, energy-efficient equipment, and recyclable materials, aiming to minimize their negative impact on the environment. Additionally, certain venues converted into Fangcang hospitals can return to their original social functions, such as large convention centers or sports arenas, after the epidemic, thereby continuing to serve as important community assets. Medical equipment used in Fangcang hospitals

can also be redirected to local medical institutions, like nursing homes or care facilities, or sold, effectively reducing social resource waste.

Public Confidence: The establishment and successful operation of Fangcang hospitals reflect the commitment of the healthcare system to safeguarding public health. This enhances public confidence in medical infrastructure during infectious disease outbreaks, fostering trust in the healthcare system. Maintaining stable public psychological states is crucial for sustaining social stability and controlling disease transmission.

weaknesses:

Long-term Sustainability: Despite the significant effectiveness of Fangcang hospitals in the initial response to public health crises, their long-term sustainability may be a concern. Factors such as maintenance costs, challenges in staffing, and ongoing financial requirements need to be addressed to ensure their continued effectiveness. The question of whether using a substantial amount of social resources for disease control is sustainable arises when controlling the spread of infectious diseases becomes a long-term issue.

Limited Specialized Care: Fangcang hospitals may have limitations in providing specialized medical care or handling complex cases. Their primary focus is on isolation and basic medical services. Due to a high patient load and a relatively low number of medical personnel, it can be challenging to provide tailored medical services to each patient. Additionally, due to the nature of Fangcang hospitals as facilities designed for controlling the spread of infectious diseases, there are restrictions on patient movement, considering the risk of disease transmission. This may result in delayed treatment for some acutely rare diseases and the need to transfer patients with special needs to specialized medical facilities.

Infrastructure Constraints: The temporary nature of Fangcang hospitals means that they may lack certain infrastructure and comfort facilities found in traditional medical settings. Examples include partition devices for privacy protection, noise control equipment, stable water source control, and clean and independent toilets. These limitations can affect patient comfort and the overall quality of care provided.

Stakeholder Engagement: Effective engagement and cooperation among stakeholders are crucial for the sustainability of Fangcang hospitals. The involvement and support of government agencies, healthcare professionals, and the community are essential for long-term success. If the control period extends for an extended period, challenges such as insufficient government funding, shortages or fatigue among healthcare professionals, and decreased community participation can arise.

Opportunities:

Knowledge and experience sharing: The establishment of cabin hospitals provides an opportunity for knowledge and experience sharing. Previous experiences in establishing cabin hospitals during the 2003 SARS-CoV outbreak in China can be examined and validated. The lessons learned from the current COVID-19 pandemic and the experiences gained can contribute to improving emergency response capabilities and the future development of healthcare infrastructure. Additionally, cabin hospitals usually comprise multidisciplinary medical teams, including doctors, nurses, virologists, epidemiologists, etc. This interdisciplinary collaboration and knowledge sharing can facilitate the development and implementation of new medical approaches, offering opportunities for improving and optimizing treatment methods.

Facility transformation: The experience gained from converting large-scale facilities into medical centers can inspire innovative solutions. Incorporating sustainability and multifunctionality into future construction needs can provide efficient and flexible healthcare spaces for future public health crises.

Experimentation with new medical approaches: cabin hospitals can serve as testing grounds for innovative medical methods. During the pandemic, new treatment methods and drugs may emerge, requiring experimentation and validation of their effectiveness. Cabin hospitals can provide a relatively closed environment for testing and monitoring new medical approaches, evaluating their efficacy, safety, and feasibility. This creates opportunities for advancing medical research and innovation and may lead to breakthroughs in clinical practice post-pandemic.

Strengthened healthcare system: Successful establishment of cabin hospitals can prompt investments in the overall healthcare system, including improving healthcare

infrastructure and enhancing coordination capabilities at various levels. This supports the development of robust emergency response plans.

Collaboration and partnerships: The establishment of cabin hospitals opens up new opportunities for cooperation and partnerships among various stakeholders, fostering interdisciplinary approaches to public health challenges and strengthening the healthcare ecosystem.

Threats:

Resource limitations: cabin hospitals may face limitations in human resources, supplies, and finances. During a large-scale outbreak, the demand may rapidly exceed the available supply capacity, affecting the operation of medical facilities. Additionally, if cabin hospitals operate unnecessarily for extended periods, they may excessively consume societal resources and create pressure on society.

Policy and regulatory challenges: As emergency healthcare facilities, cabin hospitals still need to adhere to various standards. In China, relevant standards and institutional frameworks may still be incomplete. Establishing and operating cabin hospitals requires a supporting medical system, improvements in medical standards, and coordination with existing healthcare institutions to classify and redirect medical tasks.

Risk management and emergency planning: Continuous evaluation and improvement of risk management strategies and emergency plans are necessary to address potential threats such as resource shortages, unforeseen events, or disease outbreaks.

Technological and equipment limitations: cabin hospitals may face limitations in terms of technology and equipment. Due to their temporary nature, specific medical equipment may not be available, limiting the diagnostic and treatment capabilities of cabin hospitals to a lower level.

Infectious disease control risks: While cabin hospitals are measures for infectious disease control, there is still a risk of disease spread due to the dangerous nature of infectious diseases and various complex factors. This necessitates clear measures and restrictions for infection control during the diagnostic and treatment processes.

Staff fatigue and psychological pressure: During a major infectious disease outbreak, insufficient staffing and an uneven distribution of human resources across society can lead to healthcare workers experiencing prolonged work pressure and psychological stress. Sustained workloads and high-risk environments can result in fatigue, reduced work efficiency, and potential impacts on medical quality and safety.

Communication and coordination difficulties: Establishing and operating cabin hospitals require close coordination and communication among various stakeholders. Inadequate communication and coordination mechanisms may lead to delayed information transmission, decision-making challenges, and cooperation issues, thereby affecting the smooth operation of healthcare services.

Social acceptance and opposition: The establishment and operation of cabin hospitals may be influenced by social acceptance and opposition. Over time, negative public opinion, often amplified by media coverage, may lead to skepticism about the effectiveness and safety of temporary healthcare facilities. This can generate social discourse and negative feedback, posing a threat to the reputation and acceptance of cabin hospitals.

5.3 Contributions of the Study to Existing Theory on Pandemic Response

This study aims to investigate the role of Fangcang hospitals during different stages of the pandemic, including the early, middle, and late phases. The goal is to assess whether Fangcang hospitals consistently provide the optimal solution throughout these stages and contribute to the existing theory and practice of pandemic response. The main contributions of this study in this field are as follows:

Through a qualitative analysis focusing on the operation of the Leishenshan Hospital during the early phase of the pandemic, this study gained an in-depth understanding of the role of Fangcang hospitals and their impact in China during the initial outbreak. The evaluation revealed the significant role played by Fangcang hospitals in establishing temporary medical facilities, providing isolation and treatment services, and effectively alleviating the burden on the healthcare system.

Furthermore, Fangcang hospitals offered timely treatment opportunities for a large number of patients, contributing to stabilizing public sentiment and enhancing government credibility. This finding provides important theoretical and practical support for epidemiological investigations, infectious disease control, and medical resource allocation during the early stages.

The Shanghai Expo Fangcang Hospital was selected as a specific case for studying the effectiveness of Fangcang hospitals during the middle phase of the pandemic. Through frequency analysis of firsthand accounts, this study explored the lives and psychological conditions of patients admitted to the Fangcang hospital. As the pandemic evolved and containment strategies were adjusted, Fangcang hospitals faced challenges in terms of staffing, resources, and management. Poor coordination and communication among different stakeholders also had an impact on their effectiveness. These findings provide practical guidance and improvement recommendations for the management and resource allocation of Fangcang hospitals during the middle stage.

A questionnaire survey was conducted at the Zhengding International Convention and Exhibition Center, a Fangcang hospital that operated during the late phase of the pandemic. In this aspect of the study, the inclination of admitted patients towards Fangcang hospitals was investigated. The research evaluated the sustainability of Fangcang hospitals during the late stage and provided an assessment of their applicability and feasibility. The findings revealed that, as the pandemic was brought under control and the number of patients decreased, Fangcang hospitals faced challenges related to social acceptance, resource constraints, and sustainable operations. This finding offers important insights for management, future planning, and decision-making regarding Fangcang hospitals during the late stage.

In summary, this study comprehensively evaluates the role of Fangcang hospitals during the early, middle, and late stages of the pandemic, making significant contributions to the existing theory and practice of pandemic response. The findings contribute to optimizing the application strategies of Fangcang hospitals, improving their effectiveness and sustainability across different stages, and better preparing for

future public health emergencies.

5.4 Practical Implications and Recommendations for Fangcang Hospital Management

This study has significant practical implications for the management of Fangcang hospitals. By examining the role of Fangcang hospitals in different stages of major infectious diseases and evaluating their performance, valuable insights are provided for the future establishment and operation of Fangcang hospitals during large-scale outbreaks.

Firstly, this study is important in revealing the role of Fangcang hospitals in different stages of epidemics. Through the study of representative Fangcang hospitals, a deeper understanding of their effectiveness during the early, middle, and late stages of an epidemic can be gained. This is crucial for identifying the advantages of Fangcang hospitals and their ability to address challenges at different stages. For example, during the initial phase of an outbreak, Fangcang hospitals can quickly establish temporary medical facilities, provide isolation and treatment services, and effectively alleviate the burden on the healthcare system. However, in the middle and late stages, Fangcang hospitals may face challenges related to manpower, resources, and management. Therefore, targeted recommendations can be made to improve the operational efficiency and quality of Fangcang hospitals.

Secondly, this study retains a wealth of primary data, which is characterized by its timeliness and information value. Considering the uniqueness of epidemic-specific information, this study has collected and analyzed Chinese-language materials, providing valuable literature on the COVID-19 outbreak in China for the academic community. This is particularly helpful for future researchers who wish to study and understand the background and experiences of the Chinese epidemic. Additionally, the research findings and data can be referenced and validated by other scholars, providing important references for further research in the field of epidemic response.

Furthermore, this study emphasizes the importance of addressing the

psychological and emotional well-being of isolated patients in Fangcang hospitals. As the epidemic unfolds, patients in Fangcang hospitals face psychological pressures and emotional challenges. By analyzing and assessing the psychological conditions of patients, their needs and challenges can be understood, enabling Fangcang hospital managers to provide targeted interventions and support to improve the mental health of patients and overall epidemic control effectiveness.

Based on the results of this study, several recommendations can be made for future Fangcang hospitals:

Based on Strengths:

Strengthen the facilities and resources of Fangcang hospitals by establishing dedicated multifunctional facilities that can be utilized for other purposes in non-outbreak situations and easily converted into Fangcang hospital facilities during large-scale outbreaks to better facilitate emergency responses and meet potential demands in future major infectious disease outbreaks.

Promote technological innovations such as telemedicine and intelligent management systems to achieve information sharing and reduce communication barriers, thereby improving the operational efficiency and service quality of Fangcang hospitals.

Based on Weaknesses:

Enhance the management of human resources in Fangcang hospitals, including training and management of medical personnel, to improve work efficiency and reduce staff turnover. Additionally, prioritize emergency medical training for existing healthcare workers, strengthen process training and awareness of prevention and control, and also enhance attention to the mental health of medical staff.

Promote and standardized operational processes with clear responsibilities at all levels. By establishing established protocols and rules, potential management issues and coordination difficulties can be reduced.

Based on Opportunities:

Recommend close collaboration with the government and other medical institutions to share resources and experiences. Analyze first-hand information

accumulated by Fangcang hospitals during this epidemic to provide more insights for future similar situations and enhance the overall effectiveness of Fangcang hospitals.

Promote international cooperation and exchange among Fangcang hospitals. Research the innovative strategies adopted by Chinese Fangcang Hospitals, and facilitate medical management exchange and collaboration with foreign Fangcang hospitals to improve management practices and technological applications.

Based on Threats:

Establish a flexible supply chain and reserve system, implement early warning mechanisms, and enhance backup plans for long-term infectious disease prevention and control to address potential material shortages and supply chain disruptions.

Enhance the crisis management capabilities of Fangcang hospitals by developing emergency plans and conducting drills to respond to unforeseen situations and security threats.

Strengthen public communication and education on infectious diseases, while striving for information transparency and respecting the public's right to information, to build government credibility.

Chapter VI – Conclusions and Recommendations

6.1 Summary of the Research Findings

In this study, I have identified several key findings regarding the role and effectiveness of Fangcang hospitals in different stages of a pandemic in China. This study takes a developmental perspective to examine the utility of Fangcang hospitals in response to the evolving COVID-19 pandemic. Our research reveals that Fangcang hospitals do not consistently receive positive feedback from the public. I have uncovered the importance of promptly establishing functional Fangcang hospitals in the early stages of a large-scale infectious disease outbreak, as they provide crucial emergency medical services and contribute to epidemic control and public

reassurance. However, I have also identified limitations and challenges associated with the practical operation of Fangcang hospitals, particularly during the mid-phase of an epidemic. Notably, as the infectious disease evolves and its transmission becomes less severe, our study reveals a significant decline in individuals' willingness to enter Fangcang hospitals for centralized isolation and treatment.

Specifically, during the initial stages of an epidemic, the prompt establishment of Fangcang hospitals proves to be of utmost importance. These facilities offer readily available and accessible essential medical resources, including isolation spaces and medical services, helping alleviate the burden on the healthcare system. For example, when hospitals are overwhelmed and unable to accommodate the surge in infected individuals, Fangcang hospitals provide vital support by quickly expanding the capacity for isolation and treatment, ensuring prompt and widespread medical care for patients. This significantly aids epidemic control efforts and boosts public confidence.

However, our research also reveals several challenges faced by Fangcang hospitals during their practical implementation. For instance, I have found issues related to limited medical interventions and suboptimal living conditions within these facilities during the mid–phase of an epidemic. Limited healthcare resources and constrained facilities may hinder the provision of personalized medical treatments for patients with varying disease severity. Additionally, the purpose of constructing Fangcang hospitals is to accommodate as many patients as possible for effective isolation and treatment of the infectious disease, and the practical conditions of the facilities may result in relatively lacking or delayed provision of adequate living conditions, impacting the overall quality of life for patients.

Our survey results also indicate a significant decline in individuals' willingness to enter Fangcang hospitals for centralized isolation and treatment as the epidemic approaches its end. As the virus's infectiousness decreases and symptoms become milder, individuals may prefer self-isolation at home or seek medication-based treatment only. This shift in inclination reflects a different public opinion compared to the earlier stages and mid-phase of Fangcang hospitals, highlighting that the conditions for using Fangcang hospitals are not uniform throughout the entire

epidemic period.

In conclusion, our research findings emphasize the importance of promptly establishing and utilizing Fangcang hospitals in the early stages of an epidemic. They serve as crucial emergency facilities, providing essential medical services and contributing to epidemic control. However, challenges related to targeted medical interventions and living conditions within Fangcang hospitals exist during the mid-phase of an epidemic. Additionally, the declining inclination of individuals to enter these facilities towards the end of an epidemic is a noteworthy factor to consider. These research findings provide valuable insights for the effective management and utilization of Fangcang hospitals during future large–scale infectious disease outbreaks.

6.2 Limitations of the Study

Although valuable insights have been gained from this study, it is important to acknowledge the limitations and potential sources of bias that may have influenced the research findings. These limitations highlight areas for further exploration and improvement in future studies.

Firstly, the generalizability of the research findings may be limited due to the specific context of the study. This study primarily focused on the role and effectiveness of Fangcang hospitals in China during the COVID-19 pandemic, highlighting regional characteristics and specific circumstances. As a result, the findings may not directly apply to other countries or different infectious diseases. Future research could consider conducting cross-cultural comparisons or examining the effectiveness of Fangcang hospitals in different healthcare systems.

Although valuable insights have been gained from this study, it is important to acknowledge the limitations and potential sources of bias that may have influenced the research findings. These limitations highlight areas for further exploration and improvement in future studies.

Additionally, there are inherent limitations in the use of firsthand accounts for

frequency analysis. While frequency analysis is a quantitative method, the data is still influenced by recall bias and the personal or societal biases of the narrators. The narrators may be subject to memory limitations, subjective interpretations, or social expectations, leading to certain biases when recording events or experiences. Although efforts were made to interpret the frequency data cautiously, some degree of bias may still be present.

Furthermore, in the survey phase, researchers may face limitations regarding the sample's representativeness and selection bias. Given the unique nature and limitations of Fangcang hospitals, the survey sample may not cover all segments of the population and may only include specific participants. This can result in limited generalizability of the survey results to the entire target population. Additionally, there may be biases in the participation rate, with only a subset of the population participating in the survey, which can affect the representativeness and reliability of the results.

Moreover, this study primarily focused on the COVID-19 pandemic period, and future research could consider longitudinal designs or comparative analyses across multiple outbreaks to gain a more nuanced understanding of the challenges and adaptations faced by Fangcang hospitals over time.

The absence of qualitative research methods such as interviews or focus groups may have resulted in a lack of richer insights into the complexity and subtle differences in managing Fangcang hospitals during a pandemic.

Lastly, due to time and resource constraints, this study could not comprehensively examine all aspects of Fangcang hospital management and their impact on various stakeholders. Further research can delve deeper into specific areas such as patients' mental health, training and support systems for healthcare workers, or technological integration in hospital operations.

By acknowledging these limitations, future research efforts can address these gaps and contribute to a more comprehensive understanding of Fangcang hospitals and their role in pandemic response and hospital management.

6.3 Suggestions for Future Research in the Field

Based on the limitations identified in this study, several recommendations are proposed for future research in the field of cabin hospitals during pandemics. These suggestions aim to address the limitations of this study and enhance a comprehensive understanding of the effectiveness and management of cabin hospitals.

Future research can focus on conducting cross-cultural comparisons to examine the effectiveness and limitations of cabin hospitals in different countries and regions with diverse healthcare systems and cultural backgrounds. This will provide a more comprehensive understanding of the applicability and contextual factors influencing cabin hospitals' effectiveness.

To overcome the limitations of relying solely on subjective participant experiences, future research can consider integrating objective measurements and observational data. For example, expanding the scope of surveys to include input from all stakeholders involved in cabin hospitals or incorporating primary healthcare records. These approaches can provide a more comprehensive and objective assessment of cabin hospital operations and outcomes.

Future research can adopt a longitudinal design to compare the performance of cabin hospitals during various outbreaks or stages of an epidemic, rather than focusing solely on specific diseases. This will help to examine in greater detail the challenges and adaptations faced by cabin hospitals over time, in response to evolving infectious disease dynamics.

In-depth investigations into the psychological well-being of isolated patients, training and support systems for healthcare personnel, and the integration of technology in hospital operations can provide valuable insights for effective management strategies of cabin hospitals. Understanding the impact of cabin hospitals on these aspects will contribute to the development of comprehensive and effective management approaches.

Given the limited scope of this study, future research can further explore specific areas related to the management of cabin hospitals. For example, investigating

leadership capabilities in nursing practices, effective disinfection procedures, communication strategies employed within cabin hospital facilities, coordination among different healthcare settings, or long-term effects on local healthcare infrastructure.

In summary, future research endeavors should address the limitations of this study and strive for more comprehensive and contextually nuanced investigations. By incorporating cross-cultural comparisons, objective measurements, longitudinal designs, and examining specific aspects of cabin hospital management, a deeper understanding of the effectiveness and management of cabin hospitals during pandemics can be achieved.

6.4 Recommendations for Effective Hospital Management during Pandemics

Based on the findings and limitations of this study, several recommendations are proposed for effective hospital management during pandemics, particularly in the context of cabin hospitals:

Timely recognition of the evolving situation is crucial in the early stages of an outbreak. If necessary, functional cabin hospitals should be established promptly. Establishing readily available and well–equipped cabin hospitals during the surge of infected cases allows for rapid admission of a large number of patients, providing necessary healthcare resources including isolation spaces and medical services. This helps alleviate the burden on healthcare systems and ensures universal and timely treatment for patients.

Efforts should be made to enhance the level of medical services provided by cabin hospitals during the mid–phase of an outbreak, addressing the limitations and challenges faced. This includes improving the targeted medical interventions for patients with varying degrees of disease severity, facilitating access to other medical services for infectious disease patients, and addressing issues related to living conditions. Adequate healthcare resources and facilities should be provided to deliver personalized medical care and measures should be taken to ensure better living

conditions for patients, promoting their overall well-being within the cabin hospital.

Investment in public awareness and educational campaigns is necessary to promote understanding of the importance and effectiveness of establishing cabin hospitals for patient admission during a pandemic. Furthermore, strengthening communication channels between government agencies and the general public, establishing clear and transparent communication platforms, and providing accurate and up–to–date information while also addressing public concerns are essential. This helps enhance public awareness, reduce panic, build trust and confidence in these facilities, and ensure better compliance with isolation and treatment protocols.

Effective hospital management during pandemics requires strong collaboration and coordination among various stakeholders, including healthcare providers, government agencies, and community organizations. Establishing clear communication channels and delineating responsibilities facilitate information sharing, resource allocation, and decision–making processes. Interdisciplinary collaboration can bring about more comprehensive and efficient management strategies.

Hospital management strategies should be flexible and adaptable to evolving situations and the changing patterns of the pandemic. This includes adjusting cabin hospital capacity based on disease incidence and severity, rapidly expanding or downsizing as needed. It is advisable to assemble a team of experienced experts from social sciences, medicine, infectious diseases, health policy, health economics, and crisis management for continuous monitoring and evaluation to identify areas for improvement and make corresponding adjustments to strategies.

Integration of technology and data systems can greatly enhance hospital management during pandemics. This includes implementing telemedicine solutions, remote patient monitoring, and data-driven decision-making processes. Digital platforms facilitate efficient patient triage, contact tracing, and resource management, thereby improving overall hospital operations.

Regular training and preparedness exercises should be provided for healthcare professionals and support staff involved in cabin hospital management. This ensures that they possess the necessary skills, knowledge, and protocols to effectively respond

to a pandemic. Incorporating lessons learned from past experiences into training programs strengthens preparedness for future outbreaks.

These recommendations aim to improve the establishment and operation of cabin hospitals in the future, enhancing preparedness, response, and overall management during pandemics. Effective utilization of cabin hospitals and the implementation of appropriate management strategies contribute to better disease control, efficient resource allocation, and ultimately improved patient outcomes.

References

Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., ... & Cao, B. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The lancet, 395*(10223), 497–506. https://doi.org/10.1016/S0140–6736(20)30183–5

Shang, L., Xu, J., & Cao, B. (2020). Fangcang shelter hospitals in COVID-19 pandemic: the practice and its significance. *Clinical Microbiology and Infection*, *26*(8), 976-978. https://doi.org/10.1016/j.cmi.2020.04.038

David, F. R. (2011). Strategic management concepts and cases. Prentice hall. https://doi.org/10.1093/benz/9780199773787.article.b00145823

Ferlie, E., & Ongaro, E. (2022). Strategic management in public services organizations: Concepts, schools and contemporary issues. Routledge. https://doi.org/10.4324/9781003054917-1

Ginter, P. M., Duncan, W. J., & Swayne, L. E. (2018). The strategic management of health care organizations. John Wiley & Sons. https://doi.org/10.5005/jrfhha-1-1-33

Dafny, L. S., & Lee, T. H. (2016). Health Care Needs Real Competition. *Harvard business review, 94*(12), 76-87.

Ghoshal, S., & Istney, D. E. (1991). Organizing competitor analysis systems. *Strategic Management Journal, 12*(1), 17-31. https://doi.org/10.1002/smj.4250120103

Belton, P. (2017). An Analysis of Michael E. Porter's Competitive Strategy: Techniques for Analyzing Industries and Competitors. CRC Press. ISBN 978-1-912281-06-0 (e-book)

Almquist, E., Senior, J., & Bloch, N. (2016). The elements of value. *Harvard business review, 94*(9), 47-53.

Kumar, V., Jones, E., Venkatesan, R., & Leone, R. P. (2011). Is market orientation a source of sustainable competitive advantage or simply the cost of competing?. *Journal of marketing, 75*(1), 16-30. https://doi.org/10.1509/jmkg.75.1.16

Emanuel, E. J., Persad, G., Upshur, R., Thome, B., Parker, M., Glickman, A., ... & Phillips, J. P. (2020). Fair allocation of scarce medical resources in the time of Covid-19. *New England Journal of Medicine, 382*(21), 2049-2055. https://doi.org/10.1056/nejmsb2005114

Grinshpun, S. A., Yermakov, M., & Khodoun, M. (2020). Autoclave sterilization and ethanol treatment of re-used surgical masks and N95 respirators during COVID-19: impact on their performance and integrity. *Journal of Hospital Infection, 105*(4), 608-614. https://doi.org/10.1016/j.jhin.2020.06.030

Remuzzi, A., & Remuzzi, G. (2020). COVID-19 and Italy: what next?. *The lancet, 395*(10231), 1225-1228. https://doi.org/10.1016/s0140-6736(20)30627-9

Kim, S. W., Lee, K. S., Kim, K., Lee, J. J., & Kim, J. Y. (2020). A brief telephone severity scoring system and therapeutic living centers solved acute hospital-bed shortage during the COVID-19 outbreak in Daegu, Korea. *Journal of Korean Medical Science, 35*(15). https://doi.org/10.3346/jkms.2020.35.e152

Rubin, G. D., Ryerson, C. J., Haramati, L. B., Sverzellati, N., Kanne, J. P., Raoof, S., ... & Leung, A. N. (2020). The role of chest imaging in patient management during the COVID-19 pandemic: a multinational consensus statement from the Fleischner Society. *Radiology, 296*(1), 172-180. https://doi.org/10.1148/radiol.2020201365

Zhang, X. B., Xiao, W., Lei, J., Li, M. X., Wang, X., Hong, Y. J., ... & Sun, J. (2021). Prevalence and influencing factors of anxiety and depression symptoms among the first-line medical staff in Wuhan mobile cabin hospital during the COVID-19 epidemic: A cross-sectional survey. *Medicine, 100*(21), e25945-e25945. https://doi.org/10.1097/md.0000000000025945

Panzeri, A., Rossi Ferrario, S., & Cerutti, P. (2021). Psychological differences among healthcare workers of a rehabilitation institute during the COVID-19 pandemic: a two-step study. *Frontiers in Psychology, 12*, 636129. https://doi.org/10.3389/fpsyg.2021.636129

Parsons Leigh, J., Kemp, L. G., de Grood, C., Brundin-Mather, R., Stelfox, H. T.,

Ng-Kamstra, J. S., & Fiest, K. M. (2021). A qualitative study of physician perceptions and experiences of caring for critically ill patients in the context of resource strain during the first wave of the COVID-19 pandemic. *BMC Health Services Research*, 21, 1-12. https://doi.org/10.1186/s12913-021-06393-5

Kuang, W., Zeng, G., Nie, Y., Cai, Y., Li, J., Wan, Y., & Qiu, P. (2022). Equity in telemedicine for older adults during the COVID-19 pandemic. *International Health, 14*(3), 329-331. https://doi.org/10.1093/inthealth/ihab058

Elnajjar, S., Thomas, D., Tabbara, O., & Baker, D. (2020). Strengths, weaknesses, opportunities, threats analysis on choice of multi chamber bag or compounded parenteral nutrition. https://doi.org/10.26452/ijrps.v11ispl4.4457

Sun, B., Zheng, J. D., Zhang, S. Y., Lu, M. X., Yuan, H., Wang, J. R., ... & Wang, Z. (2022). SWOT analysis of influenza vaccination promotion of primary care staff based on the perspective of the supplier, customer, and management. *Zhonghua Liuxingbingxue Zazhi, 43*(6), 953-959.

Wang, J., & Wang, Z. (2020). Strengths, weaknesses, opportunities and threats (SWOT) analysis of China's prevention and control strategy for the COVID-19 epidemic. *International journal of environmental research and public health, 17*(7), 2235. https://doi.org/10.3390/ijerph17072235

Pereira, L., Pinto, M., da Costa, R. L., Dias, Á., & Gonçalves, R. (2021). The new SWOT for a sustainable world. *Journal of Open Innovation: Technology, Market, and Complexity, 7*(1), 18. https://doi.org/10.3390/joitmc7010018

Zeng, N., Zhao, Y. M., Yan, W., Li, C., Lu, Q. D., Liu, L., ... & Lu, L. (2023). A systematic review and meta-analysis of long term physical and mental sequelae of COVID-19 pandemic: call for research priority and action. *Molecular psychiatry, 28*(1), 423-433. https://doi.org/10.1038/s41380-022-01614-7

Cai, Y., Huang, T., Liu, X., Xu, G. (2020). The Effects Of "Fangcang, Huoshenshan, And Leishenshan" Fangcang Hospitals And Temperature On The Mortality Of COVID-19. *Med. Infectious-Diseases*, 8, e9578. https://doi.org/10.7717/peerj.9578

Xinhua News Agency. (2020, March 10). 16 Wuhan Cabin Hospitals Cease Operation,

Accumulatively Admitting Over 12,000 Patients. Retrieved from http://www.xinhuanet.com/politics/2020-03/10/c_1125693024.htm

Liu, T., Wu, S., Tao, H., Zeng, G., Zhou, F., Guo, F., & Wang, X. (2020). Prevalence of IgG antibodies to SARS-CoV-2 in Wuhan – implications for the ability to produce long-lasting protective antibodies against SARS-CoV-2. Preprint. https://doi.org/10.1101/2020.06.13.20130252

Cheng, W., Zhang, F., Hua, Y., Yang, Z., & Liu, J. (2020). Development of a psychological first-aid model in inpatients with COVID-19 in Wuhan, China. *General Psychiatry*, 33(3), e100292. https://doi.org/10.1136/gpsych-2020-100292

Luo, H., Liu, J., Li, C., Chen, K., & Zhang, M. (2020). Ultra-rapid delivery of specialty field hospitals to combat COVID-19: Lessons learned from the Leishenshan Hospital project in Wuhan. *Automation in Construction, 119*, 103345. https://doi.org/10.1016/j.autcon.2020.103345

Cheng, W., Zhang, F., Liu, Z., Zhang, H., Lyu, Y., Xu, H., Hua, Y., Gu, J., Yang, Z., & Liu, J. (2020). A psychological health support scheme for medical teams in COVID-19 outbreak and its effectiveness. *General Psychiatry, 33*(5), e100288. https://doi.org/10.1136/gpsych-2020-100288

Jin, X., Duan, Y., Bao, T., Gu, J., Chen, Y., Li, Y., Mao, S., Chen, Y., & Xie, W. (2020). The values of coagulation function in COVID-19 patients. *PLOS ONE*, 15(10), e0241329. https://doi.org/10.1371/journal.pone.0241329

Chen, L., Yuan, R., Ji, X., Lu, X., Xiao, J., Tao, J., Kang, X., Li, X., He, Z., Quan, S., Jiang, L. (2021). Modular Composite Building in Urgent Emergency Engineering Projects: A Case Study of Accelerated Design and Construction of Wuhan Thunder God Mountain/Leishenshan Hospital to COVID-19 Pandemic. *Automation in Construction*, 124, 103555. https://doi.org/10.1016/j.autcon.2021.103555

Zhang, P., Wang, B., Liu, Y., Fan, M., Ji, Y., Xu, H., Xu, M., Chen, S., Li, Q., & Zhang, Z. (2021). Lung Auscultation of Hospitalized Patients with SARS-CoV-2 Pneumonia via a Wireless Stethoscope. *International Journal of Medical*

Sciences, 18(6), 1415-1422. https://doi.org/10.7150/ijms.54987

Chen, X., Lei, L., Liu, S., Han, J., Li, R., Men, J., Li, L., Wei, L., Sheng, Y., Yang, L., Zhou, B., & Zhu, L. (2021). Occurrence and risk assessment of pharmaceuticals and personal care products (PPCPs) against COVID-19 in lakes and WWTP-river-estuary system in Wuhan, China. *Science of The Total Environment*, 792, 148352. https://doi.org/10.1016/j.scitotenv.2021.148352

Long, W., Yang, J., Li, Z., Li, J., Chen, S., Chen, D., Wang, S., Li, Q., Hu, D., Huang, J., Zeng, W., Guo, L., & Wu, X. (2021). Abnormal Fibrinogen Level as a Prognostic Indicator in Coronavirus Disease Patients: A Retrospective Cohort Study. *Frontiers in Medicine*, 8. https://doi.org/10.3389/fmed.2021.687220

World Health Organization. (2023). COVID-19: weekly Epidemiological Update. https://www.who.int/emergencies/diseases/novel-coronavirus-2019

Annexes

A - Questionnaire on Fangcang Hospitals around Shijiazhuang and Results

All questions in the questionnaire are multiple choice questions.

1. Gender:

Options	Subtotal	Ratio
Male	81	47.37%
Female	90	52.63%
Others	0	0%
Total Respondents	171	

2. Age:

Options	Subtotal	Ratio
Under 18	29	16.96%
18-24	64	37.43%
25-34	27	15.79%
35-44	26	15.2%
45-54	18	10.53%
55 and above	7	4.09%
Total Respondents	171	

3. Satisfaction with Medical Services:

Options	Subtotal	Ratio
Very Satisfied	59	34.5%
Satisfied	41	23.98%
Neutral	19	11.11%
Not Satisfied	34	19.88%
Very Dissatisfied	18	10.53%
Total Respondents	171	

4. Admission Period:

Options	Subtotal	Ratio
December 1, 2022 - December 15, 2022	75	43.86%
December 16, 2022 - December 30, 2022	77	45.03%
Not on the above dates	19	11.11%
Total Respondents	171	

5. Length of Stay:

Options	Subtotal	Ratio
1-4 days	16	9.36%
5-8 days	64	37.43%
9-12 days	52	30.41%
13 days and above	39	22.81%
Total Respondents	171	

6. Medical Professionalism of Fangcang Hospitals:

Options	Subtotal	Ratio
Very High	41	23.98%
High	43	25.15%
General	40	23.39%
Low	29	16.96%
Very Low	18	10.53%
Total Respondents	171	

7. Satisfaction with Nursing Services:

Options	Subtotal	Ratio
Very Satisfied	33	19.3%
Satisfied	37	21.64%
Neutral	43	25.15%
Not Satisfied	41	23.98%

Very Dissatisfied	17	9.94%
Total Respondents	171	

8. Bed Arrangement in Fangcang Hospitals:

Options	Subtotal	Ratio
Very Reasonable	43	25.15%
Reasonable	36	21.05%
General	31	18.13%
Unreasonable	42	24.56%
Very Unreasonable	19	11.11%
Total Respondents	171	

9. Sanitary Conditions of Fangcang Hospitals: [Single-choice Question]

Options	Subtotal	Ratio
Very Satisfied	50	29.24%
Satisfied	32	18.71%
Neutral	32	18.71%
Not Satisfied	39	22.81%
Very Dissatisfied	18	10.53%
Total Respondents	171	

10. Quality of Life in Fangcang Hospitals:

Options	Subtotal	Ratio
Very Satisfied	41	23.98%
Satisfied	35	20.47%
Neutral	39	22.81%
Not Satisfied	39	22.81%
Very Dissatisfied	17	9.94%
Total Respondents	171	

11. Effectiveness of Treatment in the Fangcang Hospital:

Options	Subtotal	Percentage
Very Effective	47	27.49%
Effective	36	21.05%
Neutral	26	15.2%
Ineffective	45	26.32%
Very Ineffective	17	9.94%
Total Respondents	171	

12. Satisfaction with the Environment of the Fangcang Hospital:

Options	Subtotal	Percentage
Very Satisfied	41	23.98%
Satisfied	43	25.15%
Neutral	26	15.2%
Not Satisfied	47	27.49%
Very Dissatisfied	14	8.19%
Total Respondents	171	

13. Perceived Adequacy of Psychological Support Provided by the Fangcang Hospital:

Options	Subtotal	Percentage
Very Adequate	52	30.41%
Adequate	38	22.22%
Neutral	22	12.87%
Inadequate	42	24.56%
Very Inadequate	17	9.94%
Total Respondents	171	

14. Self-assessment of Symptom Severity (0-10 scale):

Options	Subtotal	Percentage

10-7	6	3.51%
6-4	9	5.26%
3-0	156	91.23%
Total Respondents	171	

15. Preference for Fangcang Hospital or Home Isolation:

Options	Subtotal	Percentage
Very Inclined	9	5.26%
Inclined	9	5.26%
Neutral	31	18.13%
Not Inclined	59	34.5%
Very Unfavorable	63	36.84%
Total Respondents	171	