



INSTITUTO
UNIVERSITÁRIO
DE LISBOA

Core Competitiveness Strategic Thinking in China's Maternal and Child Healthcare Hospitals: An Exploratory Study

CHEN Qikang

Doctor of Management

Supervisor:

PhD Alvaro Rosa, Associate Professor,
ISCTE University Institute of Lisbon

PhD Wang Dong, Professor,
South Medical University

March, 2021



BUSINESS
SCHOOL

Marketing, Operations and General Management Department

Core Competitiveness Strategic Thinking in China's Maternal and Child Healthcare Hospitals: An Exploratory Study

CHEN Qikang

Doctor of Management

Supervisors:

PhD Alvaro Rosa, Associate Professor,
ISCTE University Institute of Lisbon

PhD Wang Dong, Professor,
South Medical University

March, 2021



BUSINESS
SCHOOL

Marketing, Operations and General Management Department

Core Competitiveness Strategic Thinking in China's Maternal and Child Healthcare Hospitals: An Exploratory Study

CHEN Qikang

Doctor of Management

Jury:

PhD José Manuel Gonçalves Dias, Associate Professor with Habilitation,
ISCTE University Institute of Lisbon

PhD Nuno Araújo, Adjunct Professor,

CESPU – Cooperativa de Ensino Superior Politécnico e Universitário

PhD Virginia Trigo, Emeritus Professor,

ISCTE University Institute of Lisbon

PhD Zhang Chichen, Professor,

Southern Medical University

PhD Alvaro Rosa, Associate Professor with Habilitation,

ISCTE University Institute of Lisbon

March, 2021

iscte

INSTITUTO
UNIVERSITÁRIO
DE LISBOA

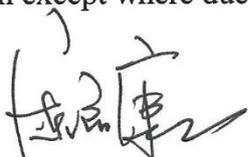
**Core Competitiveness Strategic Thinking in
China's Maternal and Child Healthcare Hospitals:
An Exploratory Study**

CHEN Qikang

Declaration

I declare that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university and that to the best of my knowledge it does not contain any material previously published or written by another person except where due reference is made in the text.

Signed:



Date:

2021.3.21.

Name:

Chen Qikang

作者申明

本人郑重声明：除了论文致谢中明确说明并致以谢意的部分外，所呈交的论文不包含任何他人或作者本人已用于获得任何教育机构的学位和证书而使用过的材料。同时尽我所知，除了文中特别加以标注引用的内容外，本论文不包含任何其他个人或集体已经发表或撰写的成果作品。

作者签名:



日期:

2021.3.21.

姓名(拼音):

Chen Qikang

[This page is deliberately left blank.]

Abstract

In recent years, China has achieved rapid economic and social development. To keep up with the economic growth, China adopted two-child policy and started to reform the medical system. Against such backdrop, there is a huge increase in the demand for women and children's health services. However, the overall service capacity of the maternal and child care service centers in China cannot satisfy the growing demand. Therefore, it is necessary to update development strategies so as to achieve a sustainable and healthy development.

Based on the resource-based view, this thesis studies the core competitiveness of the hospitals. First, we conducted three rounds of Delphi consultation with 32 hospital managers and research experts in public health from eight different institutions to finalize the evaluation index for the core competitiveness specially developed for Chinese maternal and child care service centers. In order to validate the evaluation index, we have proceeded with correlation analysis of core competitiveness with five other maternal and child care service centers of same level in China.

An in-depth the case study of Shunde Maternal and Child Healthcare Hospital. and through SWOT analysis, we have proposed strategies for improving the core competitiveness of Shunde Maternal and Child Healthcare Hospital to adapt to new situations. Last but not least, through analysis of the key influencing factors of the hospital's development in the past decade, we have proved the importance of improving the core competitiveness so as to adapt to changes of the environment.

This study found that VRIO resources and capabilities, dynamic capabilities and unique hospital culture are the three key factors to ensure excellent performances for Shunde Maternal and Child Healthcare Hospital. To be more specific, hospitals should adopt specialization strategies, develop a talent team, improve management and service abilities, develop cooperative medical service system, improve abilities to treat critical and difficult diseases and establish a culture that encourages innovation and people-oriented.

Keywords: China's maternal and child healthcare hospitals, core competitiveness, development strategy, case study

JEL: I11, I18

[This page is deliberately left blank.]

Resumo

Nos anos mais recentes, assistiu-se na China, um acelerado desenvolvimento socioeconómico. A par disso, assistiu-se à introdução da política de “dois filhos” bem como de outras medidas públicas reformativas do sistema de saúde que estão a ser implementadas com grande sucesso. Porém, a capacidade total das maternidades e hospitais pediátricos está, no entanto, longe de ser capaz de satisfazer toda a procura nesta nova era. Consequentemente, é necessário repensar as estratégias de desenvolvimento de modo a atingir um desenvolvimento sustentado da saúde.

Com base na teoria de recursos, a presente tese promoveu uma análise sobre as competências nucleares dos hospitais. Em primeiro lugar, aplicou-se o método *Delphi* com três fases de consulta onde intervieram 32 gestores hospitalares e peritos em saúde pública de oito diferentes instituições para a construção de um índice de avaliação de competências nucleares de centros de maternidade e de pediatria. Para validação do índice de avaliação realizaram-se análises de correlação de competências nucleares com outros cinco centros de maternidade do mesmo nível que o Shunde Maternal and Child Healthcare Hospital.

Elaborou-se um estudo de caso aprofundado do *Shunde Maternal and Child Healthcare Hospital* e, com base neste e na aplicação da análise SWOT foram formuladas estratégias para a melhoria das capacidades organizacionais nucleares do hospital. Por outro lado, a análise de fatores essenciais de desenvolvimento do hospital nos últimos 10 anos, este estudo demonstrou, ainda, a importância da relevação das capacidades organizacionais nucleares na adaptação do hospital às variações da envolvente global.

O presente estudo permitiu concluir que os recursos e capacidades organizacionais VRIO, o domínio das capacidades dinâmicas e a cultura específica do hospital são os três fatores chave de estratégia para que os hospitais pediátricos e de maternidade possam ter um desempenho superior. As medidas mais importantes no quadro das capacidades organizacionais nucleares a reter são a estratégia de especialização, a construção de um sistema de retenção de talentos, melhoria de competências de gestão, a construção de um sistema médico integrado e o estabelecimento de uma cultura de inovação e cuidado com as mães e progénitos.

Palavras-chave: Hospitais Pediátricos e Maternidades da china, competências essenciais, estratégias de desenvolvimento, estudos de caso

JEL: I11, I18

[This page is deliberately left blank.]

摘 要

近年来，随着中国社会经济的飞速发展，全面开放二孩、深化卫生体制改革等政策颁布实施。新时期，妇幼健康需求急剧上升，然而，中国妇幼保健院整体服务能力未能满足民众日益增长需求，应该选择什么样发展战略实现医院可持续健康发展？

本文基于资源基础理论，对医院核心竞争力进行了研究。首先，我们对来自 8 家不同机构的 32 名医院管理者和公共卫生研究专家进行了 3 轮德尔菲咨询，最终确定了专为中国妇幼保健机构开发的核心竞争力评价指标。为了验证评价指标的有效性，我们还与中国其他 5 个同级别的妇幼保健机构进行了核心竞争力的相关分析。

以顺德妇幼保健院为例进行深入案例研究。通过 SWOT 分析，我们提出了适应新形势，提高顺德妇幼保健院核心竞争力的策略。最后，通过对近十年医院发展的关键影响因素的分析，证明了提升医院核心竞争力以适应环境变化的重要性。

本研究发现，异质性（VRIO）资源与能力、动态能力的掌握、独特的医院文化是 SD 妇幼保健院确保卓越绩效战略的三个关键要素；提升医院核心竞争力的主要措施是：实施专一化战略，构建精英人才体系，创新管理及服务能力，打造整合型医疗保健服务体系，提升疑难疾病诊治能力，建立“以人为本及鼓励创新”的文化。

关键词：中国妇幼保健院，核心竞争力，发展战略，案例研究

JEL: I11, I18

[This page is deliberately left blank.]

Acknowledgments

In 2006, I, as a clinical surgeon, began to get engaged in hospital management. In medical management, I kept learning and growing, getting a master degree in public administration in 2012. Since then, I have served as Director of medical department and Deputy Director of the hospital. In 2012, I acted as Director of the hospital.

As Director of the hospital, which is a new post for me and plays an important role, I deeply feel that I need to master more theoretical knowledge of management. From 2018 to 2021, I was lucky to study in Doctor of Management in Healthcare Program jointly held by Southern Medical University and ISCTE Lisbon University Institute. I have made great progress in a lot of fields, from basic management to hospital management, from micro aspects to macro ones, from practice to theoretical supplement, and from theoretical guidance to daily management. During these three years, in hospital management, I truly enjoyed the harvest of going beyond myself.

I would like to thank Southern Medical University and ISCTE Lisbon University Institute for giving me such a good chance for learning. I also appreciate my supervisor Prof. Alvaro Rosa's meticulous support and assistance in topic selection, data collection, analysis plans and writing of this thesis. I want to express my sincere thanks to Prof. Alvaro Rosa for his help in my studying, working, cultivation of style of scientific research and abilities during the past three years.

I also want to thank Prof. Virginia Trigo and Prof. Nelson Antonio for their careful guidance and help. They have offered me great help in entrance assessment, knowledge imparting and writing of this thesis. Thanks to their encouragement and support, I managed to successfully complete the writing of this thesis.

I am also grateful to Prof. Wang Dong. Under his guidance and encouragement, I constantly learned theoretical knowledge of management, research methods, writing modes and ultimately completed the writing after several drafts.

I would like to express special gratitude to Mr. Zeng Qiyi, former Director of Zhujiang Hospital, and Ms. Ouyang Xueqiao of Foshan Shunde Maternal and Child Healthcare Hospital. They have encouraged, supported and helped me to pursue the doctoral degree of management in healthcare.

I want to thank the leaderships of Foshan Shunde Maternal and Child Healthcare Hospital for their assistance in research and consulting. I want to express my thanks to Ms. Zeng Na for her great efforts in data collection, data analysis, and polishing of this thesis.

I also appreciate Ms. Xu Ruimin, Director of Doctor of Management in Healthcare jointly held by Southern Medical University and ISCTE Lisbon University Institute, and Ms. Ou Weiyan for their encouragement, support and help for me.

I want to thank Ni Jingdong, Dean of School of Public Health of Guangdong Medical University, Prof. Sui Xueli of School of Public Administration of Beihang University, Prof. Chen Hongxun of HCM CONSULTING COMPANY, Zheng Tingyi, Supervisor of Filsoul Health Management Company, and Ms. Chen Jingyi for their help and support.

Last but not least, I would like to express my heartfelt gratitude to my family for their understanding, care, encouragement and help in my academic pursuit.

I also want to thank those who have made contribution to the construction and development of Foshan Shunde Maternal and Child Healthcare Hospital. This thesis is for Foshan Shunde Maternal and Child Healthcare Hospital.

致 谢

2006年，我从一名临床外科医生开始接触医院管理工作。在医学管理领域里，我不断的学习成长，2012年获得了公共管理硕士学位，并逐成长为医务科主任、副院长，2012年任职医院院长。

走上院长这一新的重要管理岗位后，我深深感受到自己管理学理论知识的不足。2018年至2021年期间，我有幸走进南方医科大学/葡萄牙里斯本工商管理大学医药管理博士学位项目（Doctor of Management in Healthcare Program）学习。从管理学基础到医院管理，从微观到宏观，从实践到理论补充，再从理论指导日常管理，三年多的学习，在医院管理领域里，无论理论，还是实践以及思维方式等方面都得到较大的提升，真正享受到超越自我的收获。

感谢南方医科大学/葡萄牙里斯本工商管理大学给予我一个很好的学习机会。感谢导师鲁逊(Alvaro Rosa)教授本课题从选题、资料收集、分析方案到论文撰写给予的无微不至的支持和帮助。衷心感谢导师在我三年的学习、工作、科研作风养成和能力培养的帮助！

感谢维吉尼亚（Virginia Trigo）教授、纳尔逊（Nelson Antonio）教授等对我的悉心指导和帮助。从入学考核到知识的传授与以及学位论文撰写等给予多次指导。在他们的鼓励与支持下，我得以顺利完成学位论文。

感谢王冬 (Wang Dong) 教授，在他的细心指导、真诚鼓励下，我不断的学习管理学理论知识、研究方法、论文书写方式，最终数易其稿，完成论文的书写。

特别感谢原珠江医院院长曾其毅先生以及原佛山市顺德区妇幼保健院欧阳雪乔女士，是他们鼓励、支持和帮助我攻读医药管理博士学位项目。

感谢佛山市顺德区妇幼保健院班子团队及中层干部团队，协助开展本论文的调查，咨询工作。感谢曾娜女士，为本研究的资料收集、数据分析、文字润色等方面付出的大量辛勤劳动。

感谢南方医科大学与葡萄牙里斯本工商管理大学合办的公共卫生政策与管理博士学位项目主任许睿敏（Xu Ruimin）女士及欧玮艳（Ou Weiyang）女士对我学习的鼓励、支持和帮助。

感谢广东医科大学公卫学院院长倪敬东院长、北京航空航天大学公共管理学院隋学礼教授、上海世瑞方华医院管理咨询有限公司陈宏勋教授、台湾丰硕医院管理公司郑婷伊总监、陈靖怡女士为本研究提供的帮助和支持。

感谢我的家人对我追求学业的理解、爱护、鼓励和帮助。

感谢所有为佛山市顺德区妇幼保健院的建设和发展做出过贡献的人们。谨以此论文献给为之而努力奋斗的佛山市顺德区妇幼保健院。

Contents

Chapter1: Introduction	1
1.1 Research background	1
1.1.1 Status quo of maternal and child healthcare system in China	1
1.1.2 Great adjustment of China's health strategy in the new era	5
1.1.3 Problems existing in the development of China's maternal and child healthcare hospitals in the new era	7
1.1.4 Future development trend of maternal and child healthcare in China.....	10
1.2 Research questions.....	13
1.3 Research significance.....	13
1.3.1 Theoretical significance.....	13
1.3.2 Practical significance	14
1.3.3 Innovations	14
1.4 Thesis structure	15
1.5 Research framework and technology road-map	17
Chapter 2: Literature review	19
2.1 Organizational strategy and competitive advantage	19
2.1.1 Evolution of organizational strategy.....	19
2.1.2 Competitive advantage	23
2.1.3 Differences between hospital development strategy and enterprise development strategy.....	24
2.2 Resource-based view (RBV).....	25
2.2.1 Resource	26
2.2.2 Organizational capabilities (ordinary capabilities).....	27
2.2.3 Hospital resources and organizational capabilities.....	28
2.3 Dynamic Capability Theory.....	30
2.3.1 Dynamic capabilities	30
2.3.2 Hospitals' dynamic capabilities.....	31
2.4 Core competitiveness	32
2.4.1 Definition of core competitiveness.....	33
2.4.2 Characteristics of core competitiveness	34

2.5 Hospital core competitiveness	37
2.5.1 Characteristics of hospital core competitiveness.....	38
2.5.2 Constituent factors of hospital core competitiveness	39
2.5.3 The role and mechanism of hospital core competitiveness	41
2.5.4 Research on core competitiveness in typical hospitals.....	42
2.5.5 Model hypothesis of the research of hospital core competitiveness	44
2.6 Summary	44
Chapter 3: Research Methods	47
3.1 Research design	48
3.2 Research methods	50
3.2.1 Data collection.....	50
3.2.2 Data collection and analysis	53
Chapter 4: Evaluation Index System of Core Competitiveness of Maternal & Child Healthcare Hospital	57
4.1 Delphi method.....	57
4.1.1 Basic information of experts.....	57
4.1.2 First-round survey results	58
4.1.3 Second-round survey results.....	59
4.1.4 Third-round survey results.....	63
4.1.5 Summary of third-round survey results	71
4.2 Comprehensive evaluation model of core competencies of maternal and child healthcare hospitals.....	72
4.3 Empirical results	73
4.3.1 Empirical methods.....	73
4.3.2 Empirical results	73
4.3.3 Model validation.....	74
4.4 Summary	78
Chapter 5: Case Study	81
5.1 Survey results of staff of SD Maternal and Child Healthcare Hospital	81
5.2 Survey results of customer demand of SD Maternal and Child Healthcare Hospital.	81
5.3 Round-table conferences.....	82
5.4 Analysis of key factors behind the development of SD Maternal and Child Healthcare Hospital in the past 10 years	83
5.4.1 Operation status of SD Maternal and Child Healthcare Hospital from 2010 to 2019	83

5.4.2 Patient and employee satisfaction.....	85
5.4.3 Analysis of core competencies of SD Maternal and Child Healthcare Hospital in the past 10 years	85
5.5 SW analysis: internal resources, capabilities, dynamic capabilities and cultural analysis of SD Maternal and Child Healthcare Hospital	88
5.5.1 Human resources	89
5.5.2 Information construction	90
5.5.3 Social relations resources	90
5.5.4 Strategic management capabilities	91
5.5.5 Technological innovative capabilities	92
5.5.6 Medical services capabilities	93
5.5.7 Jurisdictional management capabilities	93
5.5.8 Hospital culture.....	94
5.5.9 SW analysis summary of SD Maternal and Child Healthcare Hospital	94
5.6 OT analysis: PESTEL analysis of SD Maternal and Child Healthcare Hospital.....	95
5.6.1 Political factors	96
5.6.2 Economic factors	98
5.6.3 Social environment	99
5.6.4 Technological environment	100
5.6.5 Environmental factors.....	101
5.6.6 Legal factors	102
5.6.7 OT analysis summary of SD Maternal and Child Healthcare Hospital.....	103
5.7 SWOT matrix analysis of SD Maternal and Child Healthcare Hospital	104
5.8 SD Maternal and Child Healthcare Hospital	107
5.8.1 Market positioning and strategic positioning	107
5.8.2 Specific strategic measures.....	108
5.9 Implementation steps	118
5.10 Guarantee measures for strategic improvement of SD Maternal and Child Healthcare Hospital's score competitiveness	123
5.10.1 Organization structure security.....	123
5.10.2 System guarantee	123
5.10.3 Funding guarantee	125
5.10.4 Information technology support	125
5.11 Improvement strategy evaluation of SD Maternal and Child Healthcare Hospital's core competitiveness	126

5.12 Strategic control to improve SD Maternal and Child Healthcare Hospital’s core competitiveness.....	127
5.13 Improvement strategy adjustment and reform of SD Maternal and Child Healthcare Hospital’s core competitiveness	127
5.14 Summary.....	128
Chapter 6: Discussion, Conclusions and Limitations.....	131
6.1 Overview.....	131
6.2 Research discussion	131
6.2.1 What is the core competitiveness of maternal and child healthcare? How is the core competitiveness of maternal and child health care hospitals defined?	131
6.2.2 How to cultivate the core competitiveness of maternal and child health care hospitals?	136
6.2.3 What is the important role of enhancing the core competitiveness of maternal and child health care hospitals in an environment of reform?	139
6.3 Major conclusions.....	140
6.3.1 Redefining the core competitiveness of Chinese medical institutions and Chinese maternal and child healthcare hospitals.....	140
6.3.2 Preliminary discussion on the strategic countermeasures to enhance the core competitiveness of SD Maternal and Child Healthcare Hospital.....	141
6.3.3 The capability of enhancing core competitiveness can bring competitive advantage to maternal and child healthcare hospitals in the new era.....	141
6.3.4 The scientificity and accuracy of the comprehensive evaluation model of Chinese maternal and child healthcare hospitals’ core competitiveness.....	142
6.4 Research contributions.....	142
6.4.1 Theoretical contribution	142
6.4.2 Influence of hospital management.....	143
6.5 Limitations	144
6.6 Topics for future research	145
Bibliography.....	147
Webliography.....	151
Other References	153
Annex A	155
Annex B.....	157
Annex C.....	159
Annex D	161

Annex E..... 163
Annex F..... 179
Annex G 183
Annex H 189
Annex I: Relevant Tables 195
Annex J: Relevant Figures 205

[This page is deliberately left blank.]

List of Tables

Table 1.1 Differences between maternal and child healthcare hospitals and general hospitals	4
Table 2.1 Classification of dynamic capabilities.....	31
Table 2.2 Components of core competitiveness.....	35
Table 2.3 Core competitiveness of case hospitals at home and abroad.....	43
Table 3.1 Research contents and methods.....	48
Table 3.2 Case study tactics	49
Table 3.3 Comparative analysis strategies	50
Table 3.4 Quality control of research process	53
Table 4.1 Summary of the results of the questionnaire: factors affecting the core competitiveness of the Maternal & Child Healthcare Hospitals	58
Table 4.2 Experts' familiarity with the scheme and the assignment of judgment basis.....	60
Table 4.3 Expert familiarity coefficient	60
Table 4.4 Expert judgment coefficient.....	61
Table 4.5 Authority coefficient on expert opinions of the level-1 indicators.....	62
Table 4.6 Authority coefficient on expert opinions of the level-1 indicators.....	64
Table 4.7 First-level indexes scores and total scores of the six hospitals using the composite grade method.....	75
Table 4.8 Scores and ranking of total scores of the first-level indexes of six hospitals using the composite grade method.....	75
Table 4.9 Ranking of ten hospitals by using the weighted TOPSIS method.....	77
Table 4.10 Ranking of ten hospitals by using three comprehensive evaluation methods	78
Table 4.11 Correlation of the ranking of three comprehensive evaluation methods.....	78
Table 5.1 The results of round-table conferences	82
Table 5.2 Third-party satisfaction survey of public hospitals in Shunde District, Guangdong Province	85
Table 5.3 Analysis of core competency elements of SD Maternal and Child Healthcare Hospital from 2010 to 2019.....	86
Table 5.4 Steps for SD Maternal and Child Healthcare Hospital to enhance core development strategy and stage goals in the next 5 years	119

Table 5.5 2020-2025 phased development projects and the budget of SD Maternal and Child Healthcare
Hospital (unit: 10,000 yuan)..... 125

List of Figures

Figure 1.1 Research framework	17
Figure 2.1 Source evolution of enterprise competitive advantage	21
Figure 2.2 Competitive advantage strategies in RBV	28
Figure 2.3 Mechanism of core competitiveness	42
Figure 2.4 Research model of Hospitals' core competitiveness	44
Figure 5.1 SWOT matrix analysis of SD Maternal and Child Healthcare Hospital	106

[This page is deliberately left blank.]

Chapter1: Introduction

1.1 Research background

With the constant deepening of the reform of the social-economic system and further improvement of people's living conditions in China, people pay more attention to and have higher expectations for mother-infant safety and children's health.

The "Report on the Work of the Government 2018" (State Council, 2018) pointed out that "Maternal and child healthcare (MCH) services should be improved at the national level", which shows that, in the context of comprehensive health, MCH will be an important part of China's medical and health work.

According to the "Measures for Administration of MCH Institutions" (China's Ministry of Health, 2006), China's MCH institutions are the major institutions undertaking maternal and child medical healthcare services and their major functions are providing women and children with health education, prevention, healthcare, and other health services, and at the same time, carrying out some basic medical services which are closely related to women and children's health.

Facing the new situation of the deepened reform of medicine and health system at the new era, MCH institutions should not only seize the opportunities created by the unprecedented improvement of the philosophy of national comprehensive health and the implementation of the universal two-child policy, but also cope with the challenges resulted from the hierarchical medical system, the replacement of "supporting doctors' profit from excessive drug expense" with "supporting doctors with skills", and the strong competitiveness of private and comprehensive medical institutions.

1.1.1 Status quo of maternal and child healthcare system in China

1.1.1.1 Definition of China's maternal and child healthcare hospitals

China's maternal and child healthcare hospitals/China's maternal and child Healthcare Hospital centers: maternal and child healthcare hospitals in China are established by the government and are divided into provincial, municipal and county-level hospitals according to the administrative divisions. The hospitals at all levels carry out hierarchical management and

implement the mechanism of interacting and communicating with each other to form a three-level management network for maternal and child healthcare. Based on the work related to group healthcare, the maternal and child healthcare hospitals (China's Ministry of Health, 2006) are mainly oriented to the grassroots level insisting on disease prevention as the main task, to provide public health services such as health education and preventive healthcare for women and children, and at the same time, they also offer basic medical services closely related to the health of women and children. Maternal and child healthcare hospitals in China include maternal and child healthcare hospitals as well as maternal and child healthcare centers/stations.

1.1.1.2 Development history of maternal and child healthcare system in China

Maternal and child healthcare is an important part of China's health cause. Since the founding of the People's Republic of China, the maternal and child healthcare system has been established from scratch, and a three-level maternal and child healthcare network has been established. The level of women and children health has been greatly improved. Its development has experienced three stages: growth stage, maturity stage and rapid development stage (Department of Maternal and Child Healthcare, 2019). **Growth stage: 1949 to 1978.** In October 1949, the Ministry of Health of China was formally established, and the Maternal and Child Healthcare Bureau was one of its subordinate institutions. The local health departments at all levels set up maternal and child healthcare departments (sections) accordingly and established a top-down maternal and child healthcare administrative system with Chinese characteristics. Subsequently, China began to establish professional institutions for maternal and child healthcare the following year (Lv & Hao, 2008). **Maturity stage: 1978 to 2012.** With the implementation of the national policy of reform and opening up, China has established a set of maternal and child healthcare operation mechanism that is independent of the general hospitals and has Chinese characteristics. During this period, the Chinese government formulated 176 policies related to maternal and child health are (Li et al., 2011).

Rapid development stage: 2012 to present. In 2012, the World Health Organization announced to the world that China had eliminated maternal and neonatal tetanus, marking the beginning of a shift in China's maternal and child healthcare work from "striving for survival" to "promoting development". In 2018, the National Health Commission of China issued the Mother and Infant Safety Action Plan (2018-2020) to promote maternal and infant safety as well as the Healthy Children Action Plan (2018-2020) for children's health, both of which aim to strengthen the mother and infant safety and security system and fully protect the health of women and children. Over the past 70 years, the development of maternal and child healthcare

in China has made world-renowned achievements, and China's maternal and child health policy system, management process and service chain have gradually been improved (Department of Maternal and Child healthcare, 2019). China has been rated by the World Health Organization as a high-performance country for maternal and child healthcare (Sun, 2017). By 2018, there were 3,080 maternal and child healthcare institutions in China, with 520,800 maternal and child healthcare practitioners. The annual outpatient volume was 400 million, and the annual hospitalization volume was 13.79 million. Compared with the figures in 1991, the maternal mortality rate in China dropped by 79.4%; the neonatal mortality rate dropped by 88.2%; the infant mortality rate dropped by 87.8%; the mortality rate of children under five years old dropped by 86.2%. It can be seen that the health of women and children has achieved leapfrog development.

1.1.1.3. Functions of maternal and child healthcare hospitals in China

Maternal and child healthcare hospitals in China are divided into provincial, municipal and county-level hospitals. The hospitals at all levels implement hierarchical management and they interact and communicate with each other to form a three-level management network for maternal and child healthcare. The provincial maternal and child healthcare hospitals are generally responsible for the overall planning of maternal and child healthcare across the province and undertake related management work such as planning regional business and analyzing maternal and child health data; the municipal maternal and child healthcare hospitals are the connecting link between provincial and county-level hospitals, mainly improving the maternal and child healthcare service capacity within the region, giving full play to the characteristics of local development and offering featured services; the county-level maternal and child healthcare hospitals serve as the cornerstone in the three-level network and mainly are responsible for the health education and maternal and child health services for the appropriate population in their respective jurisdictions.

The Law of the People's Republic of China on Maternal and Infant healthcare clearly stipulates that maternal and child healthcare hospitals cannot be treated the same as general hospitals or epidemic prevention agencies, because any medical and healthcare service of maternal and child healthcare centers should take into consideration the characteristics of women and children. The maternal and child healthcare hospitals of China mainly serve women and children and offer three levels of preventive health services including health education, antenatal examination, childbirth, disease screening, and outpatient and inpatient treatment. Through an integrated service model that combines prevention and quality, outpatient and

inpatient services, inside-hospital and outside-hospital treatment, and group and individual services, the maternal and child healthcare hospitals offer active medical health care to women and children nationwide, covering their entire life cycle. (See Table 1.1).

Table 1.1 Differences between maternal and child healthcare hospitals and general hospitals

Item	Maternal and Child Healthcare Hospitals	General Hospitals
Function	Offering primary, secondary and tertiary services, mainly primary and secondary services;	Medical service institutions, mainly tertiary clinical medical care
Positioning	Prevention+medical care+jurisdiction management	care
Group Features	Disadvantaged groups: women, children; sub-healthy people, patients Children under 18 years old, mainly infants and kids; mainly women of child-bearing age	Most are patients with also some in the condition of sub-health, covering all ages, mainly grownups and old-age people
Department Setting	Four healthcare departments according to patient groups: pregnancy and childbirth healthcare department, women healthcare department, child healthcare department, and family planning department; the secondary departments are set according to tertiary service contents and also includes jurisdiction management	Internal medicine department, surgery department, radiotherapy department and so on according to treatment methods; cardiovascular department, respiratory medicine department, gastroenterology department and so on according to anatomic sites; pediatrics department, gynecology department, geriatrics department and so on according to group of patients
Service Contents	Primary: health education, normal prenatal examination, childbirth, assessment; secondary: child and woman disease screening diagnosis and treatment; tertiary: outpatient and inpatient diagnosis and treatment.	Treatment of all kinds of diseases with a small amount of physical examination
Combination	Four combinations: prevention and treatment, inside-hospital and outside-hospital, outpatient and inpatient, and group and individuals	Single medical service, only within the hospital and targeted at patients
Integration	One integration: using comprehensive approaches to resolve health problems, including health education, health consultation, drug therapy, surgery and traditional Chinese medicine	Little health education and health consultation, mainly drug therapy and surgery
Service Features	Three targets: being targeted at different groups, different ages and different health problems. Offer continuous full life-cycle active services	Being targeted at disease treatment in the outpatient or hospitalization stage; patients come to the hospital and there is no active service offered by the hospital

1.1.1.4 Development of maternal and child healthcare hospitals abroad

Due to the different management mechanisms, there is no special maternal and child healthcare institutions set up abroad, but their advanced maternal and child health management and service philosophy is worth learning. The advantages of foreign maternal and child health management are summarized as follows: 1. The management is standardized, the responsibilities are clear and the work objectives are targeted; 2. The health planning is reasonable, with attention paid

to the grassroots level and the community; 3. The talent training is targeted, with importance attached to the training of grassroots medical service personnel (Cheng, 2014).

As one of the countries with the highest degree of medical marketization, the United States safeguards the health of American women and children by establishing mechanisms for broad coverage of government subsidies for the poor, social insurance and reasonable referrals, and by having the government purchase services from institutions that provide maternal and child health services. Maternal and child healthcare in the United States (Chen et al., 2010) is coordinated by the US Public Health Service. Medical services are provided by a service complex composed of various hospitals, family doctors and other organizations. Family doctors are the main group providing maternal and child healthcare. The training of talents in the US maternal and child healthcare institutions is mainly divided into two perspectives of family doctors and specialist physicians.

There are similarities in the management of maternal and child healthcare institutions in China and Australia. In Australia (Gu, 2018), the maternal and child healthcare is managed by federal and state government maternal and child healthcare institutions, forming a hierarchical system of national hospitals, state hospitals, community health service centers, general medical clinics, and medical university affiliated hospitals. However, unlike China's maternal and child healthcare tasks which are concentrated in general hospitals and high-level hospitals, Australia takes community health service as the basis for maternal and child healthcare. The talent cultivation in Australia is also divided into general practitioners and specialist physicians.

The maternal and child healthcare in Sweden (Qiu, Li, & Ding, 2008) is well-developed, and services such as maternal health and childbirth are provided free of charge by the government. The Swedish maternal and child healthcare institutions include basic medical service institutions and provincial and municipal hospitals. Swedish maternal and child healthcare is characterized by "focus sinking" to the community and great importance is attached to maternity assistant education. In Sweden, the healthcare services for normal pregnant women are done by the maternity assistant and the prenatal and postpartum care except for childbirth is completed in the community.

1.1.2 Great adjustment of China's health strategy in the new era

Despite the great development of China's maternal and child healthcare over the past 70 years, its maternal and child healthcare hospitals are still facing the test of the times. With the deepening of the medical and health system reform and the advancement of the Healthy China initiative, the era has proposed new requirements for maternal and child healthcare in China.

1.1.2.1 Medical system reform in China

Medical and health system reform (hereinafter referred to as medical reform). The medical reform is a long-term, arduous and complicated systematic project. Since the founding of People's Republic of China in 1949, China's medical reform has gone through four major stages. **The first stage is from 1949 to 1984, which is the initial stage of medical system establishment.** In this stage, China mainly learned from the national free medical system of the former Soviet Union. All medical institutions are operated by the government, and the employees are staff of government affiliated institutions. There are also "barefoot doctors" unique to China providing medical services in the village. **The second stage is from 1984 to 2002, which is the initial exploration stage of medical reform.** Following the transformation of China's planned economy system to the market economy system, the Chinese government has delegated power to medical institutions and expanded hospital autonomy. At this stage, the proportion of Chinese government's health investment was declining year by year. Market-oriented medical reform has led to the continuous pursuit of interests by large public medical institutions. At this stage, most Chinese people did not have medical insurance. Urban residents medical insurance coverage was only 49%, and rural residents medical insurance coverage was only 7% (Meng et al., 2019). Social contradictions such as "difficult access to medical services and expensive medical bills" are prominent. **The third stage is from 2003 to 2008, which is the continuously deepening stage of medical reform.** The Chinese government increased investment in public health, established a basic medical insurance system for urban workers in 1998, piloted a new rural cooperative insurance system in 2003, and piloted urban residents' medical insurance system in 2007, which guaranteed the right to health of disadvantaged groups to a certain extent. However, it has not been able to solve the people's livelihood problem of difficult access to medical services. **The fourth stage is from 2009 to the present, which is a new round of deepening of medical reform.** At present, the new medical reform has basically finished the demand-side reform. China has achieved basic medical insurance coverage of 95% of population, established a medical insurance system for major illnesses, invested 965 billion yuan for the construction of primary healthcare institutions, and canceled the essential medicine markup (Meng et al., 2019).

1.1.2.2 Public hospitals in China enter a transformation period

About 60% of China's health resources are concentrated in public hospitals. The key points of public hospital reform in China lie in breaking the profit-seeking mechanism to deepen the reform of medical insurance payment methods, and further promoting the construction of

modern hospital management system to accelerate the construction of hierarchical medical treatment system. The specific reform measures include: **(1) Change the environment:** Encourage the development of private hospitals, realize multi-sited license, establish a regional medical service labor division and cooperation mechanism, and implement hierarchical diagnosis and treatment. **(2) Control costs:** implement zero price difference of drugs, implement clinical pathway, and implement medical insurance payment methods according to diagnosis related groups (DRGs). **(3) Transform management mode:** make innovations to the medical service mode, achieve “three transformations” and “three improvements”, namely **development mode:** gradually develop from focus on scale expansion to quality and efficiency; **management mode:** gradually develop from extensive administrative management to delicacy informatization management; **input direction:** transformation from investing organizational hardware construction to increasing investment in connotation construction; **improvement of efficiency:** improve the overall performance of service system through measures such as vertical resource flow; **improvement of quality:** take clinical pathway management as the starting point and strengthen medical quality management; **improvement of enthusiasm:** effectively mobilize the enthusiasm of medical staff by improving the treatment of medical personnel.

1.1.2.3 Healthy China 2030 strategic planning

In August 2016, General Secretary Xi Jinping pointed out at the China Sanitation and Health Conference that “there is no comprehensive well-off society without universal health”, putting people's health on the priority of development, and proposed a national health industry work policy of “integrating health into all policies (Ma, 2016). Subsequently, China adopted the “Healthy China 2030” Planning Outline (State Council, 2016), which shows the main health goals of Healthy China: the per capita life expectancy: reaching 79 years; the infant mortality rate: not more than 5.0‰; the under-five children mortality rate: not more than 6.0‰; and the maternal mortality: not more than 12.0/100,000.

1.1.3 Problems existing in the development of China's maternal and child healthcare hospitals in the new era

1.1.3.1 Rocketing demands for maternal and child healthcare

With the construction of the medical insurance network, demands for medical and health service have risen rapidly. The biggest achievement of China's medical reform for more than 20 years is that it has formed the world's largest medical insurance network and achieved

universal medical insurance coverage of China's 1.3 billion urban and rural residents, forming a "foundation security network" for the Chinese resident's medical insurance. The public has been freed from the trouble of exorbitant medical expenses, and the demands for medical care by women and children have also increased year by year. Over the past ten years, the number of visits to maternal and child healthcare institutions had increased from 148.47 million person times in 2009 to 283.7-million-person time in 2017, an increase of 91.1%. The number of hospitalized patients had increased from 5.72 million in 2008 to 9.82 million in 2017, up by 71.75% (see Figure j.1).

With the implementation of the "universal two-child" policy, maternal and child healthcare services are facing higher requirements in quantity and quality. 1. More second-child are born and the base of the service population has increased. In 2016, China began to implement the "universal two-child policy". And in the same year, the number of births in China was 17.86 million, which is the highest since 2000. The number of the second child and above was 7.21 million, accounting for 42.6% (Sun, 2017) . In 2017, the number of births in China was 1.723 million, including 8.83 million of second child and above. The two-child and above accounted for 51.2%, which increased by 11.4% compared with that in 2016. Compared with one year earlier, the number of births dropped but it was the second peak since 2000. **2. The number of pregnant women and newborns has increased, and the workload of medical treatment has increased dramatically.** Along with the significant increase in births, there is a growing demand for maternal and child care such as antenatal checkups, childbirth, infant care, and pediatric visits, as well as an increasing ward bed turnover rate. **3. The number of elderly and high-risk pregnant and lying-in women and birth defects has increased, and the technical requirements has increased.** The childbearing needs of the two-child have been released, and the proportion of elderly and high-risk pregnant women is high in the reproductive population is higher. The number of high-risk groups with pregnancy complications and birth defects has increased rapidly, and the demands for high-quality medical treatment such as critical illness rescue is increasing. **4. Health awareness has improved and health needs are diversified.** Those who meet the new birth policy generally have better economic conditions and higher education levels. They pay more attention to postpartum rehabilitation and child healthcare, focus more on psychological and nutritional health issues, and have higher requirements for the convenience, refinement and scientificity of maternal and child medical services.

1.1.3.2 Great imbalance between supply and demand of maternal and child healthcare in China

The government investment is insufficient and the compensation mechanism has not been implemented. The total health expenditure of China accounted for 5.3% of its GDP in 2015, much lower than most high-income countries (Tsinghua University Global Industry Research Institute, 2019). The maternal and child healthcare hospitals (centers) in China are supposed to be full budget appropriation unit, but the reality is not so, and the percentage is only 1/3 of the total income (Gao et al., 2001). According to Chinese policy requirements, the fees for some special examinations and clinical surgical treatment in children's clinical diagnosis should be higher than those of adults (Department of Medical Administration, 2016), but the implementation of compensation policies is not ideal. Take Guangdong Province as an example, by the end of 2018, 13 of the 21 cities in Guangdong Province had not adjusted the treatment fees for children (Du, 2019).

The construction of maternal and child healthcare hospitals is relatively lagging behind. In the process of China's deepening of medical reforms, general hospitals, traditional Chinese medicine hospitals, disease prevention and control institutions, primary healthcare institutions and other medical-related institutions have all received sufficient investment in development, but the construction of maternal and child healthcare institutions has been lagging behind. Over the past ten years, the growth rate of China's maternal and child healthcare institutions have been only 1.9%, but the volume of medical treatment in maternal and child healthcare hospitals has almost doubled. The growth rate of general hospitals is 41.6%, and the growth rate of private hospital institutions is as high as 200.6% (National Bureau of Statistics, 2009-2018).

Core medical resources are seriously inadequate. From 2003 to 2017, the total volume of patients in China has nearly tripled, and the volume of inpatients has increased by 4.5 times. However, the number of practicing doctors in China has only increased by 80%, reflecting the severe discrepancy between the supply of core medical resources and the growth of demands in China (see Figure 1.2). Chinese pediatricians and midwives have been in short supply for a long time, facing problems of difficulty in recruitment and frequent turnover (Liu, Zhao, & Zhang, 2017). From 2011 to 2014, the number of brain drain of Chinese pediatricians was as high as 14,310 (Du, 2019). The 2014 data revealed that there was a shortage of about 200,000 midwives in China (Wang, 2014).

The internal management of the hospital is lagging behind. The current internal

management of China's maternal and child healthcare hospitals cannot adapt to the rapid growth of maternal and child healthcare needs, and it is mainly reflected in four aspects. First, the internal medical resources of China's maternal and child healthcare institutions have unreasonable allocation structure, the operational efficiency is not fully utilized, and the value of core medical resources is not reflected. Second, in the face of changing and developing medical and health care needs in the new era, administrators of maternal and child healthcare hospitals lack preparation and are difficult to adapt to the situation. Third, the service model is outdated, and the operation of maternal and child healthcare institutions has not changed in time to prevention, health and other requirements of the new era. Moreover, the misunderstandings of clinical-oriented management still exist in the daily work (Zhu et al., 2014). Fourth, the overall informationization development of the maternal and child healthcare hospitals is backward. Even in a few advanced areas where the informationization has been implemented, there still lacks normative guidance of national standards (Pang, 2010).

1.1.3.3 Fierce competition brought by rapid growth of private hospitals

In 2000, China officially opened up the medical market, allowing foreign investors to set up private medical institutions in China. Private hospitals were developing rapidly. In 2015, the number of private hospitals in China exceeded public hospitals for the first time. By the end of 2018, there were more than 20,000 private hospitals in China, accounting for 64% of the total number of hospitals across China. Among private specialized hospitals, the number of obstetrics and gynecology hospitals is the largest. The number of private obstetrics and gynaecology medical institutions in China increased from 262 in 2009 to 690 in 2016 (Chen, 2018). After the survival of the fittest in the market competition, China's private maternity hospitals have positioned themselves to offer mid-to-high-end services, focusing on service quality, advanced management philosophy, and superior medical environment. They are strong competitors of public maternal and child healthcare institutions.

1.1.4 Future development trend of maternal and child healthcare in China

Although China's maternal and child healthcare industry has achieved positive results and progress, the development of the maternal and child healthcare hospitals is still relatively slow. In the face of the opportunities and challenges of the new era, the maternal and child healthcare hospitals should follow the reform orientation of the medical and health system, be brave enough to meet the opportunities and challenges of "universal two-child" policy, keep up with innovations of the new policies, new systems, and new technologies, grasp the new demands

of customers, and make new changes in service carriers, service models and development positioning.

1.1.4.1 New demands of maternal and child healthcare customers

As China enters the ranks of middle-income countries, the proportion of the emerging middle class is gradually increasing. It is estimated by experts that the consumption of middle-class and wealthy urban households in China accounts for 55% of urban private consumption in 2020, contributing up to 81% of consumption growth (Gao et al., 2015). The proportion of service-based consumption such as healthcare to overall consumption is rising (Li, 2017). With the improvement of the economic level of major consumer groups, consumer demand will also be more diversified, hierarchical and dynamic. In the new wave of health demands, how can China's maternal and child healthcare hospitals meet the following two demands of customers is key to grasping the opportunities of the times.

First, the demands for mid-to-high end medical services. In response to the consumption characteristics and service demands of the middle class, high-end medical facilities, good medical experience, personalized treatment services and top medical technology have become the most direct demands of healthcare customers under the new normal. **The second are demands for health management.** In the next decade, the medical model will gradually shift to active medicine. The comprehensive and active "4P (predictive, preemptive, personalized, participatory) health management is becoming a lifestyle advocated by the middle class.

1.1.4.2 New carrier of maternal and healthcare technology and service

The particularity of the service customers of maternal and child healthcare hospitals determines the importance of medical efficiency. Medical information, smart medical care, telemedicine and other products or services that improve the efficiency of medical treatment have become products that consumers urgently need. New technological innovations, such as surgical robots, intelligent auxiliary equipment, and 3D printing of organs can make the medical diagnosis process more minimally invasive and precise. Gene sequencing and stem cells bring new methods of diagnosis and treatment, which can improve the screening rate of diagnosis and treatment rate of common diseases of women, providing consumers with a better medical experience and protection.

With the advancement of clinical big data mining technology and the improvement of artificial intelligence technology in the medical field, medical artificial intelligence has been gradually penetrated into health management, which achieves significant results in improving healthcare efficiency by easing the pressure of medical resource shortage and simplifying the

traditional mode of medical treatment. The development of medical science and technology is the trend of the times. Strengthening the development of science and technology is the only way for the maternal and child healthcare hospitals to improve efficiency, and it will inevitably lead to great changes in their development orientation and service model.

1.1.4.3 New positioning of maternal and child healthcare hospitals in China

The new positioning of China's maternal and child healthcare institutions in the new era is mainly manifested in the "combination of healthcare and clinical treatment". The focus of maternal and child healthcare institutions should be centered on the healthcare business of pregnant women, women and children (Zhu et al., 2014). The new positioning of maternal and child healthcare institutions in the new era mainly includes four aspects. First, they are centered on the health of women and children, promoting the transformation from the traditional "disease treatment centered" to "people's health centered". The second is to give full play to the government's leading role, mobilize the linkage of China's three-level medical service network, establish a collaborative mechanism to link the high and low level of medical institutions, and improve the efficiency of medical resource utilization. The third is to focus on prevention, combine prevention and treatment, and adhere to the path of healthy development of women and children with Chinese characteristics. The fourth is to improve the overall health of women and children as the core, and promote medical and healthcare services throughout the reproductive process.

1.1.4.4 New model of maternal and child healthcare service

With the development of the modern bio-psycho-social medical model, medical development is becoming increasingly integrated (Du, 2009). Traditional China's maternal and child healthcare service models often have the following problems. 1. Attach importance to medical treatment and neglect prevention; 2. Separation of prevention and treatment; 3. Non-continuous services; 4. Disconnected mechanisms. The integrated medical and health service model integrates medical treatment, prevention, healthcare and rehabilitation, and breaks down the fragmented diagnosis and treatment of taking stopgap measures, providing patients with continuous and diverse health services (Wu & Li, 2010).

The all-round full-cycle health service model is an important practice of the integrated health service model in China's maternal and child healthcare industry. In August 2016, General Secretary Xi Jinping emphasized at the China Health and Wellness Conference that with improvement of the health of women and children as the core, we should offer full-cycle and all-round services for women and children (Ma, 2016). Full life cycle health management

refers to the process of managing outstanding health issues across the life cycle of a person, including pre-marital, pre-pregnancy, pregnancy, childbirth, postpartum, neonatal, infancy, child and adolescence, adulthood and older age. The closed-loop management of maternal and child healthcare under the whole life cycle is a closed-loop healthcare model that integrates women healthcare, perinatal healthcare, and child healthcare with women and children as the focus of health management (see Figure j.2).

1.2 Research questions

The demands for maternal and child healthcare in China are rising rapidly. The quantity and quality requirements are constantly rising, presenting diversified and dynamic features. Originated from the planned economic system, China's maternal and child medical security system cannot adapt to the new pattern of changing demands both in the total amount or structure. In the face of such a situation, how will the China's maternal and child healthcare hospitals develop? What strategies to improve core competitiveness of maternal and childcare hospital in China, so that the hospital can find a breakthrough in the specialized medical market where resources are limited and the supply and demand relationship is seriously unbalanced, and embark on a road of sustainable development with distinctive features.

In order to develop a feasible development strategy for SD Maternal and Child Healthcare Hospital, what we need to study further is: What is the core competitiveness of medical institutions? How is the core competitiveness of maternal and child healthcare hospitals defined? How to cultivate the core competitiveness of maternal and child healthcare hospitals? What is the important role of enhancing the core competitiveness of maternal and child healthcare hospitals in an environment of reform? In response to these problems, this thesis conducts an in-depth study on SD Maternal and Child Healthcare Hospital.

1.3 Research significance

1.3.1 Theoretical significance

Practice has proved that formulation of development strategy is a good path for enterprises to enhance their competitiveness (Song, 2015; Hou, 2016), but the theoretical research on enhancement of core competitiveness of China's maternal and child healthcare hospitals is extremely insufficient (Wang, 2016). This study “~ November 13, 2018”, as the date of retrieval,

the search field “keywords”, and the search term "core competitiveness of the hospital”, based on the search database of “CNKI”, received 3757 references, to join the search word get with 182 references, after the “evaluation system”, “keywords” for retrieval fields, and the search term “core competence” “Maternal and Child healthcare Hospital”, received 22 references, considering the literature is less, use nearly righteousness retrieval word “core competence” “Maternal and Child healthcare Hospital” with 242 references after retrieval, to join the search term “evaluation system” after only 11 references. Based on the literature analysis results that, compared with general hospitals, there are few studies on the core competitiveness and evaluation system of Maternal and Child healthcare Hospitals in China. With the further development of China's new medical reform, comprehensive implementation of the Healthy China strategy, and the increasingly prominent effect of the “two-child” policy, the operation and management model of China's maternal and child healthcare institutions will inevitably change, and there will undoubtedly be many new challenges to maternal and child healthcare institutions. Therefore, it is of great significance to analyze the development status and existing problems of China's maternal and child healthcare hospitals and develop a targeted development strategy for maternal and child healthcare institutions to enhance their core competitiveness through empirical research.

1.3.2 Practical significance

This thesis selects the SD Maternal and Child Healthcare Hospital, a third-grade class-A maternal and child healthcare institution in the Pearl River Delta of China as the empirical research case. The research on enhancing the core competitiveness strategy will help break the development bottleneck of SD Maternal and Child Healthcare Hospital, summarize the development shackles, and provide scientific and feasible guidance for the long-term development, which has far-reaching significance for the sustainable development of the institutions. The core competitiveness enhancement strategy for maternal and child healthcare institutions formed in this thesis is based on China's national conditions and can provide experience for other maternal and child healthcare institutions.

1.3.3 Innovations

1. This research is guided by China's latest policies and closely follows the new development trend of China's medical and health development. It is an active exploration of the maternal and child healthcare industry in China in the new era;

2. This thesis takes the China's maternal and child healthcare hospitals as the research objects to carry out strategic research on enhancement of core competitiveness. The domestic maternal and child healthcare institutions are troubled with low vitality of theoretical research and lack of guidance in practical research. This research helps to fill the gap in the domestic research on maternal and child healthcare development strategies.

3. The empirical research and the scientificity and feasibility of the constructed index system and model are expected to provide references for the sample hospital and other hospitals of the same type to build and enhance their core competitiveness.

1.4 Thesis structure

Centering on the core competitiveness of maternal and child healthcare hospitals, we constructed an evaluation index system of core competitiveness of maternal and child healthcare hospitals through literature review, free listing and other methods. Based on SD Maternal and Child Healthcare Hospital, we used SWOT method, PESTEL method and other methods to analyze the internal and external environment and competition strategy selection of the hospital. On this basis, we proposed specified competition strategies, implementation plans and safeguard measures of the strategies for the hospitals, hoping to realize hospitals' sustainable and healthy development by improving the core competitiveness of maternal and child healthcare hospitals in China at the new era.

The structure of this thesis includes title, abstract, key words, contents, main body (including six parts), bibliography and appendix.

Chapter 1 is introduction: by analyzing the status quo of China's maternal and child healthcare system, major adjustment of China's health strategies at the new era, and problems in the development of maternal and child healthcare hospitals in the country, this chapter proposes the research significance, research framework and technology road-map of this research.

Chapter 2 is literature review related to organizational strategy and core competitiveness: Based on existing open data, this chapter studies the research developments, composition factors, and cultivating methods of domestic and overseas core competitiveness from the perspectives of organizational strategy, competitive advantages, resource, organizational capabilities, dynamic capabilities, culture, core competitiveness and hospital core competitiveness, hoping to provide reference for strategy research of core competitiveness of maternal and child healthcare hospitals, which is in lack of theoretical research.

Chapter 3 is research methods: This chapter explains the ways and means of data collection, ways and direction of data analysis and makes clear the ways and structure of the research.

Chapter 4 defines the core competitiveness of China's maternal and child healthcare hospitals and constructs an evaluation index system: through Delphi method, this chapter selects the evaluation indexes of core competitiveness of maternal and child healthcare hospitals in China, determines their weight coefficient and assignment plan, and constructs a comprehensive evaluation model of core competitiveness of maternal and child healthcare hospitals in the country. It also verifies the effectiveness and scientificity of the model through TOPSIS method, 2018 national performance ranking and other correlation analysis.

Chapter 5 is case study: through overall analysis of status quo, internal and external situations, and development process in the past decade of SD Maternal and Child Healthcare Hospital, this chapter comes up with plans and safeguard measures for the formulation and implementation of the hospital's strategies, offering reference for the strategy research of other hospitals at the same level. Taking the SD Maternal and Child Healthcare Hospital as a case and through SWOT analysis, questionnaire surveys of customers and staff, round-table conferences, and files of the Hospital over the past decade, a specialized strategic plan and implementation strategy have been proposed to comprehensively improve the core competitiveness of maternal and child healthcare hospitals. To this end, the strategy to improve these hospitals' core competitiveness of can be clearly defined, and it can be clarified how the core competitiveness helps these hospitals obtain a sustained competitive advantage.

Chapter 6 is conclusion: this chapter summarizes solutions and effects of the research problems and reviews the limitations and contributions of this research to provide reference for the researches of the same kind.

1.5 Research framework and technology road-map

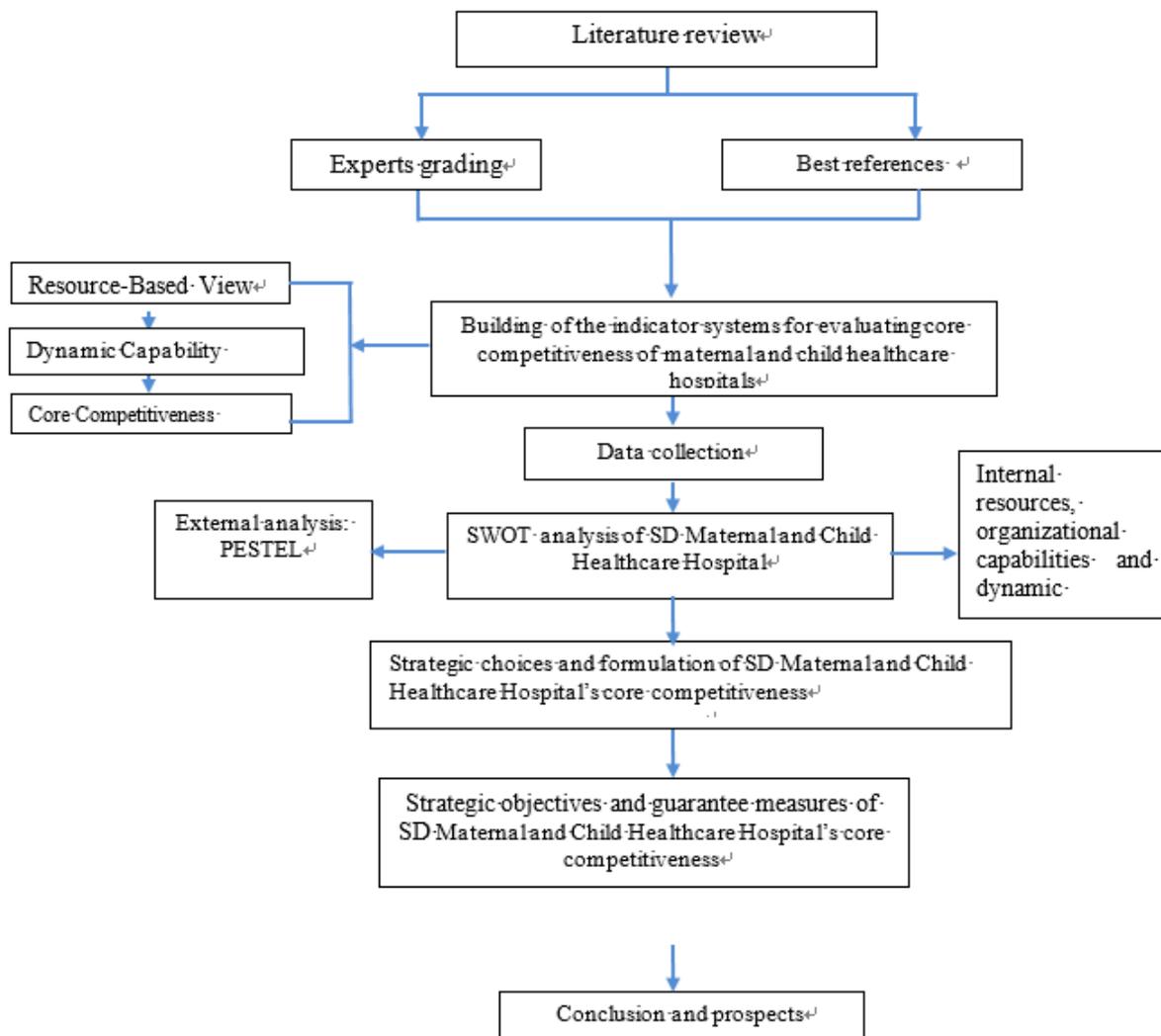


Figure 1.1 Research framework

[This page is deliberately left blank.]

Chapter 2: Literature review

2.1 Organizational strategy and competitive advantage

Strategy, a word originated in the military, refers to a set of tactics to defeat the enemy in a battle. Against the backdrop of industrial revolution and economic development, strategic management theories have been developed from the enterprise management practice by scholars from Europe, the United States and other countries. Those theories have now evolved into a whole management system and become a significant theoretical branch in management. The new definition of modern strategy can be explained in the book *Strategic Management* by Hitt (2017): that is, strategy is a series of agreements and actions used to develop a company's core competitiveness and gain competitive advantages.

2.1.1 Evolution of organizational strategy

The concept of organizational strategy gradually took shape during the industrial revolution and economic development. In 1938, Barnard (1938) first introduced the idea of strategic organizational management in his book *The Functions of the Executive* and used this idea to analyze the various factors in an organization and the interrelationship among them.

After World War II, the United States enjoyed unprecedented economic prosperity and witnessed an increasingly competitive market, which has brought a great impact on enterprise development. In 1962, Chandler (1962) demonstrated the relationship among organization, strategy and environment in his book *Strategy and Structure: Chapters in the History of the American Industrial Enterprise*. He further put forward the theory of structure follows strategy, which proposes that corporate strategy should be adapted to the changes of the environment and organizational structure should be accommodated to the requirements of corporate strategy.

In 1979, Ansoff (1979) published *The Concept of Strategic Management*, in which he introduced the concept of "strategic management". In his masterpiece *Strategic Management*, he elaborated on the formation and development of strategic management theory, defining strategic behavior as the result of continuous internal structuring of enterprises in the process of adapting to the environment.

With the great changes in the world political and economic landscape in the 1980s, the focus of strategic management theory has gradually been shifted towards how to understand and gain the competitive advantages of organizations. The management theory related to competitive advantage has become a popular field of strategic research for a long time (Rumelt & Teece, 1994).

Based on the development process of organizational management, there are 10 schools of the theory of organizational management (Mintzberg, Ahlstrand, & Lampel, 1998):

Design School: In 1957, Selznick (1957) published *Leadership in Administration*, and in 1962, Chandler (1962) published *Strategy and Structure*, marking the origin of the design school.

Planning School: Ansoff's *Corporate Strategy* (1965) is the most influential representative work of this school.

Positioning School: Porter's *Competitive Strategy* (1980) makes Positioning School a leading school in strategic management. This school leans to study external environment, particularly from industries and competitors, but neglects the function of corporate internal capability.

Entrepreneurial School: In 1934, Schumpeter (1934) proposed that the factors that are closely related to enterprise behavior are not to maximize profits, but the various strategic intents adopted by enterprises in dealing with different changing environments, and the production combination methods of entrepreneurs.,

Cognitive School: Simon (1947, 1958) believed that the analysis process trying to make decision making more reasonable is unreasonable itself.

Learning School: In 1980, Quinn (1980) published *Strategic Change: Logical Incrementalism*, marking the representative work of the rise of Learning School. Subsequently, Prahalad and Hamel (1990, 1993, 1994) published books such as *Core Competence of the Corporation*, *Strategy as Stretch and Leverage*, and *Competing for the Future* in succession, proposing that strategy depends on learning and learning depends on capability. Their dynamic capability highlights that capability is built through strategic learning.

Power School: In 1978, MacMillan's *Strategy Formulation: Political Concepts* (1978) is the representative works of the Power School.

Cultural School: In 1984, Wernerfelt published *Theory of Resource Management* (1984), stressing capability's root in the process of organizational evolution, that is, culture. In 1986, in his article titled *Organizational Culture: Can It Be a Source of Sustained Competitive Advantage?*, Barney (1986) suggested that culture should be viewed as the most effective and

strongest fortress against imitation. Both Resource-Based View and Dynamic Capabilities Perspective are closely related to the maintenance and development of corporate internal capability and they are “internal-to-external views”.

Environmental School: In 1977, population ecologist Hannan and Freeman (1977) put forward that organizations have right to make selection, which in most case is casual, and are able to construct most of their own environment so as to adapt themselves to the environment as much as possible or to store specific resources for future use.

Configuration School: In 1962, Chandler (1962) published a groundbreaking book titled *Strategy and Structure: Chapters in the History of the Industrial Enterprise*, proposing the time-specific theory of strategy and structure and the strategic pioneer structure.

Based on the above-mentioned development and evolution of strategic management, scholars have formed a round-trip process in exploring the source of competitive advantage of enterprises, starting from the outside to the inside and turning from the inside to the outside. The main representatives are Industrial Organization Theory and Resource-Based View (RBV) (See Figure 2.1).

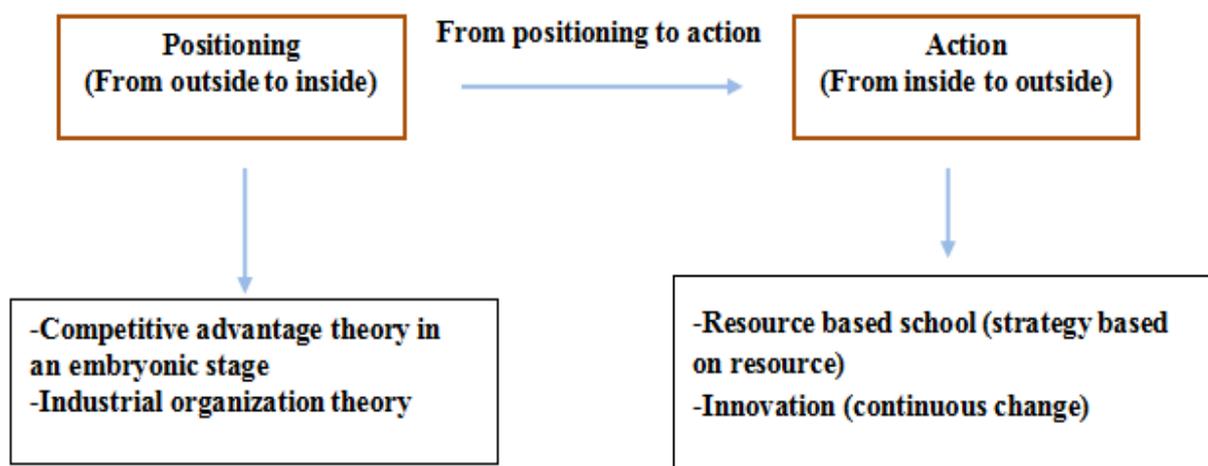


Figure 2.1 Source evolution of enterprise competitive advantage

Source: (Cardea & António, 2012)

2.1.1.1 External market-oriented competitive strategic management theory

In the early 1980s, entrepreneurs increasingly realized that the influence of market structure and strategic factors on corporate profit was greater than that of external economy and political environment and that industrial selection and market positioning should become a core issue in corporate strategy. Economic scholars also began to study strategic management theories, gradually forming a competitive strategy management school based on the structure of industrial competition, guided by the external market environment.

Positioning School: In 1980, Porter (1980) published *Competitive Strategy*, in which he emphasized the influence of industry structure on obtaining competitive advantages and improving market position more effectively, and proposed the Five Forces Model to analyze corporation's industrial structure and the industry's competition strength. He is a representative expert of the positioning school.

Positioning School took the lead in adjusting the focus of strategic analysis to the industry, paying attention to the impact of the external environment, and building a series of analysis tools to assist strategic selection, so as to guide the effective operation of the enterprise.

However, these analysis methods caused dissatisfaction of other strategy researchers because the analysis focused on external environment and neglected internal environment and conditions. Scholars gradually realized that corporation's most important profit source should be its special nature, instead of inter-industry interactions. Many industrial phenomena are difficult to be explained by the theory of Industrial Organizational School.

2.1.1.2 Strategic management theory dominated by corporation's internal resources and capabilities

As the limitations of the theory and strategic analysis methods of Industrial Structure School became increasingly obvious in practice, scholars began to make a clearer definition of strategy-related concepts and tried to analyze corporation's sustained competitive advantages from a new perspective. Therefore, corporation's internal resources and capabilities dominated the research of strategic management theory.

Behavioral School (Resource School): In the mid-1980s, Wernerfelt proposed that the source of corporation's competitive advantages was a strategic resource controlled by the corporation. The strategic resources owned or accumulated by each enterprise are different and the key resources can help the corporation to win competitive advantages. The resources are permanent and irreproducible and cannot be purchased between corporations and therefore the competitive advantages are sustainable.

In 1990, Prahalad and Hamel (1990) proposed that the real source of competitive advantages was management staff's capability to adapt technology and production skills quickly to change and capture opportunities. On this basis, they proposed the Capability-based Theory and integrated core capability and strategic management into a new capability-based competition model.

In 1998, Barney (1998) further developed the resource strategy view and affirmed that special resources of corporations were the basis for their lasting competitive advantages.

Resource School proposed that for every corporation the combination of special resources and capabilities was the basis of strategies. The resources, capabilities, and differences in the use of these resources and capabilities of a corporation are its competitive advantages. The core of this strategy theory lies in that the major goal of corporate strategic management is to cultivate the corporation's capability to use the special strategic resources and the core capabilities.

2.1.2 Competitive advantage

Competitive advantage refers to an attribute that is superior to the counterparts. It is manifested in that the organizational structure of the corporation is superior to that of competitors, and it can better meet the needs of customers (Xiang, 2007; Barney, 2015).

Competitive advantage is still ill-defined for now, but it can be explained from two aspects: First, it is an advantage in market share, which means that an organization outperforms its competitors in both number of customers and market share of market-oriented products; second, it is an advantage in resource utilization rate or organizational performance. That is to say, the efficiency and performance management of an organization are better than that of the rivals (Peteraf, 1993; Schulte, 1999).

In 1980, Michael Porter proposed in his book *Competitive Strategy* that the industrial structure of an organization determines its scope of competition and how it can gain competitive advantages. Furthermore, he adopted his Five Forces Model to analyze the industrial structure and competitive strength of enterprises (Porter, 1980). However, the focus of industrial organization theory on the analysis of the external environment resulted in its limitations in explaining industrial phenomena. Therefore, the resources and capabilities of enterprises themselves have become main research objects in the theory of competitive advantage.

In 1984, Wernerfelt proposed in his representative work *A Resource-Based View of the Firm* that the strategic resources owned by enterprises are the source of competitive advantages (Wernerfelt, 1984). In 1991, Barney developed the concept of resource strategy into an integrated theory. He put forward that unique resources can be the basis of sustained competitive advantage for enterprises (Barney, 1991).

In 1990, Prahalad and Hamel put forward an important theoretical branch of resource-based theory—core competitiveness theory in their article *The Core Competence of the Corporation*. He constructed a competency-based competitive strategy framework that combines core competence with strategic management (Prahalad & Hamel, 1990).

In 1994, Raffa and Zollo (1994) proposed that culture is embedded in the organization. It is an organic combination of core competence in terms of technology, organization, and culture. They are the representatives of culture-based competition theory.

The source of competitive advantage is a combination of different factors and now there is still no widely-accepted analytical framework in the academic communities (Chen, 2009). The author, based on the research theories of many scholars, explores the source of competitive advantage of hospitals from the perspectives of resources, capacity and culture.

2.1.3 Differences between hospital development strategy and enterprise development strategy

Hospital development strategy and competitive advantage are emerging topics when it comes to hospital management research. Organizational strategy and competitive advantage theory serve as significant references for current hospital-related theoretical research. The characteristics of the medical market determine that there are certain differences between the hospital development strategy and organizational strategy.

2.1.3.1 Characteristics of medical market

Under the leadership of the government, the medical market is formed in the process that medical institutions (mainly hospitals, including maternal and child healthcare hospitals) provide alternative medical services to the demanders on the premise of completing the social public health tasks, and the medical market also is the sum of the factors related to this process (Guo, 2006).

Based on the particularity of medical service, the main characteristics of the medical market different from the commercial market are as follows (Guo, 2006).

1) Public welfare-oriented: Medical services are social welfare to a certain extent, which is manifested that medical market is public welfare-oriented. On the one hand, medical services need to obey the exchange relationship between supply and demand. On the other hand, it also contains a humanitarian service relationship to save lives and help the injured.

2) In a complicated supply-demand relationship: The supply and demand of medical treatment includes the unique emotional exchange relationship between doctors and patients as well as the exchange of medical technology and costs.

3) Constrained by multiple factors: The medical market is strictly regulated by market norms, laws and regulations as well as service quality. At the same time, it is also subject to administrative intervention, including resource allocation and price leverage. Therefore, it can

be seen that there is a multi-level and multi-faceted restriction system on the medical market.

4) Limited and monopolistic in a region: The scope of medical services limits the geographical reach of hospitals' services, and the few hospitals in the region have the potential to monopolize the local medical market

5) Irreplaceable in terms of service quality: For serious diseases and high-tech medical services, although exchange is possible through further training and study, medical institutions of different levels can provide poor substitutability of medical service quality due to their differences in proficiency.

2.1.3.2 Status quo of research on Chinese hospitals' development strategies

In order to learn about China's medical institutions' research developments in strategic management theory, we retrieved 1,114 references on the search database of "CNKI", with "~November 18, 2018" as the date of retrieval, "keywords" as the search field, and "strategic management" and "hospital" as the search terms. As there is much interference, we used "strategic management theory" and "hospital" as the search terms, retrieving 215 references. After duplicate checking, selection and intensive reading, we collated the evaluation dimensions and research methods related to hospital strategic management.

Through literature review, most of the theoretical research on hospital strategic management are based on PEST analysis, Michael Porter's Five Forces Model or SWOT analysis methods. After analyzing the macro environment, medical institutions' own advantages, disadvantages, opportunities and threat are discussed, and corresponding strategies are proposed on this basis. In general, the researches on Chinese hospitals' development strategies are lagging in the application of theoretical systems and lay emphasis on transplanting of pragmatical organizational strategic research methods but lack innovation in theoretical systems with the characteristics of medical institutions.

2.2 Resource-based view (RBV)

Resource-Based View (RBV) refers to the use of resources to maintain the growth strategy and competitive advantage of enterprises (Wernerfelt, 1984). The basic idea behind it is: as an aggregate of various resources, an enterprise needs to create and accumulate resources to gain its competitive advantages and formulate its own development strategies based on resource positioning. Only when resources conform to VRIN (later developed into VRIO) can the idea become the basis for creating competitive advantages (Barney, 1991).

The thinking logic of RBV is from internal aspect to the external one, focusing on the corporation's internal organizations and considering that internal resources are more decisive than external environment factors. RBV lays emphasis on the strategic complementarity in attaining competitive advantages, and on the fact that the ownership of strategic assets is the determining factor of competitive advantages in organizational structure (Amit & Schoemaker, 1993). Specifically, strategic assets refer to assets that can bring long-term competitive advantages to enterprises, which are difficult to be imitated or replaced. They are non-tradable, accumulating in a slow way and meeting the market demand (Barney, 1994). Enterprises can attain sustainable competitive advantages by implementing value-creation strategies. Such competitive advantages cannot be easily imitated by rivals. Eventually, when these resources are complementary to their related activity systems, their potential to create sustainable competitive advantages can be improved.

2.2.1 Resource

The essence of the RBV is to regard the enterprise as a unit for analysis. RBV focuses on analyzing various resources owned by the enterprise and takes the internal enterprise resources as the analytical basis. It enhances the competitive advantage of the enterprise to obtain excess profits through exploiting its unique resources and specific capacities (Wang, 2007).

According to the RBV, resources refer to the collection of all assets that an enterprise can control and utilize to achieve its goals. Furthermore, resources can be classified in numerous ways as RBV developed over time. Defined by Wernerfelt, enterprise resources are "those (tangible and intangible) assets which are tied semi-permanently to the firm" (Wernerfelt, 1984). Following Wernerfelt, Grant further classified resources into six categories: material resources, wealth resources, technical resources, human resources, organizational resources and reputation (Grant, 1991). Experts and scholars of resource theory do not come to an agreement on the classification of resources. Grant (1991) divided resources into three types of tangible resources, intangible resources and human resources. Tangible resources refer to the visible and quantifiable resources, generally including financial resources and material resources; intangible resources refer to resources accumulated for a long time and obtained in the development process of enterprises, mainly including technology, commercial reputation and skills (Quan, 2008; Zhang, 2017). Human resources refer to the work experience, professional knowledge, discrimination, risk-bearing tendency and personal wisdom related to the enterprise. Grant (1991) held that for enterprises, intangible resources and assets are the most valuable, and also the most strategically-paramount.

2.2.2 Organizational capabilities (ordinary capabilities)

Prahalad and Hamel put forward the Core Competence Theory in the 1990s. They believed that capabilities behind the tangible and intangible resources of an enterprise are the essence of corporate vitality and the source of the enterprise's competitiveness (Hamel, 2000). With obvious path dependence, an enterprise's capabilities are the result of its long-term learning and accumulation, which are closely relevant to the initial element capital input, additional element capital input, and the enterprise's experience. Enterprises' capabilities exist in staff's physical quality, strategic development planning, institutional industry standards, and overall cultural atmosphere of learning. Because of path dependence and the capabilities in the enterprise as a whole, any part of the enterprise will no longer have the original capabilities in the full sense after being separated from the enterprise. In this regard, the enterprise is a unique combination of working capabilities.

The Capability Theory was put forward from the perspective of enterprise's capabilities, holding that organization's capabilities are the source of enterprises' competitiveness. However, this Theory fails to offer a more specific definition of capability, and it overemphasizes the role of technology, and the core competence as a fundamental development strategy. Therefore, it neglects the pivotal role of outstanding person, market operation and other functional strategies but only analyzes competitive advantages from the internal source of enterprise's competitiveness, thus ignoring the possibility of external sources of enterprise competitiveness. (See Figure 2.2).

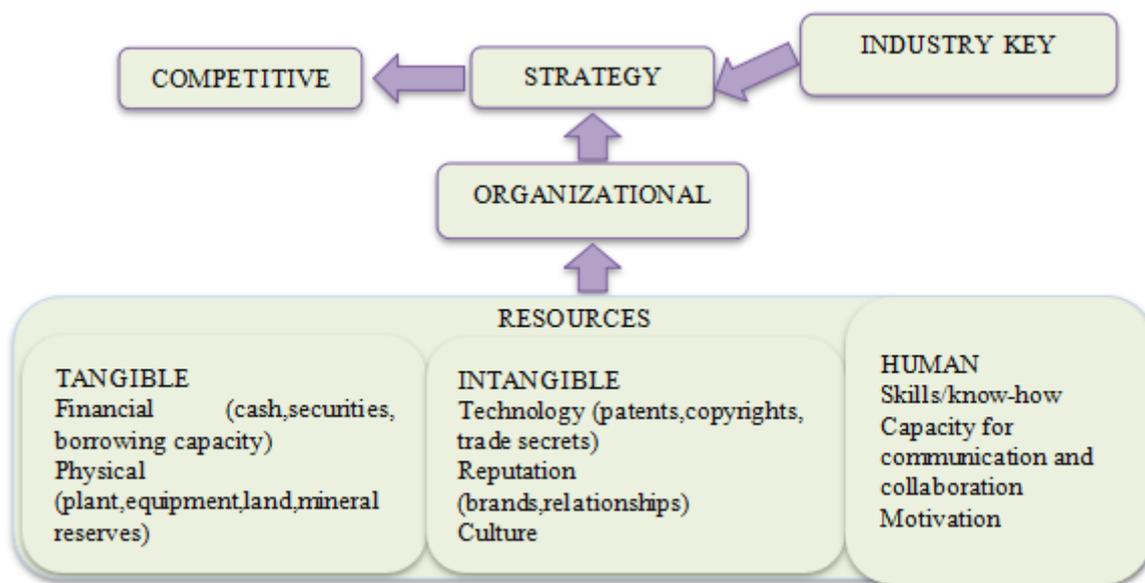


Figure 2.2 Competitive advantage strategies in RBV

Source: Base View (RBV) of Strategy (Grant, 1991)

2.2.3 Hospital resources and organizational capabilities

2.2.3.1 Hospital resources

Hospital resources refer to all kinds of tangible and intangible investment made by hospitals in order for them to engage in medical activities. According to resource classification, these resources can be divided into three categories: tangible resources, intangible resources and human resources (Quan, 2008). These three kinds of resources may not only cover traditional medical resources (such as medical technicians and medical technology), but also include those once considered as non-medical resources (such as internet and operation mode) (Chen et al., 2017).

(1) Tangible resources. Tangible resources of a hospital refer to the collection of human resources, physical assets and liquid financial assets that are suitable for medical activities (Quan, 2008). These three types of resources are regarded as tangible because their value can be assessed in the human resources report and financial report of the hospital. Generally speaking, the value of tangible resources is limited. Hospital may find it difficult to extract additional value from them. However, human resources are special since they serve both as tangible resources and carriers of intangible resources. Specifically, doctors, nurses, and administrators in medical institutions are the main body of hospital productivity and the creator of hospital wealth. Undoubtedly, the quality of human resources plays a decisive role in the operation of a hospital (Richard & Provo, 2000).

(2) Intangible resources. Hospital intangible resources refer to the history of the hospital and the long-term accumulated property. These resources are unique and therefore not easily accessed and imitated by rivals (Quan, 2008). The professional knowledge, technology, information, well-known brands of the hospital, medical ethics assessment, intellectual property, and copyright of medical personnel in the hospital are all intangible resources. In terms of hospital financial statements, most intangible resources cannot be quantified and displayed. They will not be easily consumed during use and even come into gradual increase if properly used over time. Being difficult to be imitated and replaced, intangible resources are more inclined to bring competitive advantages to the hospital.

As an intangible resource, culture generally refers to the total of the organizational specific value concept, basic confidence and code of conduct that are uniquely developed during the organization's survival and development and followed by most organizational members. The culture that has been agreed upon within the organization and is deeply understood and concretely guided by the members of the organization provides the basis for core competencies that cannot be emulated (Raffa & Zollo, 1994). Hospital culture affects many aspects, including hospital development strategies, medical quality, medical technology, hospital rules and regulations, hospital brand image and staff's behaviors (Yang, 2011).

(3) Human resources. Human resources are unique, which are tangible resources and carriers of intangible resources as well. Doctors, nurses and managers in medical institutions are all the entities of hospital productivity and creators of hospital wealth so that the quality of human resources plays a decisive role in hospitals' system operation (Richard, 2000). With the aim of simplifying the first-level indexes, this study classifies human resources as tangible resources (Quan, 2008).

If the resource is more mobile, the competitive advantage gained from that resource is less lasting.

2.2.3.2 Hospital organizational capabilities

Hospital capabilities refer to the abilities that hospital use, transform and integrate resources. It is a complex combination of the input and output processes of assets, personnel, and organizations, which is mainly manifested in the effectiveness and efficiency of integrating the required resources to accomplish diagnosis and treatment tasks or engage in production and business activities (Quan, 2008).

Hospital capabilities refer to the basic ability to provide medical services, including the whole-process output and final results of health services, mainly reflected by radiation capacity,

various technologies, achievements, quantity, and quality of medical services of the hospital (Chen, Min, & Yue, 2017).

Hospital capabilities include direct capabilities (medical services capabilities) and indirect capabilities (operational and managerial capabilities).

2.3 Dynamic Capability Theory

2.3.1 Dynamic capabilities

With the rapid development of global economy and fast reform of technology, how can the corporation adapt to the rapidly changing environment to maintain long-term competitive advantages? As the limitations of RBV static analysis became increasingly obvious, the Dynamic Capability Theory was born to expound the enterprise's capability to update, integrate and re-construct resources (Teece, Pisano, & Shuen, 1997; Eisenhard & Martin, 2000), as well as to explain and guide the enterprise to continuously obtain competitive advantages in the dynamic environment.

Unlike the RBV, Dynamic Capability Theory believes that resources are remarkably different from capabilities. The source of competitive advantages is the environment of dynamic capabilities and it lays more emphasis on capabilities than resources because resources quickly depreciate in the dynamic market (Collis & Montgomery, 2008). Still, resources are important but such importance is based on dynamic capabilities' configuration of resources (Cavusgil, Sergeie, & Talay, 2007; Prieto, Revilla, & Rodríguez-Prado, 2009)..

On one hand, RBV considers that, to win competitive advantages, the enterprise has to possess value, rarity, inimitability and organization (VRIO) resources (Barney & Wright, 1998) and the analysis unit should be resources. On the other hand, Dynamic Capability Theory believes that competitive advantages must source from value, rarity, and inimitability (VRI) (organizational structure is capability) and the theoretical analysis unit is organizational structure (Cardea & António, 2012). Possession of resources and owing of practical resources are equally important and possessing capability makes the integration and utilization of resources possible. As a result, capability may be regarded as the "organizational structure (O)" in "VRIO", that is, the enterprise's way to organize resources (Barney & Wright, 1998; Newbert, 2008).

There is still no consensus on the dimensionality of dynamic capabilities. Teece proposed that dynamic capabilities consist of three dimensions, including the capabilities of integration,

construction and reconstruction (Teece, Pisano, & Shuen, 1997). In his further research, Teece divided dynamic capabilities into three dimensions: The capability to (1) sense and shape opportunities and threats, (2) seize opportunities, and (3) enhance, combine, maintain, and, when necessary, reconfigure the business enterprise's intangible and tangible assets (Teece, 2007). Barreto further classified dynamic capabilities into sensing the trend of opportunities and threats, making timely and market-oriented decisions, and changing the resource base of the enterprise (Barreto, 2010). Generally speaking, dynamic capability can be categorized into three groups based on its dimensions and the timing when it starts to play a part: (1) sensing, which refers to enterprises' ability to perceive the environment. With this capability, enterprises can identify and grasp opportunities to gain competitive advantages, (2) seizing, which refers to enterprises' ability to mobilize resources. With this ability, enterprises are able to grasp opportunities to gain a competitive advantage in the market; (3) transforming, which refers to enterprises' ability to change and innovate. With this ability, enterprises are able to achieve continuous renewal through transformation in order to obtain or even maintain competitive advantages (see Table 2.1).

Table 2.1 Classification of dynamic capabilities

Classification	Specification
Sensing (insight into the environment)	Perceive and create opportunities Exploit capacity to analyze and explore the possibilities of the external environment Conduct mutual learning with customers, organize internal communication feedback, and cross-disciplinary learning
Seizing (allocate and integrate resources)	Capture opportunities Find and seize, mobilize resources to take advantage of opportunities and gain value from them Based on market feedback, make a quick adjustment to product strategy, invest resources and develop new projects
Transforming (make changes for innovation)	Transform to conduct continuous renewal Create an enterprise culture that encourages innovation and tolerates failure. Establish a system to encourage, cultivate and incubate the next generation of innovation.

Source: (Teece, Pisano, & Shuen, 1997; Teece, 2007)

2.3.2 Hospitals' dynamic capabilities

The key of medical institutions' dynamic capabilities lies in that hospitals are able to timely sense the challenges and opportunities in the environment and quickly obtain or create the professional knowledge and resources so as to generate the capacity necessary to respond to public health, integrate into the new competitive market ecology, and drive long-term hospital performance improvements (Zhang & Sun, 2019).

Hospitals' dynamic capabilities can be summarized into the following three aspects:

First, environmental insight capabilities. This mainly reflects the learning and training absorptive capacity, which is the key reflection of dynamic working ability. Hospitals with strong learning and training absorptive capacity have a stronger ability to integrate external information content and convert it into hospital internal professional knowledge. The improvement of hospital competitiveness as well as the learning and training absorptive capacity is inseparable. Only by transforming to a learning organization can it lay a solid foundation for the improvement and expansion of core competence and independent innovation capabilities.

Second, resource allocation and integration capabilities. For the hospitals' existing resource basis, they must be able to bring their advantages into play. They chiefly integrate and reorganize resources via changes in the external environment, encompassing administrative organization, management capabilities, strategic prediction and others.

Third, transformation and innovation capabilities. These capabilities are the accelerator in the utilization of strategic resources and can provide ever-lasting competitive advantages. Hospitals must capitalize upon these innovation capabilities to enable their strategic resources to function as long as possible, and constantly update strategic resources so as to gain sustained competitive advantages.

2.4 Core competitiveness

The core competitiveness theory of enterprises originates from the strategic management theory, economics theory, knowledge economy theory, and innovation theory's exploration on the source and logic of sustainable competitive advantage. In 1990, Harvard Business Review published Prahalad and Hamel's article *Core Competence of The Corporation* (1990), which put forward and clarified the concept of core competitiveness for the first time, and recommended three main tests to identify core competitiveness in a company. The ways are as follows: First, market acceptance: a core competitiveness can provide corresponding access to a wide variety of competitive markets. Second, interest: a core competitiveness should make a significant contribution to the perceivable value of the final product to the customer. Finally, uniqueness: a core competitiveness should be unique and be difficult for competitors to imitate.

The main point of the article is that the core competitiveness of an enterprise is the source of its sustained competitive advantage. This view has been widely recognized in the industry, and the term "core competitiveness" has rapidly spread in the management field, and has

achieved remarkable results (Yang, 2007).

2.4.1 Definition of core competitiveness

The definition of core competitiveness has not yet been unified, and core competitiveness has also been translated into “core competence” or “core expertise”. Different researchers have interpreted the core competitiveness theory of Hamel and Prahalad as different factors such as knowledge, coordination and integration, skills and technical schools (Peteraf, 1993; Christensen, 2002; Pavitt, 2002).

Core competitiveness based on cultural perspective: The representatives of this school are Raffa and Zollo. They believed that core competitiveness exists not only in the enterprise's business operating system, but also in its cultural system, and is rooted in the complex relationships among different people as well as between people and the environment (Raffa & Zollo, 1994).

Core competitiveness based on the perspective of resources: The representative of this school is Oliver. He pointed out the role of resources and capabilities in obtaining market competitive advantages for enterprises, which would be sustainable, scarce, inimitable, essential and non-tradable, and that such resources could constitute core competencies. Enterprises with these unique resources can possess a unique position in the industry, and core competitiveness is the capability of enterprises to obtain and hold these unique resources (Oliver, 1997).

Core competitiveness based on organization: The representative of this school is Coombs. He believed that the core competitiveness of an enterprise includes its key technologies and the organizational ability to combine these technologies effectively. An enterprise's core competitiveness should have both technical and organizational characteristics. It is an organizational capability that includes technical expertise such as enterprise products and processes, as well as the effective configuration of technical expertise (Coombs, 1996).

Core competitiveness based on the perspective of innovation: The representatives of this school are Prahalad and Hamel. They defined core competitiveness as cumulative learning in the organization, especially for the coordination of different production skills and the combination of multiple technical ways. They proposed core competitiveness from the perspective of technology and product innovation, and believed that core competitiveness is a specific expertise that can be established through long-term learning and accumulation (Prahalad & Hamwl, 1990). Mayer and Utterback (1993) divided core competitiveness into four dimensions, namely, product technologies, ability to understand user needs, distribution

channels and manufacturing capabilities.

Core competitiveness based on knowledge view: The representative of this school is Barton. He defined core competitiveness as the knowledge system that brings unique characteristics and competitive advantages to the enterprises and he believed that core competitiveness constitutes the enterprise's competitive advantages and is difficult to be imitated by other corporations as time goes by. The knowledge system covers four aspects: (1) employees' special skills and learning capability; (2) systematic integration of knowledge; (3) complete organizational management system; and (4) common value concept and code of conduct (Barton, 1992).

The core competitiveness theory based on innovation and organization structure tends to attach more importance to the effective allocation of organizational capabilities, and emphasizes the acquisition of competitive advantages through accumulation, coordination, innovation, technology and product innovation, and manufacturing capabilities. It is consistent with the dynamic capability theory proposed by Barney and Newbert, thus can be regarded as a different expression of core competitiveness based on dynamic capabilities (Barney & Wright, 1998; Newbert, 2008).

2.4.2 Characteristics of core competitiveness

There are various viewpoints based on different sources of advantage. All schools believe that core competitiveness is the source of enterprises' competitive advantage, and it is a unique ability that enterprises need to gain through continuous accumulation. Some researchers have also interpreted the characteristics of core competitiveness, and have used it to guide companies to find the core competitiveness.

Barney (1991) summarized the characteristics of core competitiveness in four aspects (see Figure j.3):

(1) **Value:** Core competitiveness can help enterprises create more value or reduce costs, and make them better than competitors.

(2) **Rarity:** If all enterprises have a certain valuable resource, in this regard, this resource cannot constitute a competitive advantage. If only a small number of enterprises have a certain resource which is both valuable and rare, in this regard, this resource may give these enterprises a competitive advantage (Barney & Zajav, 1994).

(3) **Inimitability:** Resources that are easy to be imitated by competitors also tend to lose potential competitive advantages. Tangible resources are easier to imitate, and capabilities based on knowledge, culture, and organization are more difficult to imitate.

(4) Organization: Core competitiveness cannot generate competitive advantage by itself. Only when an enterprise has sufficient organizational capabilities to effectively develop, utilize and manage resources and capacities, can they create competitive advantages.

Barney believed that only by assessing environmental opportunities and threats, and conducting business in an environment with high opportunities and low threats cannot create sustainable competitive advantages. Sustainable competitive advantage depends on unique resources and capabilities which can be used by enterprises in competitive environment. In order to discover these resources and capabilities, managers must seek for valuable and rare resources with high imitation cost within the enterprise, then develop and utilize these resources through their own organizations (Barney, 1991).

Few overseas studies have directly analyzed the components of core competitiveness. Reviewing various scholars' analysis of core competitiveness, we can see that the direct components of core competitiveness mentioned by foreign scholars include: technology (Prahalad & Hamel, 1990; Meyer & Utterback, 1993; Coombs, 1996), skill (Prahalad & Hamel, 1990; Barton, 1992), knowledge (Prahalad & Hamel, 1990; Barton, 1992), resource (Olive, 1997), culture (Raffa & Zollo, 1992), organization and system (Coombs, 1993).

Chinese scholar Deng collected and collated 222 documents about core competences in the Chinese Academic Journals Full-text Database, and divided the 31 constituent components mentioned by domestic research on core competence into two categories: resource and capability (Deng et al., 2003). The two categories are hierarchical: resources are the first-level constituent components, and capabilities are the second-level constituent components, which together form the main body of core competence. The components of core competitiveness are listed in Table 2.2.

Table 2.2 Components of core competitiveness

Number	Components	Frequency	Number	Components	Frequency
Resource					
1	Technology	12	6	Reputation	2
2	Company culture	10	7	Market	1
3	Knowledge	9	8	Equipment	1
4	Personnel	5	9	Intellectual property	1
5	Information	3			
Capability					
1	Coordinating and utilizing resources	10	12	Industrial expansion	3
2	Research and development	10	13	Learning ability	3
3	Creativity	8	14	Comprehensive	2

4	Responsiveness	8	15	service capabilities	2
5	Marketing	7	16	Capital utilization	2
6	Front-line execution	7	17	Insight & foresight	2
7	Transformation	7	18	Absorptive capacity	2
8	Decision making	6	19	Sustainable development	2
9	Management	6	20	Efficient operating	1
10	Organization	6	21	Risk prevention	1
11	Organizational management	6	22	Strategic management	1
				Sharing ability	1

Source: Deng et al. (2003)

Core competitiveness is determined by capabilities and resources, but not all resources and capabilities can form core competitiveness. The elements that constitute core competitiveness are those valuable, rare, difficult to imitate and irreplaceable resources and capabilities (Hitt, 2017). Professor Cardea and António (2012) found through case studies that no capabilities or resources can pass the VRIO test of competitive advantage. The competitive advantage lies in how the enterprise organizes and integrates various resources, which is a valuable capability. The value of this capability is strengthened through the integration with other resources. This capability is called VRI capability. No resource that brings capabilities belongs to VRIO, but the competitive capability belongs to VRI. They proposed that the O in VRIO refers to dynamic capability (DC). The uniqueness of dynamic capability in integration and reconstruction determines that core competitiveness is innovative, dynamic and sustainable.

Chinese scholar Yang (2007) stratified core competitiveness components in his doctoral dissertation: The first layer is the resources, which include tangible and intangible resources. These resources must have the characteristics of core competitiveness, VRIO, if they are to become real components; The second layer is the capabilities. Capabilities cover all aspects of the entire enterprise value chain. For different core capabilities, the components may be different, but their scope of effect is concentrated in dynamic capabilities such as business management and technological innovation; The third layer is the core competence, which is the integration of the resource perspective and competence perspective within the enterprise, and usually reflected in the corporate culture with corporate philosophy and corporate values as the core. Yang (2007) proposed that the surface competitiveness is the first level; the competitiveness of the supporting platform is the second level; and the highest level of competitiveness is the third level.

This study combines the results of literature review at home and abroad, takes VRIO resources in resources, dynamic capabilities in capabilities, and culture as the three major components of core competitiveness, and explores development strategies to enhance core competitiveness on this basis (see Figure j.4).

2.5 Hospital core competitiveness

In 1996, the theory of core competitiveness was studied by the field of economic management in China, and then gradually began to be applied to the practical issues such as operation and development of Chinese enterprises. In 2000, Zhu and Liu (2000) first introduced the theory of core competitiveness to hospital management and proposed that the core competitiveness of medical system mainly includes technical expertise, innovation ability, efficient management hospital image and others .

At present, the definition of hospital core competitiveness is inconclusive. Most Chinese scholars have focused on the determination of hospital core competitiveness. In 2003, Wang(2003) defined hospital core competitiveness as a combination of complementary skills and knowledge which enables hospitals to achieve sustainable competitive advantage in certain field(s). It is a unique capability of the hospital formed through the integration of excellent hospital culture and medical practice.

Li (2003) first defined the core competitiveness of Chinese hospitals as a competitive advantage that distinguishes certain hospitals from other competitors. It is inimitable and sustainable. It is achieved through the definition of hospitals' strategic position, core competitiveness within the organization, as well as duties, responsibilities, and titles at all levels and corresponding evaluation criteria.

Zhao (2004) defined hospital core competitiveness as the competitive advantages which are formed in the hospital's long-term development and contained in the hospital's internal quality, support the hospital's past, present, and future, and enable the hospital to obtain proactive capabilities in a competitive environment for a long time .

Wu (2009) proposed that hospital core competitiveness is reflected in three levels: the first one is the ability to obtain medical resources; the second one is the ability to convert medical resources into effective productivity and occupy an effective market share; the third is the ability to coordinate various production factors of the hospital and optimize the allocation of resources. These three levels are interdependent.

Yang (2011) put forward a definition of hospital core competitiveness that is more in line

with the theoretical foundation of dynamic capabilities, which can enable a hospital to achieve sustainable competitive advantages (manifested in high quality and efficiency) in certain field(s) within certain area. The core competitiveness is the organic combination of a series of complementary technologies and knowledge, and many internal and external resources.

From the perspective of third party, GZ Asclepius Healthcare conducted research and evaluation of hierarchical classification of hospitals and analyzed the hospitals' comprehensive competitiveness from five dimensions: medical technology, resource allocation, hospital operation, sincerity service, and academic and scientific research. The hospitals' medical technology and medical quality are evaluated based on the dimension of medical technology. Resource allocation reflects the security of medical services and the rationality of resource allocation. Hospital operation evaluates the hospitals' operating efficiency and information construction. Sincerity service is consisted of four indexes: public credit, social responsibility, brand influence, and institutional governance. Academic and scientific research assesses the hospitals' situation of outstanding talents, teaching level and scientific research capability (Zhuang et al., 2019).

In summary, this study believes that the definition of hospital core competitiveness should include the following contents: first, hospital core competitiveness is generated in the context of fierce competition in the medical market; second, sustainable competitive advantage is the goal of core competitiveness; third, a series of complementary skills and knowledge (not only a certain medical technology expertise, but also organization management, scientific research and development, and hospital culture) is the main content of core competitiveness; fourth, core competitiveness is inseparable from hospital management, integration, and hospital culture.

2.5.1 Characteristics of hospital core competitiveness

Core competitiveness is the basis for hospitals to obtain sustainable competitive advantages. Not all resources, knowledge, and technologies of hospitals can form core competitiveness. Only by having the characteristics of core competitiveness and being suitable for personalized development of hospitals, can resources, knowledge, and technical capabilities become hospital core competitiveness. Hospital core competitiveness should have the following major requirements (Yang, 2007).

Value: Medical services have market value. As far as the service object is concerned, meeting patients' diagnosis and treatment needs is to realize the value of patients seeking medical treatment; for hospitals, creating long-term competitive initiative is to realize the added value of the hospital.

Uniqueness: Only a very few medical talents or technologies are superior to their opponents or highly advanced. They have a strong value-added, and this value is not easily obtained by competitors. The capital of inherent self-accumulation, potential creativity, and initiative of medical staff is not easy to imitate, and is relatively difficult to be standardized. Moreover, the trust between medical staff and patients is unique.

Scalability: Hospital core competitiveness has a strong radiating effect, which can support the hospital to extend to new and more creative fields. Leading core technologies can support the hospital to provide new technical services for patients and enhance its overall competitive advantage.

Dynamics: Hospital core competitiveness is closely related to the current health policies, resource allocation, and management models. Different development stages show different forms of core competitiveness. The hospital must adapt to market demand, technological progress, and market intervention in a timely manner. Only by tapping and creating new core competitiveness can hospitals meet the needs of the times.

2.5.2 Constituent factors of hospital core competitiveness

(1) Resource factors

The formation of core competitiveness is inseparable from the support of various basic resources of the hospital. From the perspective of hospitals' tangible resources, the financial guarantee for hospitals' construction and development, the equipment investment for promoting high-quality and efficient diagnosis and treatment, and the training expenditures to improve the quality of employees, are all realized through tangible resources. From the perspective of intangible resources, intangible resources are an extremely important asset for human beings. In the current context of fierce technological competition, the value of intellectual property rights lies in its exclusivity; a good hospital reputation can realize value-added; unique behavioral rights and public relations can provide hospitals with harmonious and high-quality development space. In addition, in terms of human resources, human and technical resources are hospitals' important assets. Key employees in the enterprise are the "carriers" of core competitiveness (Prahalad & Hamel, 1990). Human resources can be effectively combined with knowledge, and they can release potential and form competitive advantage.

(2) Capability factors

In the formation of core competitiveness, the simple addition of individual skills, technologies, knowledge, resources, and capabilities cannot constitute core competitiveness. Instead, they must be integrated to undergo functional changes, thereby forming systemic and

strengthened core competitiveness that can significantly outperform competitors and achieve customer value. Management is the factor that can complete the integration of various elements of core competitiveness. Management reflects the coordination and integration of core competitiveness, and the ability and level of hospital management is the core of a hospital (Liu, 2008; Huang, Wu, & Wu, 2009).

There are three key ways to integrate management methods: ① Internal integration: integration of existing resources, capabilities, professional skills, technical knowledge, organization, and management system within the hospital; ② Internal and external integration: coordination and integration between hospital's internal resources and capabilities, and external resources and capabilities introduced through hospital mergers and acquisitions, and alliances; ③ Development strategic integration: under the specific guidance of the hospital's cultural and artistic values and management concepts, hospitals analyze the opportunities brought about by changes in the environment, clarify new development strategies and prospects, and cultivate new competitive advantages. In general, the result of the integration of management methods is building an organization and coordination mechanism within the hospital that can continuously cultivate and accumulate competitive advantages, which is specifically manifested in: ① Coordination between professional knowledge acquisition and the ability to generate factors; ② Coordination between the generation of factor capability and resource application; ③ Organizational coordination between factor capabilities (Yang, 2007).

(3) Hospital culture

In 1981, after the publication of the book *Corporate Cultures: The Rites and Ritual of Corporate Life* co-authored by Professor Deal of Harvard University and management consultant Kennedy, the basic theory of enterprise culture and the management system were announced. Organizational culture is the most important management foundation and the driving force for organizational development as well.

Hospital culture is a collection of values, ethics, codes of conduct, and business philosophy, and is a spiritual fulcrum that is consistent with the hospital's overall goal of basic construction, development strategy and development trend. A good hospital culture and art management system can not only bring strong continuous creative power and cohesion to the hospital, but also determine the value orientation of the hospital's core competitiveness. In the process of constructing core competitiveness of hospitals, the hospital culture plays the role of a pivotal driving factor (Yang, 2007). At the same time, the uniqueness of hospital's culture and art is inseparable from that of core competitiveness (Barton, 1992).

It shall be particularly noted that hospital culture itself is an intangible resource, usually not a strategic resource. However, if it is practiced in certain fields to bring competitive advantages, it can then become a strategic resource. For example, in a certain hospital, there is a weekly meeting of medical staff about diseases, which may become a working culture that can generate knowledge sharing to promote medical practice. This is related to strategic resources. In view of the significant role of hospital culture in the formation of core competitiveness, this study will analyze it as a strategic resource.

2.5.3 The role and mechanism of hospital core competitiveness

The role of hospital core competitiveness can be summarized as the following four aspects (Zhu et al., 2019):

(1) Hospitals' adaptability to changes in the internal and external environment. By creating a self-improving hospital core competitiveness system, the hospital's core competitiveness gets continuously adjusted and innovated, which enables the hospital to adapt to the complex and changing internal and external environment.

(2) Improve hospitals' advantages in the diagnosis and treatment market competition. The uniqueness of hospital core competitiveness enhances the competitive advantage of the hospital's resources, namely the resource advantage; the concentration of hospital core competitiveness enhances competitive advantage at the development strategic level, namely the development strategic advantage; innovation improves hospitals' technology level of diagnosis and treatment, namely the working capability advantage. Therefore, the overall advantage of the hospital in market competition is improved.

(3) Bring excess value to hospitals. Health services are affected by geographical restrictions. If a hospital's comprehensive competitiveness is high, patients from all over the country will be attracted. This kind of excess value brought by the construction of the hospital's core competitiveness is a huge advantage for the hospital in market competition. The core competitiveness of hospitals has value and can bring excess value to hospitals.

(4) Maintain the long-term competitive advantage of the hospital. The core competitiveness is not easy to be imitated by other competitors. The hospital can continuously improve the innovation of its core competitiveness in its operation and management, so as to maintain its persistence

The mechanism of core competitiveness is reflected in the whole process of hospitals participating in the market competition to obtain short-term or long-term competitive advantages. The core competitiveness of a hospital is the basis for participating in market

competition, and its materialization is core product. The innovation of core product brings about final product, which, in medical institutions, refers to medical technologies with competitive advantage. The mastery of this type of technology brings excess benefits to the hospital, which are shown in short-term operating performance and accumulated long-term competitive advantage. In the overall mechanism of core competitiveness, the hospital's strategic review and feedback on the medical market, combined with the continuous updating and enhancing of market demand, have formed a dynamic system of internal and external linkage; and if there is no strategic review and update of the market, a static internal mechanism will be formed. The mechanism by which core competitiveness gains long-term competitive advantage is a dynamic process of internal and external interaction (See Figure 2.3).

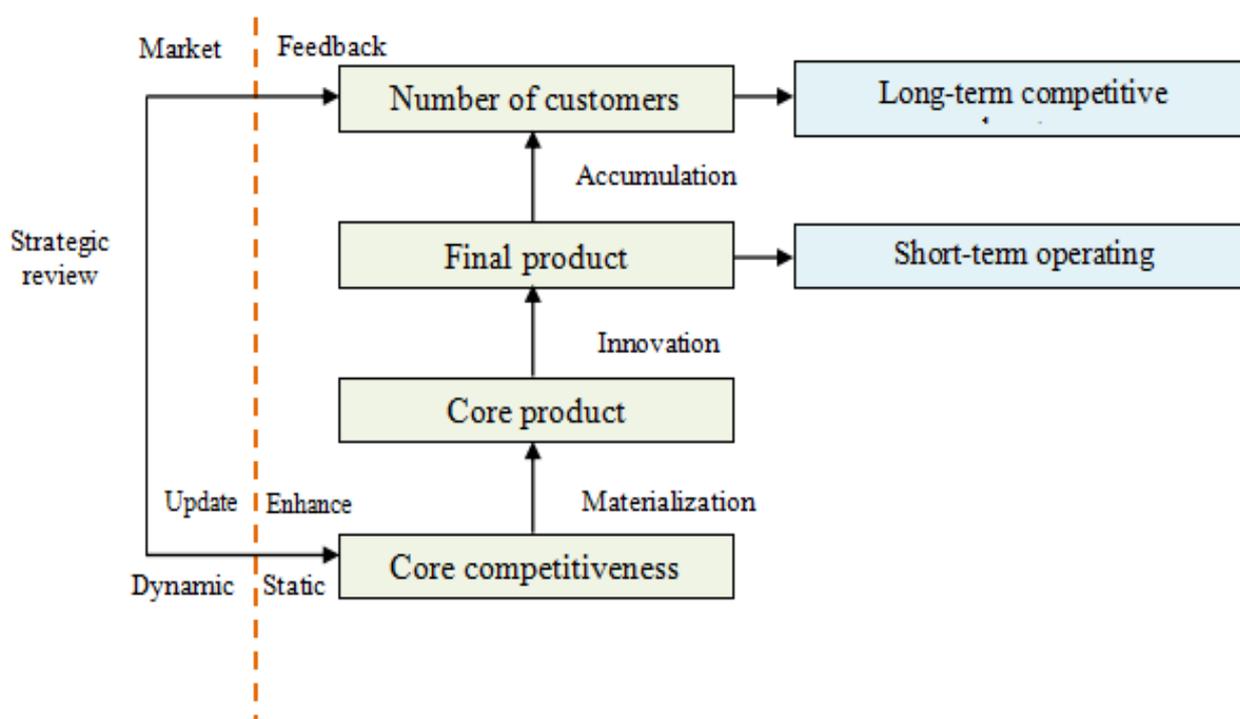


Figure 2.3 Mechanism of core competitiveness

Source: Compiled from (Yang, 2011)

2.5.4 Research on core competitiveness in typical hospitals

The management of foreign medical institutions has always borrowed theories and methods of corporate management. Whether it is a for-profit or non-profit hospital, the core of obtaining a competitive advantage is to build its own core competitiveness. With the strategic theory gradually being favored by domestic hospital managers, many domestic and foreign medical institutions that successfully achieve competitive advantage through creating core competitiveness have emerged. The following is a list of excellent examples of well-established

or very new hospitals at home and abroad which successfully build their core competitiveness (See Table 2.3).

Table 2.3 Core competitiveness of case hospitals at home and abroad

Medical institutions	Core competitiveness	Effect
Peking Union Medical College Hospital	Perseverance in practicing “PUMCH culture”: save lives, revitalize medicine through science and education, inheritance and innovation	Icon in China's medical industry, top of “China's Best Hospitals” for 10 consecutive years
West China Hospital	Eight refined management systems	Ranked second place among China's hospitals, and ranked first in the number of national key clinical specialties in China
The University of Hong Kong-Shenzhen Hospital	Comprehensive introduction of international diagnosis and treatment model: full appointment system, team diagnosis and treatment model, general practice plus specialty, innovative fees; Advanced medical culture: creating green medical service	People from the middle class are the main clients of the hospital
Wuhan Asia Heart Hospital	Precise market positioning and excellent market expansion; Excellent talent team and advanced equipment and facilities; Implement a differentiated technology competition strategy	Create a top 10 national specialty through 16 years of devotion
United Family Healthcare	Humanistic medical services: the ultimate care for people	Create competitive advantage with services; Become the most satisfactory hospital for patients
Chang Gung Memorial Hospital	Organizational structure of “divided duties and unified management”: establishment of specialist operating assistants; motivating physician performance distribution system	Model hospital in cost control and operation
Taichung Veterans General Hospital, Taiwan	Build a learning organization; build a benchmark medical center; balance scorecards to promote reform	Most trusted hospital for the public, most favored institution for medical staff; Highest quality in teaching research, operation and management
Mayo Clinic	Patient-oriented core values; multidisciplinary collaborative diagnosis and treatment; services that exceed customer expectations; always committed to innovation; excellent human resource management	A world-leading medical team; One of the largest non-profit hospitals in the world; Voted US's best hospital for 6 consecutive years.
University of Texas MD Anderson Cancer Center	Brand influence as one of the top medical institutions	Expansion and cooperation

Source: (Gui, 2014; Wang & Huang, 2014; Michael & Thomas, 2015; Xu, 2016)

2.5.5 Model hypothesis of the research of hospital core competitiveness

On the basis of the standards of identification of core competitiveness in medical field, the influencing factors of the formation of core competitiveness, the core concepts of RBV and Dynamic Capability Theory, and the research models such as resource and capability hierarchical classification model and logic structural paradigm (Teece, 2014), we came up with the exploratory hypothesis of core competitiveness research model in medical field. The model framework is shown in Figure 2.4.

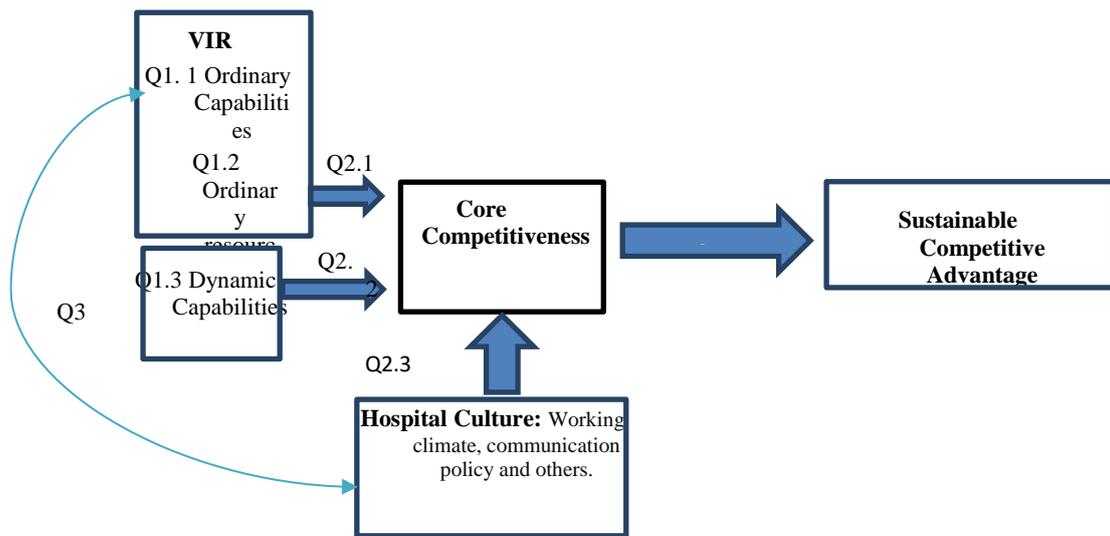


Figure 2.4 Research model of Hospitals' core competitiveness

2.6 Summary

Resources, capabilities and core competitiveness are the basis of competitive advantages. Organizational capabilities can be created by integrating resources. Capabilities are the source of core competitiveness and the core competitiveness is the basis for developing the corporation's sustained competitive advantages. Core competitiveness includes such characteristics as value, rarity, inimitability and organizational structure.

So far, the definition of hospital core competitiveness is inconclusive at home and abroad. Through literature review, the main characteristics of hospital core competitiveness may be summarized as value, specificity, dynamics, extensionality and ductility, the hospital's overall competitive capabilities that cannot be stolen away, purchased, separated, taken away or missed. Hospital core competitiveness may be summarized as the dynamic integration of VRIO resources, which include tangible resources, intangible resources, human resources and organizational capabilities (ordinary capabilities). Organizational culture is a kind of intangible

resource and can become strategic resource; dynamic capabilities encompass environmental insight capabilities, value allocation and integration capabilities and transformation and innovation capabilities. At present, there are insufficient researches on the development strategies of hospital core competitiveness but there are many successful cases, domestically and overseas, which may serve as reference.

[This page is deliberately left blank.]

Chapter 3: Research Methods

The thesis primarily tends to answer the following four research questions:

What is the core competitiveness of medical institutions? (hereinafter referred to as Research Question 1);

How to define the core competitiveness of maternal and child healthcare hospitals? (hereinafter referred to as Research Question 2);

How to cultivate the core competitiveness of maternal and child healthcare hospitals? (hereinafter referred to as Research Question 3);

What is the important role of improving the core competitiveness of maternal and child healthcare hospitals? (hereinafter referred to as Research Question 4).

To answer the above four questions, this study adopts the research plan as follows:

This study employs the Delphi method to construct a core competitiveness evaluation index system for China's maternal and child healthcare hospitals and adopts data from six hospitals at the same level to verify this system. Based upon this, the definition and key elements of the core competitiveness of China's maternal and child healthcare hospitals are demarcated to answer Research Question 1 and 2;

Taking SD Maternal and Child Healthcare Hospital as an example and guided by the core competitiveness evaluation index system of China's maternal and child healthcare hospitals constructed in this study, SWOT analysis was carried out on SD Maternal and Child Healthcare Hospital, combined with the analysis results of round-table conferences and 10-year data review to propose the development strategies for cultivating and enhancing the core competitiveness of maternal and child healthcare hospitals so as to answer Research Question 3;

Through the correlation analysis among the core competitiveness evaluation scores of six hospitals at the same level, the ranking of each element and the ranking of national performance level, and the analysis of the core competitiveness elements of SD Maternal and Child Healthcare Hospital in the past decade, the important role of improving maternal and child healthcare hospitals' core competitiveness was discussed to answer Research Question 4.

Based upon the above research plan, the specific design and implementation methods of this research are as follows:

3.1 Research design

(1) Building of the indicator systems for evaluating core competitiveness of China's maternal and child healthcare hospitals to answer Research Question 1 and 2. Through literature analysis and free listing, this thesis preliminarily sets hierarchical indicators of the system. Grade One indicators include tangible resources, intangible resources, organizational capabilities, dynamic capabilities and hospital culture. This thesis will find out, among these five factors, which are the core competitiveness of hospitals and which can bring competitive advantages. Through Delphi method, this thesis determines the indicator system of core competitiveness of maternal and child healthcare hospitals and the weight coefficient of the indicators, and constructs a model for comprehensive evaluation of core competitiveness. A total of 6 maternal and child health centers at the same level were selected for horizontal comparison, the comprehensive evaluation model was used to score and rank for these four hospitals, and combined with TOPSISI method, 2019 National Maternal and Child Healthcare Hospitals performance evaluation ranking of these four hospitals, then, to check the scientific and feasibility of the comprehensive evaluation model by the correlation analysis of the ranking results of the four methods. The ranking of the comprehensive evaluation model developed in this study is used as the main basis for judging the competitive advantages of each Women and Children's Hospital (See Table 3.1).

Table 3.1 Research contents and methods

Contents	Methods	Objects	Quantity	Purposes
Building of the indicator systems for evaluating core competitiveness of China's maternal and child healthcare hospitals (Q1, Q2)	Delphi method: the first round survey	Middle-level and senior medical professionals, medical management experts	35	To acquire the indicator systems of core competitiveness of maternal and child healthcare hospitals.
	Delphi method: the second round survey	Middle-level and senior medical professionals, medical management experts	35	To select indicators for evaluating core,
	Delphi method: the third round survey	Middle-level and senior medical professionals, medical management experts	35	To determine weight of the indicators
	Horizontal comparison	the same level MCH	6	Verify rationality of the indicator systems

(2) Case study: SD Maternal and Child Healthcare Hospital enhances its core competitiveness strategies to answer Research Questions 3. Through the case analysis, the external environment, the internal resources and capabilities, dynamic capabilities, the strengths

and weaknesses as well as the opportunities and threats of the organizational culture of the Hospital can be analyzed to conduct marketing analysis and positioning so as to put forward strategic choices to enhance core competitiveness. On the basis of the hospital's general situation, this thesis probes into problems existing in the construction of core competitiveness of SD Maternal and Child Healthcare Hospital through staff questionnaire survey, round-table conference and other forms, and discusses the causes of the problems, which serve as a reference of improving core competitiveness. Refer to the index of the comprehensive evaluation model, the data of the SD Maternal and Child Healthcare Hospital for the past 10 years were collected to score and rank, and the scores and rankings were discussed to find the core competitiveness indicators that caused changes in competitive advantage, and to explore the hospital planning or strategy that caused the change of this indicator or such indicator, and guide the formulation of the strategy for improving the core competitiveness of SD Maternal and Child Healthcare Hospital. By conducting questionnaire surveys of customers and marketing analysis and positioning, corresponding strategic choices for improving core competitiveness are proposed. According to the selected strategies, specific measures and related safeguards are taken to improve the core competitiveness of SD Maternal and Child Healthcare Hospital (See Table 3.2).

Table 3.2 Case study tactics

Contents	Methods	Objects	Quantity	Purposes
Status quo of core competitiveness, existing problems and strategies for improvement of SD Maternal and Child Healthcare Hospital	Internal documentat ion	Sales reports, financial reports, human resources reports	—	External Analysis: PESTEL
	direct observatio n	Medical procedures, informal meetings, Operation and management of SD Maternal and Child Healthcare Hospital	—	Internal Analysis: Hospitals' core competitiveness is evaluated from different perspectives according to the established indicator system, and relevant improvement strategies are discussed
	Round-table conference	Staff representative of SD Maternal and Child Healthcare Hospital	30	
	Questionnaire survey (staffs)	Staff of SD Maternal and Child Healthcare Hospital	300	
	Questionnaire survey (customers)	Patients of SD Maternal and Child Healthcare Hospital	250	Customer demand and Market positioning
	comprehensive evaluation	Comparative analysis of data of SD Maternal and Child Healthcare Hospital in the past 10 years	—	Analyses of the previous successful factors can guide the formulation of the future strategies

Note: Senior medical professionals: leaders of health administrative departments, Party Secretary and President of medical institutions and hospital administration experts. Middle-level medical professionals: associate chief physicians and chief physicians of clinical departments, medical departments and functional departments.

(3) Comparative analysis: horizontal comparison and vertical comparison to answer Research Question 4. The correlation analysis among the scores and elements of the core competitiveness of six maternal and child healthcare hospitals at the same level and the performance rankings of the national maternal and child healthcare hospitals in 2018 was conducted, and the core competitiveness elements of SD Maternal and Child Healthcare Hospital that have affected its development in the past decade were also analyzed to discuss the important role of improving maternal and child healthcare hospitals' core competitiveness (See Table 3.3).

Table 3.3 Comparative analysis strategies

Research contents	Research methods	Subjects	Number	Research objectives
Horizontal analysis and vertical analysis	Horizontal analysis	The core competitiveness scores and elements of six maternal and child healthcare hospitals at the same level and the performance ranking of the national maternal and child healthcare hospitals in 2018	1	To discuss the importance of the core competitiveness of maternal and child healthcare hospitals in elevating the overall strength level
	Vertical analysis	SD Maternal and Child Healthcare Hospital's core competitiveness factors affecting development in the past decade	1	To discuss the importance of core competitiveness in hospitals' development

3.2 Research methods

3.2.1 Data collection

3.2.1.1 Literature analysis

Through an extensive search of literature, the authors summarized and clarified experts and scholars' literature on pharmaceutical and health system reform, hospital strategic management, analysis of the components of core competitiveness of maternal and child healthcare hospitals in China, as well as the nature, features, principles, levels and process of strategic management, laying a theoretical foundation for this work. By analyzing published professional journals, government policy documents, Internet data, books and other data, we obtained the latest news

and understood the development of management strategies and measures for improving core competitiveness of maternal and child healthcare hospitals.

3.2.1.2 Delphi method

(1) First-round survey

This study intends to invite an expert group of 35 middle-level and senior administrators from some hospitals in Guangdong, Beijing, Hong Kong SAR, Taiwan and other places as well as experts engaged in research on hospital management and health economics (Fang, 2004; Yang, 2017). All group members could not meet each other directly and they should conduct survey through e-mail or letter. The first-round survey is open questionnaire. By raising prediction questions, the group members were asked to list the indexes which might affect core competitiveness of maternal and child healthcare hospitals.

(2) Second-round survey

We summarized the first-round expert questionnaire, clarified and integrated the indexes of the same kind and conducted a standardized description, based on which we developed all the questionnaires for the second-round survey and invited experts to participate in the second-round survey.

(3) Third-round survey

Through summary and statistics of expert opinion in the second round, we selected and eliminated unmatched standards and sorted out questionnaires used in the third round. Based on the importance evaluation of each index, we calculated the weight of the indexes.

3.2.1.3 Case study

An empirical research concerning SD Maternal and Child Healthcare Hospital was carried out. Through internal documentation and direct observation, round-table conference, questionnaire surveys of staff and customers, the external environment, internal resources and capabilities, dynamic capabilities, strengths and weaknesses, opportunities, and threats of SD Maternal and Child Healthcare Hospital can be analyzed. Marketing analysis and positioning can be conducted to propose strategic choices to enhance core competitiveness, thus forming a competitive advantage.

In the case study, the data were collected through the following methods:

(1) **Internal documentation and direct observation:** Internal documentation and direct observation constituted sources of data to the information provided by respondents, through field investigation, we collected operational statistical data of SD Maternal and Child Healthcare Hospital from 2010 to 2019 for vertical comparison and learned about the hospital's

development trends in the past ten years and its current conditions. Based on the yearbooks and statements of governments at all levels and professional institutions as well as the databases of consulting companies, we horizontally compared the operational status of SD Maternal and Child Healthcare Hospital with the ones of its local competitors at the same level. We also acquainted ourselves with the hospital's market positioning and competitive position to explore the key indicators leading to competitiveness discrepancy.

We conducted five direct observations of specific inter- and intra-team problem solving situations, and of the work methodologies in Medical procedures. Employees were observed outside the work context or in the informal meetings, in order to better understand the informal of Operation and management in the hospital.

(2) **Round-table conference:** Staff representative were convened for round-table conferences, each of which lasted for one hour. They were divided into medical group, nursing group, medical technology group as well as administrative and logistics group, with six to eight members each, for the sake of learning about hospitals' external and internal environment, industry competition conditions, the status quo of hospitals' core competitiveness and existing problems as well as to explore specific strategies for improvement.

(3) **Questionnaire survey:** With reference to the analysis results of the market competition environment of Shunde District Hospital by Shenzhen Kangdaxin Hospital Management Consulting company, and the basic questionnaire survey of the strategic management of employees and patients hospitals designed by the company, combined with the situation of SD Maternal and Child Healthcare Hospital, There were two sets of questionnaires: Questionnaire on Market (Customer) Demands of SD Maternal and Child Healthcare Hospital and Questionnaire on Improvement of Core Competitiveness of SD Maternal and Child Healthcare Hospital (staff).

SD Maternal and Child Healthcare Hospital Market (Customers) Demand Questionnaire: The questionnaire survey including service population and service radius, reasons for consultation, knowing methods, comparison of similar hospitals, consultation needs, attention., randomly selected 300 patients coming to SD Hospital for treatment to finish the survey (Su, 2019) ;

SD Maternal and Child Healthcare Hospital Improved Core Competitiveness Questionnaire (Staff): The questionnaire survey including status assessment, development planning, management system, performance evaluation, salary and treatment, leadership, strengths and weaknesses, existing problems, development prospects for other contents, a total

of 250 staff members of SD Hospital were randomly selected for questionnaire survey (Creative Research Systems, 2020).

3.2.1.4 Quality control

In order to ensure the quality of research progress, quality control is carried out in accordance with Table 3.4.

Table 3.4 Quality control of research process

Project	Research strategy	Research phase	Quality control
Structural Validity	Various research methods are combined	Data collection	Free enumeration, expert rating, expert interview, round-table meeting and literature review. Multiple data are used for mutual verification to enhance the feasibility of the content
		Data collection	To train the research team, unify data collection standards and standardize data collection, collation and analysis methods
	Evidence verification	Data analysis	To establish database and double entry survey data
External Validity	Revise research reports	Writing	To organize the preparation of research results into draft reports, which are reviewed by the research team and industry experts
	Arrangement	Data collection	Detailed research arrangements should be made before the study is carried out
Reliability	Retest reliability and authority coefficient	Questionnaires	To use a unified method to investigate the same object; To carry out the investigation by using the verified questionnaire; The positive coefficient and authority coefficient of appraisal expert

3.2.2 Data collection and analysis

(1) To define the core competitiveness of medical institutions and maternal and child healthcare hospitals

Rank-sum TOPSIS method, National Performance Rankings and other comprehensive evaluation analysis methods are adopted to verify the scientificity and accuracy of the core competitiveness index system of maternal and child healthcare hospitals.

(2) To explore SD Maternal and Child Healthcare Hospital's strategies to enhance its core competitiveness

- PESTEL analysis method was employed to analyze the macro surviving environment of SD Maternal and Child Healthcare Hospital from six aspects of policy, technology, environment, society, economy and law to identify the opportunities and threats in the Hospital's future development.

- Based on the round-table conferences and questionnaire surveys of internal staff, the core competitiveness index system of maternal and child healthcare hospitals is developed according to this research and the core competitiveness of SD Maternal and Child Healthcare Hospital is evaluated from different perspectives of resources, capabilities, dynamic capabilities, and hospital culture and others. The improvement strategies were discussed and at the same time, the strengths and weaknesses of SD Maternal and Child Healthcare Hospital were figured out.

- Through questionnaire surveys of patients, the composition of patients can be understood, industry competition analyzed, and customer needs, market positioning and overall strategic choices clarified.

- The comprehensive evaluation model developed in this study was utilized to analyze the core competitiveness related data of SD Maternal and Child Healthcare Hospital in the past 10 years. The analysis results to explore the success factors of the past SD Maternal and Child Healthcare Hospital were discussed to guide the formulation of strategies for enhancing core competitiveness in the future.

- The SWOT matrix was employed to summarize and analyze the Hospital's internal strengths, weaknesses, external opportunities and threats, and propose SO, ST, WO and WT strategic recommendations.

- Pursuant to the market competition environment and the market competition strategies determined by SD Maternal and Child Healthcare Hospital's own conditions, the competitive strategy analysis method was adopted to formulate specific strategies implementation steps and safeguards for the market competition strategies, thus promoting the implementation and effectiveness of the market strategies and plans.

(3) To explore the role of core competitiveness in the reform and development period of maternal and child healthcare hospitals

The correlation analysis was conducted among the scores and elements of the core competitiveness of six maternal and child healthcare hospitals at the same level and the performance rankings of the national maternal and child healthcare hospitals in 2018, and the core competitiveness elements of SD Maternal and Child Healthcare Hospital affecting its

development in the past 10 years were analyzed to discuss the important role of improving maternal and child healthcare hospitals' core competitiveness.

[This page is deliberately left blank.]

Chapter 4: Evaluation Index System of Core Competitiveness of Maternal & Child Healthcare Hospital

The Delphi method was employed to construct an evaluation index system for the core competitiveness of China's Maternal and Child Healthcare Hospitals, and the data from six hospitals at the same level was used to verify this system. Based upon this, the definition and key elements of the core competitiveness of China's medical institutions and Maternal and Child Healthcare Hospitals were demarcated to answer Research Question 1 & 2.

The correlation analysis was conducted among the total scores of the core competitiveness evaluation of six hospitals at the same level, the ranking of each element and the ranking of national performance level so as to answer Research Question 4.

4.1 Delphi method

4.1.1 Basic information of experts

In this research, we invited a total of 35 interviewees, including middle-level and senior administrators of hospital, health economics experts as well as hospital managers, covering such fields as hospital management, information management, performance management, health economics, clinical medicine, health statistics, human resource management and public health. Among them, 32 experts, including 15 male experts and 17 female experts, have participated in the three rounds of survey and the rate of questionnaire collection was 91.4%. Their average age is (45.8 ± 7.8) and all of them have a bachelor degree or above: 93.7% of the experts have a working experience of over 10 years and 71.9% of them hold deputy senior and senior titles; 16 experts with a bachelor's degree (50.0% of the total); 11 experts with a master's degree (34.4%) and 5 experts with a doctoral degree (15.6%). Among the 32 interviewees, 9 experts (28.1% of the total) are senior administrators of hospital; 18 experts (56.3%) are middle-level administrators and 5 experts (15.6%) specialize in health management.

4.1.2 First-round survey results

Based on the literature review, this study has drawn up five first-class indexes of tangible resources, intangible resources, organizational capabilities and hospital culture. In the first-round open questionnaire survey, 32 experts proposed 28 indexes concerning the influencing factors of core competitiveness of maternal and child healthcare hospitals. The concerned indexes include: discipline construction, information construction, talent development, operational capabilities, level of diagnosis and treatment, hospital culture, jurisdiction management, technological innovation capability, staff structure and personnel quality of managers.

Summary rules on survey results: each new point of view put forward by the survey subject is listed as a factor, and different expressions with the same or similar meaning are listed as the same type of point of view. If a point of view is only mentioned by one of the respondents, and no similar views can be summarized, it will not be included in the evaluation index system.

The factors related to the core competitiveness of the Maternal & Child Healthcare Hospital obtained from the interview are shown in Table 4.1.

Table 4.1 Summary of the results of the questionnaire: factors affecting the core competitiveness of the Maternal & Child Healthcare Hospitals

Serial number	Influential factors	Frequency
1	Discipline construction	21
2	Information construction	20
3	Hospital culture	17
4	Operational capabilities	16
5	Talent development	14
6	Jurisdiction management	13
7	Technological innovation capability	10
8	Staff structure	10
9	Personnel quality of managers	10
10	Patient satisfaction	9
11	Level of diagnosis and treatment	7
12	Service innovation	7
13	Strategic planning	7
14	Performance incentive	6
15	Whole-course childbirth services	6
16	Marketing capabilities	6
17	Hospital environment	5
18	Equipment	5
19	Hospital reputation	5
20	Employee satisfaction	5
21	Integrating healthcare services	4
22	Research investment	4
23	Learning and training	4
24	Hospital core values	3

25	Cost effectiveness	3
26	Service brand	2
27	Cultural package	2
28	Public credit	2

4.1.3 Second-round survey results

4.1.3.1 Questionnaire design and distribution

1) Questionnaire design: In combination with the results of first-round expert survey and literature review, four Level-1 indexes and 75 indexes are initially drawn up for evaluation. Each indicator is assigned four characteristics: valuable, scarce, difficult to imitate, and difficult to replace. The four characteristics are set as multiple options.

2) Questionnaire issuance: It is distributed to the selected 32 experts face to face, thorough email or other measures.

4.1.3.2 Positive coefficient of experts

The positive coefficient of experts can reflect the degree of cooperation of experts on this consulting research project. Usually, it can be evaluated by the recovery rate of the expert consultation form. The size of the positive coefficient of experts can reflect the reliability of the consultation results to a certain extent.

The formula for calculating the positive coefficient is: $C_j = \frac{M_j}{M}$, in which M_j represents the number of questionnaires recovered from the surveyed experts, and M is the number of questionnaires issued to experts.

In the first round of expert consultation in this study, 35 questionnaires were distributed, and 32 valid questionnaires were returned. The positive coefficient of experts in the first round was 91.42%, while that in the second and third rounds were both 100%.

4.1.3.3 Authority of expert opinions

Experts' familiarity with research schemes and the basis for making judgments on the research indexes are the two important factors that determine the authority of expert opinions. Expert authority is represented by C_r , which is the arithmetic average of expert familiarity coefficient and judgment coefficient, and the calculation formula is: $C_r = \frac{C_s + C_a}{2}$. This study divides the experts' familiarity with the solution into five levels: very familiar, relatively familiar, general, not very familiar, and unfamiliar. The judgment basis includes theoretical analysis, work experience, references, peer understanding, and intuitive experience. All the above items are assigned with scores, as shown in Table 4.2 for specific assignments.

Table 4.2 Experts' familiarity with the scheme and the assignment of judgment basis

Familiarity	Value	Judgment basis	Value
Very familiar	1.0	Theoretical analysis	1.0
Relatively familiar	0.8	Work experience	0.8
General	0.6	References	0.6
Not very familiar	0.4	Peer understanding	0.4
Unfamiliar	0.2	Intuitive experience	0.2

1) Expert familiarity coefficient

The expert familiarity coefficient is often represented by C_s . According to the statistical results of the familiarity score of the level-1 indicators, the experts' scores on familiarity with the level-1 indicators are all greater than 0.75, indicating that the experts have a relatively high degree of familiarity with the content of this study. See Table 4.3.

Table 4.3 Expert familiarity coefficient

Index	Familiarity	Frequency	Value	Score	C_s
1. Tangible resources	Very familiar	13	1	13	0.86
	Relatively Familiar	16	0.8	12.8	
	General	3	0.6	1.8	
	Total	32	—	27.6	
2. Intangible resources	Very familiar	9	1	9	0.81
	Relatively Familiar	16	0.8	12.8	
	General	7	0.6	4.2	
	Total	32	—	26	
3. Dynamic capabilities	Very familiar	8	1	8	0.79
	Relatively familiar	16	0.8	12.8	
	General	6	0.6	3.6	
	Not very familiar	2	0.4	0.8	
	total	32	—	25.2	
4. Organizational capabilities	Very familiar	7	1	7	0.76
	Relatively familiar	14	0.8	11.2	
	General	9	0.6	5.4	
	Not very familiar	2	0.4	0.8	
	Total	32	—	24.4	
5. Hospital culture	Very familiar	11	1	11	0.81
	Relatively familiar	14	0.8	11.2	
	General	5	0.6	3.0	

Not very familiar	1	0.4	0.4
Total	1	0.2	0.2
Very familiar	32	—	25.8

2) Expert judgment coefficient

The expert judgment coefficient is often represented by C_a . The statistical results show that the judgment coefficient scores of level-1 index are all greater than 0.70, indicating that the judgment basis has a rather great influence on the experts. The expert judgment is mainly based on theoretical analysis and work experience, partly based on references and peer understanding, and rarely based on intuitive feelings, thus guaranteeing its reliability (See Table 4.4).

Table 4.4 Expert judgment coefficient

Index	Judgments basis	Frequency	Value	Score	C_a
1. Tangible resources	Theoretical analysis	5	1	5	0.77
	Work experience	22	0.8	17.6	
	References	2	0.6	1.2	
	Peer understanding	1	0.4	0.4	
	Intuitive experience	2	0.2	0.4	
	Total	32	—	24.6	
2. Intangible resources	Theoretical analysis	6	1	6	0.70
	Work experience	16	0.8	12.8	
	References	3	0.6	1.8	
	Peer understanding	2	0.4	0.8	
	Intuitive experience	5	0.2	1.0	
	Total	32	—	22.4	
3. Dynamic capabilities	Theoretical analysis	2	1	2	0.72
	Work experience	23	0.8	18.4	
	References	2	0.6	1.2	
	Peer understanding	2	0.4	0.8	
	Intuitive experience	3	0.2	0.6	
	Total	32	—	23.0	
4. Organizational capabilities	Theoretical analysis	4	1	4	0.74
	Work experience	21	0.8	16.8	

	References	2	0.6	1.2	
	Peer understanding	3	0.4	1.2	
	Intuitive experience	2	0.2	0.4	
	Total	32	—	23.6	
	Theoretical analysis	4	1	4	
	Work experience	18	0.8	14.4	
5. Hospital culture	References	5	0.6	3.0	0.71
	Peer understanding	1	0.4	0.4	
	Intuitive experience	4	0.2	0.8	
	Total	32	—	22.6	

3) Authority coefficient on expert opinions

Integrating the above familiarity coefficient and judgment coefficient, the expert authority coefficient of this study can be calculated. All of the C_r of level-1 indicators is greater than 0.75, which shows that the 32 experts in this study have a high degree of authority and their opinions are of high credibility. See Table 4.5.

Table 4. 5 Authority coefficient on expert opinions of the level-1 indicators

Index	Familiarity coefficient C_s	Judgment coefficient C_a	Authority coefficient C_r
1. Tangible resources	0.86	0.77	0.82
2. Intangible resources	0.81	0.70	0.76
3. Dynamic capabilities	0.79	0.72	0.76
4. Organizational capabilities	0.76	0.73	0.75
5. Hospital culture	0.81	0.71	0.76

4.1.3.4 Index selection results

Based on the evaluation and opinions of 32 experts, we combined the same or similar indexes and selected the indexes based on the following rules: as long as one expert believes that a certain index does not have the four characteristics, this index will be eliminated; if over two thirds of the experts consider that a certain index only has “value”, this index will also be eliminated.

After the second-round survey, we determined that the index system was: eight Level-1 indexes, including human resources, information resources, social relations resource, strategic management capability, technological service innovation capability, medical service capability, jurisdictional management capability and hospital culture, and 41 measurable evaluation indexes.

4.1.4 Third-round survey results

After selection, we developed an index system including eight Level-1 indexes and 41 Level-2 indexes. Based on their importance, the weight of these indexes were graded with five choices: very important, important, generally important, unimportant, and very unimportant. We used the semi-closed questionnaires, with an open opinion column set. Please refer to Table 4.6 for the indexes and weight of indexes of core competitiveness of maternal and child healthcare hospitals.

Table 4.6 Authority coefficient on expert opinions of the level-1 indicators

Level-1 index	Weight	Serial number	Level-2 index	Assignment description	Weight	Approach
1. Human resources	0.129	1	Quality of the hospital management	Score=average management years/average age×150+150-average age×2; this indicator is assigned according to the ratio of the surveyed hospital's score compared with the average: X≥80%, assign value 1 60%≤X<80%, assign value 0.5 X<60%, assign value 0	0.036	High quality
		2	Proportion of health technicians with senior professional titles	Score = (number of sanitation technicians with senior professional title + number of sanitation technicians with associate senior professional title)/total number of sanitation technicians in the hospital. Assignment approach: X≥1/4, assign value 1 1/5≤X<1/4, assign value 0.5 X<1/5, assign value 0	0.032	High quality
		3	Proportion of health technicians with master's degree or above	Score = Number of health technicians with master's degree or above/total number of health technicians in the hospital, assignment approach: X≥10%, assign value 1 X<10%, assign value 0	0.033	High quality
		4	Proportion of people engaged in group healthcare	Score=group healthcare technicians/total number of health technicians in the whole hospital. This indicator is assigned based on the ratio of the surveyed hospital's score compared with the average value: X≥80%, assign value 1 60%≤X<80%, assign value 0.5 X<60%, assign value 0	0.028	High quality
2. Information resources	0.122	5	Function level classification of electronic medical record application	Level 4 and above = 1 Level 3 = 0.5 Level 2 and below=0	0.030	High quality

3. Social relations resources	0.118	6	Standardization maturity evaluation of hospital information interconnection	Level 4 and above = 1 Level 3 = 0.5 Level 2 and below=0	0.031	High quality
		7	Classification of smart medical care	Level 3 and above = 1 Level 2 = 0.5 Level 1 and below=0	0.030	High quality
		8	Security protection level of network information system	Level 3 and above = 1 Level 2 = 0.5 Level 1 and below=0	0.031	High quality
		9	Post-doctoral research center, doctoral program, master program	Doctoral program and postdoctoral research center=1 Master's program = 0.5 None=0	0.029	High quality
		10	Average number of health and technical personnel from foreign hospitals	Score = the number of people from outside hospitals who come to the hospital to study/the number of health and technical personnel; this indicator is assigned based on the ratio of the surveyed hospital's score to the average value: X ≥ 80%, assign value 1 60% ≤ X < 80%, assign value 0.5 X < 60%, assign value 0	0.026	High quality
		11	Hospital reputation index	Score = the number of nonlocal inpatients/total number of inpatients per year, assignment method: X ≥ 30%, assign value 1 10% ≤ X < 30%, assign value 0.5 X < 10%, assign value 0	0.031	High quality
12	Patient satisfaction	Including 2 sub-projects: inpatient satisfaction and outpatient satisfaction. This indicator is scored by the formula: $\frac{1}{n} \sum_{i=1}^n R_i$ (n: the number of sub-columns, R_i : the score of the i-th sub-column). X ≥ 95%, assign value 1 90% ≤ X < 95%, assign value 0.8 85% ≤ X < 90%, assign value 0.6	0.036	High quality		

4. Strategic management capability	0.130	13	To determine hospital goals and mid- and long-term development plans	<p>80% ≤ X < 85%, assign value 0.4 X < 80%, assign value 0.2</p> <p>Including 3 sub-projects: hospital five-year plan, hospital ten-year plan, and hospital development goals. Yes=1, no=0.</p> <p>This indicator is scored by the formula $\frac{1}{n} \sum_{i=1}^n R_i$: (n: the number of sub-columns, R_i : the score of the i-th sub-column).</p>	0.033	High quality
		14	Perfect talent introduction and incentive mechanism	<p>Including 2 sub-projects: talent introduction system and talent incentive system. Yes=1, no=0.</p> <p>This indicator is scored by the formula $\frac{1}{n} \sum_{i=1}^n R_i$: (n: the number of sub-columns, R_i : the score of the i-th sub-column).</p>	0.033	High quality
		15	Subject construction level	<p>National key specialty=1 Provincial key specialty = 0.8 Municipal key specialty = 0.4 None=0</p>	0.033	High quality
		16	Perfect performance incentive system	<p>Including 4 sub-projects: performance incentive system, performance appraisal scoring standards, college-level annual performance appraisal, department-level annual performance appraisal. Yes=1, no=0.</p> <p>This indicator is scored by the formula $\frac{1}{n} \sum_{i=1}^n R_i$: (n: the number of sub-columns, R_i : the score of the i-th sub-column).</p>	0.030	High quality
5. Technological innovation capability	0.128	17	Proportion of supporting research funding to total funding expenditure	<p>Score = supporting funds for scientific research projects/total annual expenditures of the hospital. This indicator is assigned based on the ratio of the surveyed hospital's score to the average value: X ≥ 80%, assign 1 60% ≤ X < 80%, assign value 0.5</p>	0.017	High quality

18	The proportion of education and training expenses in total expenditure	<p>$X < 60\%$, assign value 0</p> <p>Score=education and training expenses/total annual hospital expenditure. This indicator is assigned according to the ratio of the surveyed hospital's score to the average value:</p> <p>$X \geq 80\%$, assign 1</p> <p>$60\% \leq X < 80\%$, assign value 0.5</p>	0.018	High quality
19	Funds for scientific research projects per 100 health technicians	<p>$X < 60\%$, assign value 0</p> <p>Score = scientific research project funding / total number of health and technical personnel $\times 100$, this indicator is assigned based on the ratio of the surveyed hospital's score to the average value:</p> <p>$X \geq 80\%$, assign 1</p> <p>$60\% \leq X < 80\%$, assign value 0.5</p>	0.018	High quality
20	Number of core journals and SCI papers per 100 health technicians	<p>$X < 60\%$, assign value 0</p> <p>Score = (number of core journal papers*1+number of SCI papers*2)/total number of health and technical personnel$\times 100$, this indicator is assigned based on the ratio of the surveyed hospital's score to the average value:</p> <p>$X \geq 80\%$, assign 1</p> <p>$60\% \leq X < 80\%$, assign value 0.5</p>	0.018	High quality
21	Number of new technology business developments per 100 health technicians per year	<p>$X < 60\%$, assign value 0</p> <p>Score = number of new technology business development/total number of health technicians$\times 100$. This indicator is assigned based on the ratio of the surveyed hospital's score to the average value:</p> <p>$X \geq 80\%$, assign 1</p> <p>$60\% \leq X < 80\%$, assign value 0.5</p>	0.019	High quality
22	Integrated healthcare services	<p>$X < 60\%$, assign value 0</p> <p>Including 3 sub-projects: healthcare service referral system, complete healthcare service departments (nutrition, psychology, rehabilitation, traditional Chinese medicine, and others), integrated healthcare service training. Yes=1, no=0.</p>	0.019	High quality

			This indicator is scored by the formula $\frac{1}{n} \sum_{i=1}^n R_i$: (n: the number of sub-columns, R_i : the score of the i-th sub-column).			
		23	To provide full birth service	Including 5 sub-projects: full-service system and procedures for childbirth, pre-pregnancy healthcare, pregnancy healthcare, postpartum healthcare, and child healthcare. Yes=1, no=0.	0.019	High quality
				This indicator is scored by the formula $\frac{1}{n} \sum_{i=1}^n R_i$: (n: the number of sub-columns, R_i : the score of the i-th sub-column).		
6. Medical service capability	0.129	24	Annual number of DRG groups	This indicator is assigned based on the ratio of the surveyed hospital's score compared to the average value: $X \geq 80\%$, assign value 1 $60\% \leq X < 80\%$, assign value 0.5 $X < 60\%$, assign value 0	0.019	High quality
		25	Yearly inpatient CMI value	This indicator is assigned based on the ratio of the surveyed hospital's score compared to the average value: $X \geq 80\%$, assign 1 $60\% \leq X < 80\%$, assign value 0.5 $X < 60\%$, assign value 0	0.019	High quality
		26	Proportion of discharged patients with minimally invasive surgery	This indicator is assigned based on the ratio of the surveyed hospital's score compared to the average value: $X \geq 80\%$, assign value 1 $60\% \leq X < 80\%$, assign value 0.5 $X < 60\%$, assign value 0	0.018	High quality
		27	Proportion of discharged patients with grade 4 surgery	This indicator is assigned based on the ratio of the surveyed hospital's score compared to the average value: $X \geq 80\%$, assign value 1 $60\% \leq X < 80\%$, assign value 0.5 $X < 60\%$, assign value 0	0.019	High quality

		28	Complication rate of surgical patients	$X < 40\%$, assign value 1 $X \geq 40\%$, assign value 0	0.018	Low-quality
		29	Hospital infection rate	$X < 10\%$, assign value 1 $X \geq 10\%$, assign value 0	0.019	Low-quality
		30	Percentage of intensive care beds	This indicator is assigned based on the ratio of the surveyed hospital's score compared to the average value: $X \geq 80\%$, assign value 1 $60\% \leq X < 80\%$, assign value 0.5 $X < 60\%$, assign value 0	0.017	High quality
7. Jurisdictional Management Capability	0.120	31	Annual live births as a percentage of live births in midwifery institutions in the jurisdiction	This indicator is assigned based on the ratio of the surveyed hospital's score compared to the average value: $X \geq 80\%$, assign value 1 $60\% \leq X < 80\%$, assign value 0.5 $X < 60\%$, assign value 0	0.021	High quality
		32	Maternal mortality rate in jurisdiction	$\leq 18/100,000 = 1$ $> 18/100,000 = 0$	0.021	Low-quality
		33	Infant mortality rate in jurisdiction	$\leq 7.5\text{‰} = 1$ $> 7.5\text{‰} = 0$	0.021	Low-quality
		34	System management rate of pregnant women in jurisdiction	$\geq 85\% = 1$ $< 85\% = 0$	0.019	High quality
		35	Pre-pregnancy eugenic examination coverage rate of the target population	$\geq 80\% = 1$ $< 80\% = 0$	0.019	High quality
		36	Screening rate of neonatal genetic and metabolic diseases in the jurisdiction	$\geq 90\% = 1$ $< 90\% = 0$	0.020	High quality
8. Hospital culture	0.124	37	Unified VI system	Including 5 sub-projects: hospital emblem, hospital flag, hospital logo, hospital song, hospital uniform. Yes=1, no=0.	0.022	High quality

		This indicator is scored by the formula $\frac{1}{n} \sum_{i=1}^n R_i$: (n: the number of sub-columns, R_i : the score of the i-th sub-column).		
38	Service specifications, initiatives, and brands	Including 4 sub-projects: service culture training, quality service departments, quality service system, and quality service evaluation standards. Yes=1, no=0.	0.025	High quality
		This indicator is scored by the formula $\frac{1}{n} \sum_{i=1}^n R_i$: (n: the number of sub-columns, R_i : the score of the i-th sub-column).		
39	The core values, mission and vision of the hospital	Including 3 sub-projects: core values, hospital mission, and development vision. Yes=1, no=0.	0.025	High quality
		This indicator is scored by the formula $\frac{1}{n} \sum_{i=1}^n R_i$: (n: number of sub-columns, R_i : score of the i-th sub-column).		
40	Brand communication	Including 2 sub-items: news media level (provincial level and above=1, municipal level=0.5, others=0); monthly maximum reading volume (more than 50,000=1, more than 30,000=0.5, others=0)	0.024	High quality
		This indicator is scored by the formula $\frac{1}{n} \sum_{i=1}^n R_i$: (n: the number of sub-columns, R_i : the score of the i-th sub-column).		
41	Employee satisfaction	X \geq 95%, assign value 1 90% \leq X<95%, assign value 0.8 85% \leq X<90%, assign value 0.6 80% \leq X<85%, assign value 0.4 X<80%, assign value 0.2	0.027	High quality

4.1.5 Summary of third-round survey results

Through sorting out experts' opinions on selecting and sifting indexes, index monitoring and index significance, the chief summary was made as follows:

- Resource and organizational capabilities selection from the perspective of VRIO demonstrates that human resources, information resources, social relationship resources, medical service provision capabilities, district management capabilities among others have displayed more significant inimitability and irreplaceability than other resources and capabilities.

- In the human resources indexes, experts particularly emphasize the important role of human resources in the formation of core competitiveness, and hold that human technical resources are essential assets of hospitals, which serve as the critical carrier of meeting patients' needs, providing technical support and technological innovation. Additionally, more than two-thirds of the experts in the survey reckon that: (1) Special attention shall be paid to the investment in learning and scientific research during the evaluation and application of human resource indexes; (2) The quality of managerial personnel, especially the quality of decision-making teams can play a crucial role in the improvement of core competitiveness.

- For information resource indexes, what experts mention frequently is that the quality and level of information resources shall be combined with the development of the times, and updated in time. As modern science and technology develops rapidly, the supporting role of hospital information construction is particularly conspicuous and at the same time, the construction of smart hospitals is also one of the pivotal elements.

- In the social relations resources, experts note that hospitals' brand strength and favorable reputation can bring customer resources and realize the added value;

- In hospitals' organizational capability indexes, experts tend to selecting medical service capabilities and jurisdictional management capabilities. Among the medical service capabilities, experts emphasize medical quality management and the capabilities to treat patients with rarely-seen and severe diseases; jurisdictional management capabilities are the organizational capabilities that have the characteristics of maternal and child health-care hospitals, and are also one of the significant elements to enhance core competitiveness.

- In hospitals' dynamic capability indexes, experts focus on selecting strategic management capabilities and technological service innovation capabilities. In the strategic management capabilities, experts emphasize the training and introduction of hospital talents

and the construction of key specialties; in terms of technological innovation capabilities, experts not only believe that scientific research investment is significant, but also particularly emphasize the capability to establish an integrated healthcare service system. They also hold that the capability to build an integrated healthcare service system is a critical core competitiveness index that distinguishes health-care centers from medical institutions. Only when an integrated health-care service system is effectively established can healthcare be combined with clinical practice to highlight the disciplinary characteristics of healthcare institutions, and meet people's demands of high-quality health-care in the new era.

- In hospitals' cultural indexes, experts reckon that hospital culture plays a leading part in hospitals' strategic development, especially the establishment of core values, which can promote the collaboration of staff in the formation of hospitals' core competitiveness and enhance the inimitable nature of the core competitiveness. In the survey of the elements of core values, experts hold the concentrated opinion that due to the particularity of the service target, healthcare centers should pay more attention to the caring service culture, not only to do a good job in customer care, but also to do well in internal staff care. In addition, experts emphasize a culture with the aim of encouraging innovation, that only when staff conduct diversified business explorations, can they help hospitals maintain the source of innovation, enter the next generation of innovation, and maintain a competitive advantage in a rapidly changing environment.

4.2 Comprehensive evaluation model of core competencies of maternal and child healthcare hospitals

The common methods for calculating the total score in the composite grade method include accumulation method, continual multiplication, addition and multiplication, and weighting method. This study uses the weighting method to incorporate the weighted coefficient of the index into the calculation of the total score, and adopts the accumulation method to add up to the total score, and then rank the total score from high to low. Among them, the sum of weight coefficients of all levels of indexes is 100%, while the assigned highest score of each index is 1 point, the base of multiple is 100, and the total score is between 0 and 100 points. The calculation method is as follows:

$$S = \sum_{i=1}^n W_i S_i \times 100 \dots\dots\dots(4.1)$$

In the formula, W_i is the weighting coefficient of the i -th index, namely the combined weighting coefficient calculated by the three-level index in the study; S_i is the score of the i -th index.

4.3 Empirical results

4.3.1 Empirical methods

The main purpose of the empirical study is to obtain the data of the index of the evaluation model of core competencies of six maternal & child Healthcare Hospitals to calculate the total score by using the calculation method of total score of the model. In this study, two methods are used to obtain the data:

1) Questionnaire: The questionnaire of empirical data is designed according to the index system formed after the screening of indexes based on the Delphi method, and there are specific explanations of the sources of the index and instructions for filling in the index. The hospital data is mainly based on the year-end statistical data in 2019. Before the questionnaire survey is carried out, the person in charge of the hospital is briefed on the research, and the person in charge of the hospital office organizes the relevant departments of the hospital to fill in the questionnaire truthfully according to the survey requirements.

2) Website inquiries: Part of the index data of the study is collected from the official websites of six maternal & child healthcare hospitals by project team members. Two researchers fill in the data questionnaire respectively and use it after the consistency check of the two statistics. The data obtained can prove the authenticity of the survey data to a certain extent, and play the role of data verification and correction.

4.3.2 Empirical results

With the evaluation model of core competencies of maternal and child healthcare hospitals and the total score scheme established in this study, the author calculates the total score of 41 indexes of six empirical maternal and child healthcare hospitals, the ranking of comprehensive scores of six evaluation objects. The evaluation results of the comprehensive scoring model show that the scores of these six empirical hospitals are, in descending order, H1, H6, H2, H5, H3 and H4. Among them, H1 and H6 are relatively high in core competencies with scores higher than 80, while H4 is at a relatively low level with a score

lower than 60. The score results conform to the general rules of the judgment of superiority and inferiority and are discrimination. See Table 4.7 and Table 4.8.

4.3.3 Model validation

4.3.3.1 National performance ranking in 2018

Through data survey and query, the 2018 empirical national performance ranking of six hospitals is obtained. The national ranking order from H1 to H6 in descending order is: H1、H6、H2、H5、H3、H4. The national performance ranking reflects the comprehensive strength of maternal & child healthcare hospitals to a certain extent, which can be used as one of the ways to verify the core competencies of maternal & child healthcare hospitals, and it has certain reference value.

4.3.3.2 Weighted TOPSIS method

TOPSIS method (technique for order preference by similarity to ideal solution) is to find out the optimal solution and the worst solution in the limited solutions based on the normalized original data matrix, and then respectively calculate the distance between each evaluation object as well as between the optimal solution and the worst solution to obtain the relative proximity between each evaluation object and the optimal solution. It can be used as the basis for evaluating the superiority and inferiority of the object.

Core Competitiveness Strategic Thinking in China's Maternal and Child Healthcare Hospitals

Table 4.7 First-level indexes scores and total scores of the six hospitals using the composite grade method

Maternal & Child Healthcare Hospitals	Human resources	Information resources	Social relation resources	Strategic management capability	Technological innovation capability	Medical service capability	Jurisdictional management capability	Cultural system	Total
H1	6.5	12.2	8.5	12.9	11.0	10.1	10.0	10.6	81.8
H2	9.7	3.1	4.2	10.9	8.4	12.9	12.1	8.9	70.2
H3	5.2	4.6	6.2	10.9	7.5	9.2	12.1	10.0	65.7
H4	3.6	4.6	7.4	10.9	3.8	8.4	10.1	11.1	59.9
H5	5.0	4.6	4.7	10.9	9.2	12.9	10.1	8.9	66.4
H6	9.7	9.2	9.3	12.2	12.8	9.3	8.1	10.7	81.3

Table 4.8 Scores and ranking of total scores of the first-level indexes of six hospitals using the composite grade method

Maternal & Child Healthcare Hospitals	Human resources	Information resources	Social relation resources	Strategic management capability	Technological innovation capability	Medical service capability	Jurisdictional management capability	Cultural system	Ranking
H1	3	1	2	1	2	3	5	3	1
H2	1	6	6	3	4	1	1	5	3
H3	4	3	4	3	5	5	1	4	5
H4	6	3	3	3	6	6	3	1	6
H5	5	3	5	3	3	1	3	5	4
H6	1	2	1	2	1	4	6	2	2

There are altogether six evaluation objects, and 41 evaluation indexes in this study, namely, $n=6$, and $m=41$.

1) The index is treated with the same trending method, and the low-priority index is transformed into the high-priority index by means of reciprocal, namely, $X'_{ij}=1/X_{ij}$.

2) The original data matrix is dealt with the same trending method after normalization, namely:

$$a_{ij} = \begin{cases} X_{ij} / \sqrt{\sum_{i=1}^n X_{ij}^2} \\ X'_{ij} / \sqrt{\sum_{i=1}^n (X'_{ij})^2} \end{cases} \dots\dots\dots(4.2)$$

3) Based on the obtained normalized matrix, the optimal scheme A^+ and the worst scheme A^- are found from the limited schemes, namely:

$$A^+ = (a_{i1}^+, a_{i2}^+, \dots, a_{im}^+) \dots\dots\dots(4.3)$$

$$A^- = (a_{i1}^-, a_{i2}^-, \dots, a_{im}^-) \dots\dots\dots(4.4)$$

4) Combined with the weighting coefficient, the distance D^+ between the evaluation object and the optimal scheme and the distance D^- between the evaluation object and the worst scheme are calculated respectively, namely:

$$D_i^+ = \sqrt{\sum_{j=1}^m [\omega_j (a_{ij} - a_{ij}^+)]^2} \dots\dots\dots(4.5)$$

$$D_i^- = \sqrt{\sum_{j=1}^m [\omega_j (a_{ij} - a_{ij}^-)]^2} \dots\dots\dots(4.6)$$

5) Calculating the proximity C_i between the evaluation object and the optimal scheme, namely:

$$C_i = \frac{D_i^-}{D_i^+ + D_i^-} \dots\dots\dots(4.7)$$

6) C_i is between 0 and 1. Generally, the closer it is to 1, the better; the evaluation objects are ranked based on the value of C_i .

(X_{ij} is the value of the i -th evaluation object in the j -th index; X'_{ij} is the value of the i -th evaluation object in the j -th index after the reciprocal transformation.)

The study uses the absolute distance method to deal with the intermediate indexes, that is, calculating the absolute distance between each decision value and the fitness value, and then

normalizing the reciprocal. In the formula, X_{ij} is the initial value, X'_{ij} is the same trending value, μ is the mean or median of the normal value, or an artificially set fitness value, and a is a constant to avoid the situation where the denominator is 0. The normalization method adopts the vector normalization method commonly used in the TOPSIS method.

$$X''_{ij} = \frac{1}{|X_{ij} - \mu| + a} \dots\dots\dots(4.8)$$

$$a_{ij} = \frac{X''_{ij}}{\sqrt{\sum X''_{ij}^2}} \dots\dots\dots(4.9)$$

After processing the data through the above steps, this study can obtain the ranking of six hospitals, and the ranking in descending order is as follows. See Table 4.9.

Table 4.9 Ranking of ten hospitals by using the weighted TOPSIS method

Hospital	D_i^+	D_i^-	C_i	Ranking
H1	4.345	6.836	0.611	1
H2	3.948	3.693	0.483	3
H3	4.221	3.131	0.426	4
H4	4.353	2.892	0.399	5
H5	4.039	2.328	0.366	6
H6	4.224	5.175	0.551	2

4.3.3.3 Correlation analysis of comprehensive evaluation results

Based on the above three comprehensive evaluation methods of Spearman's rank correlation analysis, the ranking results of the green hospital comprehensive scoring model established in this study are not completely consistent with those of the two commonly used comprehensive evaluation methods, the weighted TOPSIS method and the weighted rank-sum ratio method. By adopting the Spearman rank correlation analysis to analyze the ranking results of the above three methods, the author gets the results that the correlation coefficients of comprehensive scoring model and national performance ranking (2018), comprehensive scoring model and weighted TOPSIS method, national performance ranking (2018) and weighted TOPSIS method are 0.829, 0.829 and 0.886 respectively, with P smaller than 0.05 and the correlation coefficients larger than 0.8. It can be assumed that the ranking results of the three methods are positively correlated. The comprehensive evaluation model of the core competencies of maternal & child healthcare hospitals established in this study is scientific and accurate to some extent, and it has reference value for the evaluation of core competencies of maternal & child healthcare hospitals. See Table 4.10 and Table 4.11.

Table 4.10 Ranking of ten hospitals by using three comprehensive evaluation methods

Hospitals	Composite grade method	National performance ranking	Weighted TOPSIS method
H1	1	1	1
H2	3	4	3
H3	5	3	4
H4	6	6	5
H5	4	5	6
H6	2	2	2

Table 4.11 Correlation of the ranking of three comprehensive evaluation methods

Evaluation method	Composite grade method		National performance ranking		Weighted TOPSIS method	
	<i>r</i>	<i>P</i>	<i>r</i>	<i>P</i>	<i>r</i>	<i>P</i>
Composite grade method	1.000	—	0.829	0.042	0.829	0.042
National performance ranking	0.829	0.042	1.000	—	0.886	0.019
Weighted TOPSIS method	0.829	0.042	0.886	0.019	1.000	—

4.4 Summary

Experts invited in this study have high authority in the evaluation of core competencies of maternal and child healthcare hospitals. The evaluation index system takes human resources, information resources, resources of social relation, capacity of strategic management, technological innovative capabilities, capacity of medical service, capacity of district management and hospital culture as the first-level indicators.

The scoring results of the model established in this study can discriminate superiority from inferiority after ranking six maternal and child healthcare hospitals. Through the correlation analysis of the evaluation results with national performance and weighted TOPSIS method, the comprehensive score ranking of the model constructed in this study is positively correlated with the hospital ranking of national performance appraisal and positively correlated with the weighted TOPSIS method ranking. The ranking results of this model are suitable for the comprehensive strength of the institutions themselves, which is scientific to a certain extent.

The establishment of the evaluation index system of core competencies of maternal & child healthcare hospitals is not only aimed at getting the ranking results, but also to sort out the key elements of the core competencies of maternal & child healthcare hospitals, and to explore the methods of identification, evaluation, acquisition and promotion of key elements, which is the

integration of process and results, and this will be used to provide guiding framework for the formulation of personalized strategy for maternal & child healthcare hospitals.

[This page is deliberately left blank.]

Chapter 5: Case Study

Taking SD Maternal and Child Healthcare Hospital as an example and guided by the core competitiveness evaluation index system of China's maternal and child healthcare hospitals constructed in this study, SWOT analysis was carried out on SD Maternal and Child Healthcare Hospital, combined with the analysis results of questionnaire surveys, round-table conferences, and 10-year data review to put forward a development strategy for cultivating and enhancing the core competitiveness of the Hospital to answer Research Question 3;

The core competitiveness factors affecting the development of SD Maternal and Child Healthcare Hospital in the past 10 years were analyzed to explore the important role of improving the core competitiveness of maternal and child healthcare hospitals to answer Research Question 4.

5.1 Survey results of staff of SD Maternal and Child Healthcare Hospital

In order to identify the problems of hospital strategic management, a questionnaire survey was conducted among hospital employees, and a total of 250 closed questionnaires and 28 development questionnaires were issued. The strategy questionnaire mainly focuses on five aspects for analysis: hospital culture, strengths and weaknesses of the hospital, opportunities and threats of the hospital, awareness of hospital specialties, as well as future planning and the prospect of the hospital (See Annex I Table i.4 for analysis results).

5.2 Survey results of customer demand of SD Maternal and Child

Healthcare Hospital

To better understand the public's medical needs and their views on the current market competitive position of SD Maternal and Child Healthcare Hospital so as to determine the content of its market competitive strategy, the market demand questionnaire of SD Maternal and Child Healthcare Hospital in Foshan City was conducted on the spot. It consists of 18 closed questions, which are divided into five basic information questions and 13 demand

information questions. A total of 300 questionnaires were sent out and 300 were effectively recovered with a recovery rate of 100%.

Respondents include 32 males (10.7%) and 268 females (89.3%). There are 196 respondents (65.33%) from Shunde District and 104 respondents (34.67%) from the non-Shunde District. About 165 of the respondents aged from 21 to 30 years old, accounting for 55% of the total. Fifty-three respondents (17.7%) went to SD Maternal and Child Healthcare Hospital for the first time and the other 247 respondents (82.3%) had been to SD Maternal and Child Healthcare Hospital more than 2 times. The gender, origin, and age of the respondents are representative, all of whom are the patients of the Hospital, and hence the survey results are representative (See Annex I Table i.5 for analysis results).

5.3 Round-table conferences

In order to discuss in depth how the SD Maternal and Child Healthcare Hospital can improve its core competitiveness and answer Research Question 3, this research adopts the form of round-table conferences to organize discussions and surveys among middle-level and senior managers and employee representatives of the hospital. The staff representatives are those with over 5-year working experience in the hospital, who are all middle-level and above department business backbone. The round-table conferences will be conducted with 6 or 8 persons as a group, a total of 4 groups with 30 experts and topics principally include: SD Maternal and Child Healthcare Hospital's brand status, strengths and weaknesses compared with surrounding areas, current development opportunities, competition and threats, key factors for future development and others. The top three elements mentioned most frequently in each topic are as follows, See Table 5.1.

Table 5.1 The results of round-table conferences

Factors	Rate
Strengths	
Long history and good reputation	28
Advantageous specialized disciplines	25
Strong social awareness	19
Weaknesses	
The hospital's awareness of refined management is not strong (cost management, customer management)	30
Specialty brands have insufficient influence and an integrated medical service system has not been established	24
Insufficient research and teaching ability of employees and their learning enthusiasm needs to be improved	22
Opportunities	

The openness of national "second-child" policy	28
Comprehensive medical insurance network and strengthening public awareness of medicare	25
Guangdong, Hong Kong and Macao development and planning accelerating medical development	20
Threats	
Surrounding hospitals surpass with rapid development and competitiveness	25
Human resources competition pressure	24
Swift technological development	20
Key development factors	
New Hospitals construction	29
Learning-type hospital construction	27
Human resources reserve and inter-disciplinary collaborative development	22

5.4 Analysis of key factors behind the development of SD Maternal and Child Healthcare Hospital in the past 10 years

Based on the comprehensive evaluation index system developed in this research, index data of SD Maternal and Child Healthcare Hospital in the past 10 years (2010-2019) is collected, scored and ranked. The discussion of the score and ranking is expected to find core competency indices that cause change in competitive advantage. Hospital planning or strategy that causes the index or this type of index to change can guide the formulation of the SD Maternal and Child Healthcare Hospital to enhance the core competency strategy, and find out the influence of core competitiveness on hospital development so as to answer Research Question 3 & 4.

5.4.1 Operation status of SD Maternal and Child Healthcare Hospital from 2010 to 2019

(1) Hospital total revenue and balance rate

The total revenue of the hospital has continued to grow during the time span. The total revenue in 2019 is 2.6 times that of 2010, and the average growth rate in the 10 years stands at 11.5%.

In August 2010, the Division of Reproductive Medicine officially opened for operation, and the revenue growth rate of that year was 13.18%;

In 2013, changes occurred in the hospital management, resulting in the maintenance of daily business management to the exclusion of anything else. The revenue growth rate stood only 2.3%, the lowest growth rate in 10 years;

In 2014, the hospital adjusted the layout of some inpatient departments, and increased the number of inpatient beds from 350 to 400. Revenue rose by 4.45%;

In 2016, China implemented two-child fertility policy for couples where either the husband or the wife is from a single-child family, and in 2017, the “universal two-child” policy was formulated. The growth rate of total income in these two years was 18.64% and 18.79% respectively;

In 2019, due to the impact of hospital acquired infection incidents in its main competing hospitals, most patients chose to transfer to the hospital. The total medical revenue that year exceeded 400 million, an increase of 19.48%.

In the past 10 years, the hospital has been operating in an orderly manner, with an average annual balance rate of 5.2%, and the highest being 9.02% in 2011 while the lowest being 1.64% in 2013. A sustainable operation was achieved and a public hospital business strategy with slight surplus was proved (see Figure j.5).

(2) Hospital business

- **Outpatient service**

Throughout the ten years, the hospital has continuously expanded its outpatient services, adding Division of Reproductive Medicine, Division of Gynecology, Division of Internal Medicine, Division of Traditional Chinese Medicine and other outpatient divisions. The hospital integrated resources to merge with the district family planning center and added an outpatient division in November 2017. The number of outpatients increased from 585,400 in 2010 to 934,800 in 2019, with an increase of 59.7% and an average annual growth rate of 6%.

Outpatient revenue climbed from 88 million yuan in 2010 to 225 million yuan in 2019, an increase of 155%, with an average annual growth rate of 11% (see Figure j.6).

- **Hospitalization service**

Over the past ten years, the hospital's Division of Neonatology, Developmental Pediatrics Division, Surgery, and Obstetrics have been rated as district-level key specialties, demonstrating the improvement in medical technology level.

The number of discharges surged from 18,500 in 2010 to 26,900 in 2019, a growth rate of 45%. The ten-year average annual growth rate was 5.63%.

Among them, the average annual growth rate was only 4% in the first five years (2010-2014) due to limited beds and technical level.

In the next five years (2015-2019), as the number of beds has been increased and the level of medical technology and services has been improved, the average annual growth rate reached 8.15%.

Hospitalization revenue increased from 79 million yuan in 2010 to 198 million yuan in 2019, an increase of 151%, with an average annual growth rate of 11.53% (see Figure j.7).

5.4.2 Patient and employee satisfaction

From 2010 to 2019, the patient satisfaction level towards SD Maternal and Child Healthcare Hospital continued to be above 80%. Especially in the past five years, since the hospital is committed to improving the sense of belonging of employees and offering “patient first” services through promoting a sense of “home” culture, the satisfaction level of patients remains at the top three and that of employees ranks first in the district in the past five years (See Table 5.2).

Table 5.2 Third-party satisfaction survey of public hospitals in Shunde District, Guangdong Province

Year	Score from employees	The ranking of Shunde District	Score from patients	The ranking of Shunde District
2010	80.52	2	81.25	3
2011	79.81	3	83.24	4
2012	70.54	4	80.24	4
2013	66.51	3	80.48	5
2014	64.84	4	81.62	4
2015	85.38	1	87.29	2
2016	80.70	1	87.91	3
2017	77.71	1	88.62	3
2018	79.51	1	89.62	2
2019	77.56	1	87.4	2

Source: Shunde District Health Administration

5.4.3 Analysis of core competencies of SD Maternal and Child Healthcare Hospital in the past 10 years

In the thesis, the competitive advantage of SD Maternal and Child Healthcare Hospital is defined as being able to attract more customers to achieve higher economic benefits (surplus profits), and to achieve higher social benefits (employee, and patient satisfaction). If the number of people receiving hospital services (inpatient service visits, outpatient service visits) continues to grow, and the satisfaction of customers and employees increase, the hospital is considered to have a competitive advantage. Therefore, this study aims to discover the core competency elements that enhance the competitive advantages of SD Maternal and Child Healthcare Hospital by fully exploring problems encountered in the process of obtaining competitive advantages. By analyzing the data of SD Maternal and Child Healthcare Hospital in the past 10 years, we have discussed the hospital's decision and investment this decade (See Table 5.3).

Table 5.3 Analysis of core competency elements of SD Maternal and Child Healthcare Hospital from 2010 to 2019

Year	Decision/Fact	Reasons/Objectives	Impact on actual capabilities	Strategy to improve core competencies
2010	“Guangdong Provincial Prenatal Diagnosis Institution, and Neonatal Disease Screening Institution” were approved for registration, and the Children’s Hospital was independently built and opened.	Establishing the only specialized diagnosis and treatment platform in Shunde District to promote the development of pediatrics sub-specialty	Enhancing pediatrics and obstetrics specialty brand and regional influence	Access to heterogeneous resources
2010	Division of Pediatrics, Division of Neonatology, Division of Obstetrics, Developmental Pediatrics Division became key specialities of Shunde District	Key specialties establishment and development	Establishing regional speciality authority	Enhancing dynamic capabilities
2011	Grade-A tertiary maternal and child Healthcare hospitals passed the national review	Further development to increase demands of hospitals	Upgrading hospital level to Comprehensive improve the overall strength of hospitals	Enhancing dynamic Capabilities
2012	Approved by the Department of Health of Guangdong Province to carry out in-vitro-fertilization (IVF) and its derived technology. Reproductive IVF technology passed the national review	Filling the gap in Shunde’s reproductive specialty	The IVF technology can be officially launched to benefit the citizens in Shunde District	Enhancing dynamic capabilities
2013	Clean and honest administration was not carried out by hospital management, and main administrators including president and some of the vice presidents were changed.	Hospital development was severely damaged.	Staff morale and culture were seriously affected	Hospital culture and dynamic capabilities were hit severely
2015	The arrival of new president who established a “home culture” with the core theme of care. The new performance appraisal program was widely applied.	Conducting cultural guidance for the hospital’s low morale and lack of solidity, and improve the enthusiasm of employees in an all-round way	The initial establishment of the “home culture” featuring hospital care and promotion of the hospital’s business development capabilities	The establishment of a unique hospital culture
2015	Hospital HIS, LIS, PACS, HERP and WeChat service platforms went online fully.	Improve the level of hospital intelligence and information	The improved informatization boosts hospital service capabilities	Enhancing dynamic capabilities

Year	Decision/Fact	Reasons/Objectives	Impact on actual capabilities	Strategy to improve core competencies
2016	The hospital was rated as "Post-Abortion Care (PAC) Quality Service Hospital" Signing contract with Ren Ai Charity Foundation for Poor Newborns Funding Project The Taiwan Merchant Association "Little Angels Aid Fund" project was launched	Improving service for groups having induced abortion Supporting poor children with cerebral palsy Helping poor hospitalized children	Relieving family pressure on poor patients The deepening of "home culture" care	The building of hospital culture
2017	Foshan's key (characteristic) specialties (Pediatrics, Reproductive Medicine, Gastroenterology) were approved for registration.	Improving the regional level of Pediatrics, Reproductive Medicine, and Gastroenterology	Further establishing the specialty brand	Access to heterogeneous resources
2017	Signing the Connotation development project with HCM Consulting Company and the "Hospital Full-Staff Training Project for Quality Service" with Shanghai Yueyi Enterprise Management Consulting Co., Ltd.	Standardizing the Internal quality management of the hospital Cultivating a Group of excellent hospital internal trainers and improve quality services	Improving Hospital quality management level and hospital service culture, and establish hospital Service brand	Enhancing Dynamic capabilities and Establishing service culture
2017	Becoming Women and children's hospital affiliated to Guangdong Medical University	The government proposed a strategy for cooperation between government and school	Relying on the high-quality resources of the university to improve the hospital's medical, teaching and research level	Improving dynamic capabilities while acquiring heterogeneous resources
2018	The application passed the Shunde District Obstetrics Quality Control Center and Pediatrics Medical Quality Control Center, the Pediatric Intensive Medicine Department was opened, and the Pediatric Respiratory Department and Gastroenterology Department were established.	Enhancing the influence of specialties in the region and improving the ability to treat critically ill patients	Increasing hospital quality management awareness and enhancing specialty brand	Improving dynamic capabilities while acquiring heterogeneous resources
2018	The hospital organized the advanced training classes for postgraduate students to establish a pool of reserve talents and tutors of the hospital	Improving the academic qualifications of medical staff and cultivate reserve talents	Hospital talent echelon can be established	Enhancing dynamic capabilities

Year	Decision/Fact	Reasons/Objectives	Impact on actual capabilities	Strategy to improve core competencies
2018	Smart hospital self-service project was launched. The establishment of "Foshan City Smart (Network) Hospital and Smart Nursing Hospital Demonstration Unit"	Intelligent information empowered service	Realizing zero queuing in outpatient clinics, Intelligent nursing brand is improved	Enhancing dynamic capabilities
2019	Research Institute for Maternal and Child Health of Shunde Women and Children's Hospital affiliated to Guangdong Medical University was approved for registration.	Making up for the shortcomings of The hospital's low scientific research level	Establishing a scientific research Platform to improve the research level of women and children	Enhancing dynamic Capabilities
2019	Establishing the Institute of Children's Blood Research and the Institute of Respiratory Diseases for Children, and introducing a team of children's blood disease experts including Professor Chen Riling, Ma Guoda, Guo Runming and others.	High-quality talents drove the development of disciplines	Comprehensive paediatric service Capabilities were further strengthened	Obtaining heterogeneous Resources
2019	Purchasing large-scale MRI equipment	Promoting the development of hospital pediatric neurology and fetal medicine	Further developing disciplines	Obtaining heterogeneous resources

Source: Hospital volunteers of SD Maternal and Child Healthcare Hospital

5.5 SW analysis: internal resources, capabilities, dynamic capabilities and cultural analysis of SD Maternal and Child Healthcare Hospital

SD Maternal and Child Healthcare Hospital is the only third-grade class-A MCH hospital in Shunde District of Foshan City, Guangdong that integrates medical treatment, health care, prevention, scientific research and teaching, which has 500 beds and is the jurisdictional Maternal and Child Healthcare Technical Guidance Center, Obstetric Quality Control Center, Critical Maternal Treatment Center, Pediatric Medical Quality Control Center, Neonatal Emergency Center, Scientific Parenting Guidance Center, Prenatal Diagnosis and Screening Center, Newborn Disease Screening Center, and Birth Defect Intervention Center. This Hospital is held responsible for the rescue work of critically ill patients in the departments of obstetrics and gynecology and neonatology of all towns in the district and is the only hospital

in Shunde that has been approved by the Guangdong Provincial Health and Family Planning Commission to carry out human assisted reproduction (test-tube baby) technology.

The medical equipment is worth more than 200 million yuan, and the key medical equipment includes: a GE1.5T MRI machine, a Philips Brilliance Big Bore 16-Slice CT scanner, an oral panoramic CT scanner, two mobile DR machines, a high-frequency gastrointestinal X-ray machine, a medical X-ray examination vehicle, an X-ray imaging system, 32 doppler ultrasonographic machines, an immunohistochemical instrument, a liquid-based cell detector, two sets of laparoscopic systems, one set of hysteroscopic systems, 29 ventilators, three colposcopes, electronic laryngoscopes, bronchoscope systems. Specifically, 1,451 medical devices are worth over 10,000 yuan; 132 medical devices are of over 300,000-yuan value; 75 medical devices more than 500,000 yuan.

By referring to the results of questionnaire surveys of staff and customers and round-table conferences, combined with the hospital's financial statements, annual audit reports, human resources report, and other internal data from the hospital's investigations, the study classified and determined such elements of core competitiveness of SD Maternal and Child Healthcare Hospital as internal resources, capabilities, dynamic capabilities, and culture as follows:

5.5.1 Human resources

There are currently 5 leaders in the hospital, encompassing 1 party secretary, 1 dean, 1 deputy secretary, and 2 deputy deans. There is a total of 812 hospital staff in the Hospital, among which 708 healthcare are technicians, accounting for 87.2% of the staff. The structure of the professional title can be listed as below: 142 senior titles (17.5%), 260 intermediate titles (32.0%), and 340 junior titles (41.9%). The structure of the educational background correspondingly stands as 60 with a master's degree or above (7.4%), 596 with a bachelor's degree (73.4%), and 155 with a bachelor's degree or below (19.1%). There are 58 full-time managerial staff, accounting for 7.1% of the staff, including 33 doctors (56.9%), 20 nurses (34.5%), 3 medical technicians (5.2%), and 2 pharmaceutical workers (3.4%).

The results of the round-table conferences disclose that 80.0% of managers believe that there is fierce competition for talents in surrounding hospitals, and 73.3% uphold that hospital staff have insufficient scientific research and teaching capabilities, and their learning enthusiasm needs to be improved. 90.0% of managers reckon that it is urgent to establish learning hospitals, and 73.3% hold that it is necessary to strengthen the training and introduction of hospital talents. In addition, 66.7% of the respondents believed that the hospital

decision-makers did not have a strong sense of innovation, did not take many innovative management measures, did not pay attention to the hospital operation and customer management, and did not have a deep understanding of the hospital development strategy management.

5.5.2 Information construction

The Hospital has built a medical information system with the electronic medical record (EMRs) as the core by using the integrated platform, with more than 50 subsystems, including Hospital Information System (HIS), HERP, surgical anesthesia system, mobile nursing system, WeChat clinic platform, self-service terminal system and more. Based on this, a data interface has been standardized to realize data connectivity and data sharing among various systems through the integrated platform.

In-hospital surveys show that the application function level of hospital electronic medical records, the hierarchical smart medical information system, the maturity of information inter-connectivity and standardization, and the level of information system security are all at the middle or lower level.

5.5.3 Social relations resources

In 2017, according to the strategy of “government-school cooperation” put forward by the Shunde District Government, the Hospital carried out cooperation with GDMU. From then on, hospital teaching and scientific research took their fast track of development. In 2018, the Research Institute for Maternal and Child Health and Institute of Respiratory Diseases for Children were successively established, equipped with high-end scientific research equipment. At present, the hospital research team is composed of one doctoral supervisor, 6 postgraduate supervisor, four professors, three associate professors, and 40 part-time professors and associate professors. The team presides over one National Natural Science Foundation and more than ten provincial and ministerial projects.

According to the analysis of the source composition of patients in SD Maternal and Child Healthcare Hospital in 2019, the results show that most patients are from Guangdong Province (87.24%), and the rest are from neighboring provinces (12.76%), with more than 100,000 patients traveling from different places for medical treatment, basically equal to hospitals of the same level (Annex I Table i.1).

The results of the customer questionnaire survey demonstrated: **(1) Willingness to choose SD Maternal and Child Healthcare Hospital:** 84.3% of the survey respondents regard SD Maternal and Child Healthcare Hospital as the preferred hospital for women and children with common diseases. 67.7% of them regard SD Maternal and Child Healthcare Hospital as the first option for women and children with special or major diseases. **(2) Reasons for choosing SD Maternal and Child Healthcare Hospital: The first three reasons are** good reputation of the hospital (75.0%), recommendations by relatives and friends (45.7%), and familiar and trusted doctors (39%); the four factors emphasized by SD Maternal and Child Healthcare Hospital are: favorable medical technology (64.3%), good service attitude (64.0%), the hospital's reputation (62.7%), and the convenience of medical treatment (51.7%); the top five factors most valued in the medical treatment process are: medical safety (80.0%), pain relief (64.0%), rational use of medicines and inspections (61.3%), informed consent to the diagnosis and treatment plan (59.3%), and good services (52.3%).

5.5.4 Strategic management capabilities

SD Maternal and Child Healthcare Hospital has a clear organizational structure, complete management functions, and clear division of functions among various departments. The Hospital has formulated a five-year and ten-year plan, set development goals, a sound talent introduction and performance incentive system. The functions of medical management, quality management and logistical service guarantee are gradually being strengthened, and the discipline construction level is at a medium level, with 3 municipal key specialties.

In November 2011, SD Maternal and Child Healthcare Hospital was evaluated as one of the first grade-A tertiary maternal and child healthcare centers in China. Patient-centered, it has established well-defined processes and regulations for its overall quality management objectives to ensure all medical services are subject to quality control, following the management concept of Plan-Do-Check-Act (PDCA) cycle. As a whole, the operation of the Hospital followed the pattern of plan, implementation, inspection, and summary for continuous improvement. From August 2016 to June 2020, it carried out special management and governance over the medical quality management system and quality services, which effectively improved its management level.

The results of questionnaire surveys of staff reveal: **(1) SD Maternal and Child Healthcare Hospital's strategic management awareness:** 49.0% of the staff set clear individual work goals each year, 69.8% are clear about the hospital's development goals for

the next three years, and 72.8% clearly expressed the hospital's annual work goals, 87.5% said they were clear about their departments' annual work goals, and 30% noted that their superiors often discuss how to improve work performance. **(2) Recommendations for SD Maternal and Child Healthcare Hospital's strategic management:** the current top three advantages of the hospital are: services (60.0%), technology (46.0%), brand image (40.0%); the top three disadvantages of the hospital currently are: geographic location (68.4%), equipment (42.4%), talents (32.8%); the top three tasks that need to be strengthened in hospitals are: improving the level of medical technology (70.4%), introducing modern medical equipment (52.8%), training and introducing excellent professional and technical personnel (53.2%); the top three common negative items in the hospitals are: lack of marketing awareness of staff, lack of standardized customer management, and difficulties in meeting customer needs (41.6%); lack of cost concepts and poor operational efficiency management (29.2%); there are many meetings, but no obvious effect is seen and many tasks are arranged but not implemented (23.6%).

The results from the round-table conferences showcase that 80.0% of managers believe that hospitals have a weak awareness of refined management, especially in hospital operation management and customer refined management services that still need to be strengthened.

5.5.5 Technological innovative capabilities

In 2017, SD Maternal and Child Healthcare Hospital became an affiliated hospital of Guangdong Medical University. Based on the cooperation between governments and universities, it has greatly improved the level of teaching and research and the supporting funding of research, education and training have increased year by year. The funding for scientific research projects for healthcare and technical personnel, the number of core journal articles, and SCI articles and the number of new technology businesses have elevated significantly. On the basis of continuous improvement of scientific research and teaching, the level of medical treatment has also achieved mutual benefit in teaching, and the capabilities to innovate in technical services have gradually been enhanced.

The results of the round-table conferences demonstrated that 80.0% of managers think that an integrated medical service system has not been established and the ever-increasing demand for maternal and child healthcare failed to be met.

5.5.6 Medical services capabilities

According to the analysis of the composition of outpatient etiology, hospitalization etiology, and death etiology in HIS system of SD Maternal and Child Healthcare Hospital, the results show that it mainly provides diagnosis and treatment for frequently-occurring and common diseases of women, children, and newborns. Combined with the top three outpatient etiology and hospitalization etiology structure, it can be found that respiratory diseases and pregnancy-related routine diagnosis and treatment account for a large proportion, and its capability to provide diagnosis and treatment for complicated and severe diseases needs to be further improved (Annex I Table i.2).

In accordance with the analysis of the age distribution of patients in SD Maternal and Child Healthcare Hospital, the results show that the ratio of male to female patients is 1:1.82, the proportion of female patients is 64.52%, among which 56.07% are adolescents and children under 14 years old. Its distribution of gender and age of patients is in line with its functional characteristics: mainly provide diagnosis and treatment for women and children (Annex I Table i.3).

The results of questionnaire surveys of customers unveil that 67.7% of them regard SD Maternal and Child Healthcare Hospital as the first choice for women and children with special or severe diseases, indicating that the hospital's capability to treat difficult and severe diseases still needs to be strengthened.

5.5.7 Jurisdictional management capabilities

SD Maternal and Child Health Hospital re-adjusted the four major business departments of the hospital in 2017, and established three major business departments: the Department of Maternal and Child Health, the Department of Maternal Health, and the Department of Child Healthcare. The responsibilities of each business department cover the responsibilities of hospital health and clinical work of the people served as well as the jurisdictional management responsibilities. The maternal mortality rate in the jurisdiction is less than 18 per 100,000, the infant mortality rate is less than 7.5‰, the maternal system management rate is higher than 85%, the coverage of pre-pregnancy eugenics examinations for the target population is as high as 80%, and the rate of neonatal genetic and metabolic diseases screening in the jurisdiction is as high as 90%.

The results of the round-table show that 66.7% of hospital managers mentioned that the hospital's management network of regional maternal and child healthcare has not been

perfected, and the regional maternal and child healthcare business coordination has failed to integrate with the Hospital's business.

5.5.8 Hospital culture

SD Maternal and Child Healthcare Hospital takes "family culture" as its core and carries out cultural construction from multiple levels of system, process, and philosophy. It has a unified hospital emblem, hospital flag, hospital logo, hospital song, and hospital uniforms, conducts regular high-quality service culture training, establishes quality service departments, formulates quality service systems, and carries out quality service evaluation standards. The Hospital has set up hospital humanities lectures and trains for the hospital's core values, hospital mission, and development vision so as to improve staff cohesion. It also pays attention to hospital brand promotion with provincial and above media promotion, and its monthly maximum reading volume surpasses 30,000. In 2019, employee satisfaction was up to 77.59%.

The results of the questionnaire surveys of staff displayed that the cultural awareness of SD Maternal and Child Healthcare Hospital is that 21.7% of them did not know that the hospital has values, and 22.0% did not know the hospital's spirit.

The results of the round-table conferences showcased that 66.7% of hospital managers uphold that the awareness of active service of medical staff needs to be strengthened, and 60% of them think that the awareness of hospital innovation management needs to be strengthened.

5.5.9 SW analysis summary of SD Maternal and Child Healthcare Hospital

5.5.9.1 Advantages of SD Maternal and Child Healthcare Hospital (S)

- It is the only local top third-grade class-A maternal and child healthcare hospital.
- It has a clear organizational structure, complete management functions and clear-cut division of labor.
- Its medical quality management system and quality service management system are comparatively complete.
- Its medical radiation capabilities are acceptable, and the patient structure stays in line with the functional characteristics of the hospital.
- Its caring service culture has been initially established.

5.5.9.2 Weaknesses of SD Maternal and Child Healthcare Hospital (W)

- From the perspective of scarce resources: it has insufficient development space, a lack of outstanding academic advantages, insufficient high-end talents, and weak awareness of the overall improvement of medical education and research.

- From the perspective of organizational ability: it displays that the hospital's capabilities to treat difficult and severe cases still need to be strengthened; the concept of customer relationship management has not been built up; the hospital's management is extensive with high operating cost, and the benefits of operation management have more room for improvements; the awareness of co-construction and coordinated development is also insufficient, the regional maternal and child healthcare management network has not been perfected; the regional maternal and child medical and healthcare business coordination has not been integrated with the hospital business.

- From the perspective of dynamic capabilities: staff have insufficient scientific research and teaching capabilities, and their enthusiasm for learning has to be improved; hospital managers and staff have insufficient awareness of crisis and competition, and there are not many innovations and reforms around the hospital's reform and development; in terms of the innovative development mode, the diversified expansion channels have not performed well enough, and the resources and platforms of universities have not been fully exploited. The service mode has failed to be updated in time and the integrated medical service system has not been established yet.

- From the perspective of hospital culture: the top-level design is not favorable enough and the core values of the hospital as well as the overall vision and goals of the development are not clear; the active service consciousness of medical staff needs to be strengthened, and their awareness of learning and innovation needs to be reinforced, too.

5.6 OT analysis: PESTEL analysis of SD Maternal and Child Healthcare

Hospital

PESTEL analysis model, also known as macro-environment analysis, is an effective framework tool not only for the analysis of the external environment, but also identification of all factors that have a knock-on effect on the organizations. It is a method to investigate the

external influencing factors of an organization. Each of the six letters represents a factor respectively: Political, economic, social, technological, environmental, and legal.

5.6.1 Political factors

In September 2015, 17 sustainable development goals were officially proposed at the United Nations Summit on Sustainable Development. Goal 3 is to “ensure healthy lives and promote well-being for all at all ages”. The awareness of healthy lives and access to quality medical and healthcare services gets globally recognized and further improved.

5.6.1.1 National policy environment

(1) Healthy China strategy

In 2016, the National Health and Fitness Conference called for speeding up the building of a healthy China. In the same year, the State Council issued the *Healthy China 2030 Planning Outline*. In March 2018, the First Session of the 13th National People's Congress of China proposed to promote the implementation of Healthy China strategy, establish the concept of grand health and massive health, and shift the focus from treating illnesses to enhancing people's health. In 2018, China formulated and issued the *Notice on Printing and Issuing the Plan for Maternal and Infant Safety (2018-2020)* and the *Action Plan for Healthy Children (2018-2020)*. The two *Action Plans* aim to implement the requirements of the *Healthy China 2030 Planning Outline* and further ensure the safety of mothers and infants and children's health.

(2) “Universal two-child” policy

In 2016, the “universal two-child” policy embraced its full relaxation and tapped the strong demand of age-appropriate married and child-bearing women for premarital check-up, birth check-up, maternal care and recovery, which brought great development opportunities to China's high-level specialized hospitals for women and children.

(3) China's new medical reform

China's new medical reform focuses on five basic medical and healthcare systems to form the linkage of medical care, medical insurance, and medicine. It makes clear the establishment and improvement of the modern hospital management system, deepens the reform of medical service price and breaks the mechanism of compensating medical costs with drug-selling profits.

Comprehensive reform of public hospitals: To promote the comprehensive reform of public hospitals, the proportion of government healthcare investment has increased year by

year. After the cancellation of drug bonuses, the focus of state owned hospitals is placed on reducing burden, boosting development trend, improving medical and healthcare standards so as to provide better services.

(4) Pediatric medical service policy

In May 2016, the National Health and Family Planning Commission, the National Development and Reform Commission, and the other six departments jointly issued the *Opinions on Strengthening the Reform of Children's Medical and Health Services*. According to the *Opinions*, medical services such as invasive biopsy and exploration in children's clinical diagnosis and clinical surgical treatment that can reflect the characteristics and value of pediatric medical personnel's technical services shall be charged higher than adult medical services and shall be subject to an additional policy of no more than 30%, which shall be included in the coverage of medical insurance based on regulations. The *Opinions* also requires that the remuneration of pediatric medical staff be improved. During the internal distribution within medical institutions, it shall be given full consideration to the work characteristics of pediatrics to reasonably determine the wage level of pediatric medical staff, which shall not be lower than the average income level of the medical staff at the same level in this unit.

5.6.1.2 Provincial policy environment

(1) High-level hospital construction

In June 2018, the Guangdong government launched the "Summit Plan" for the construction of high-level hospitals and invested 6 billion yuan of provincial financial funds in the past three years. It is a must to build a number of domestic first-class and world-famous hospitals via resource integration, reform and innovation, and connotative development.

(2) Development of Guangdong-Hong Kong-Macao Greater Bay Area

The CPC Central Committee and the State Council issued the *Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area*. The *Outline* points out that we should foster close cooperation in quality medical and healthcare resources, support medical and healthcare service providers from Hong Kong and Macao to set up healthcare facilities through sole proprietorship, joint-venture, cooperation, and other cooperation forms in the nine PRD municipalities in accordance with regulations, and develop a regional healthcare cluster as well as regional medical centers.

5.6.1.3 Municipal policy environment

In January 2019, the *Opinion of Foshan Municipal People's Government Office on Implementing the "Summit Plan" for the Construction of High-level Hospitals* was officially issued. According to the *Opinion*, in order to improve the overall quality of medical service in Guangdong province, the Foshan government will allocate 1.6 billion yuan for the construction of government-run non-profit hospitals included in the "Summit Plan" and strive to build 10 national key specialized hospitals by 2022. At that time, in terms of comprehensive strength, these key hospitals will seek their way into the top 100 in China.

The *13th Five-Year Plan for the Development of Health and Family Planning in Foshan City* explicitly proposed the plan to increase the proportion of medical treatment in primary healthcare institutions (including grade II hospitals) and the proportion of primary healthcare institutions preferred by residents who fall ill within two weeks before seeking medical treatment; to promote the reform of public hospitals, abolish the markup on drug prices, and change hospital compensation methods. By 2018, two to four hospitals would join the list of provincial and regional medical centers; to implement hierarchical diagnosis and treatment and corresponding assessment standards. Since January 1, 2018, the Foshan government has carried out the pilot reform of the payment of basic medical insurance for inpatient medical expenses based on diagnosis-related groups (DRGS), which puts forward higher requirements for the refinement of hospital management.

The *13th Five-Year Development Plan for Health in Shunde District* pointed out that in order to deepen the reform of the medical and healthcare system, it's important to build up the leading benchmark of regional medical service via "government-school cooperation", establish eight medical treatment partnerships, and speed up the relocation and reconstruction of Shunde Traditional Chinese Medicine Hospital (TCM Hospital) and SD Maternal and Child Healthcare Hospital.

5.6.2 Economic factors

5.6.2.1 Sustainable growth in healthcare expenditure

In the past five years, China's economy has entered the fast lane. The total healthcare expenditure has increased significantly from 2016 to 2019, from 4,634.49 billion yuan to 6,519.59 billion yuan, with a growth rate of 10.2%. Specifically, government healthcare expenditure increased from 139.103 billion yuan to 1,742.85 billion yuan, up by 6.3%.

Moreover, government healthcare investment is continuing to climb up (China National Health Commission, 2019).

5.6.2.2 Economic development enhances healthcare awareness

In 2019, the GDP of Guangdong reached 10.77 trillion yuan, and that of Foshan 993.5 billion yuan. The development process of Guangdong-Hong Kong-Macao Greater Bay Area is in full swing. In 2019, Shunde District's GDP exceeded 350 billion yuan, ranking first among the top 100 comprehensive strength areas in China for eight consecutive years and came first among the top 100 green development areas in China for two consecutive years (China Business Information Network, 2020). The public's awareness of health is also getting similar with that in middle-income countries, which raises higher requirements for the effect, quality, and experience of medical health, and pays more attention to personalization and humanization. At the same time, people also have a stronger ability to pay and spend and are willing to devote more time, money, energy, and attention to the health of family members.

5.6.3 Social environment

5.6.3.1 Disease spectrum in China undergone significant changes with the aging population

China has become the country with the largest elderly population in the world as well as the highest aging rate. The population aged 60 and above accounts for 10.3% of the total in China. Experts have postulated that by 2020, the number of elderly people over 65 years old in China will account for 12.3% of the total, and climb up to 16.9% in 2030, making it the most aging country in the world. With the aging population, China's disease spectrum has undergone significant changes, posing a greater challenge to the medical level, particularly the health of elderly women.

5.6.3.2 Quantity and quality of maternal and child healthcare services facing higher requirements due to “universal two-child” policy

The “universal two-child” policy has been implemented across China since January 1, 2016. Up to now, the policy has been in effect for more than four years. In 2016, the number of first-born-child birth was 9.73 million, and that of second-or-more-child birth reached 7.21 million with a significant increase exceeding 40.2%. Additionally, according to the statistics of the National Health and Family Planning Commission, about two-thirds of the people of

childbearing age who meet the “universal two-child” policy are women over 35 years old, clinically elderly parturient women.

In addition, the newly-added people meeting the birth policy have better economic conditions, higher education levels, and strong demands for maternal and child healthcare services. The higher proportion of elderly women and the considerable proportion of reproduction after the cesarean section increase the risk of complications during pregnancy and childbirth, which requires a higher quality of maternal and child healthcare services and management during the whole process.

5.6.3.3 Speeding up urbanization

Since Chinese economy has entered a new stage of development, its urbanization will shift from a high-speed growth to a medium-high-speed growth and its development will place equal emphasis on scale expansion and quality improvement. In 2020, China's urbanization rate reached 61%, and it is expected to reach 70% in 2030. Urbanization is a key driving force of modern economic growth. The concentration of population in big cities will bring about obvious scale effect, hence the demands in the medical market will rapidly grow and diversify, which will be a boon to the specialized division of labor. But the specialization of specialized hospitals in the medical field will also face greater challenges.

5.6.3.4 Increasingly serious sub-health

According to the survey results published by China Healthcare Association in July 2005, the proportion of citizens with “sub-health” in Beijing is 75.3%, that in Shanghai is 73.49%, and Guangdong 73.41%. The “sub-health” rate in the three areas is obviously higher than that in other regions, and the whole population in Guangdong is at a higher level of “sub-health,” and its medical needs such as prevention, healthcare, and rehabilitation are huge.

5.6.4 Technological environment

5.6.4.1 Internet + healthcare

The prevention and treatment of diseases in modern medicine largely depend on the diagnosis results of advanced medical equipment. The application of imaging and digital medical equipment and systems have become commonplace. With the development of computer and network technology, information management and digitization in the medical field become the development trend of medical management in the future, which will lead to an increase in the demand for high-quality, refined, and sophisticated medical equipment such as imaging and

digitization. The application of HIS, clinical information system (CIS), medical picture archiving and communication system (PACS), mobile medical workstation, and other technologies is the integration of the Internet and medical technology, which greatly facilitates the rapid development of the new medical model.

5.6.4.2 Regional health informatization construction

Progress has been made in the construction of regional health informatization in 2020, particularly in some developed cities. First, the primary problem of patients is solved by extending the use of citizen health cards, and then sharing transmittable information such as test results, medical expenses, medical advice, test reports, and objective course description. On this basis, personal health records can be preliminarily established for the mutual recognition of regular examination and test results between higher-level hospitals or hospitals at the same level, thus laying a good foundation for the comprehensive construction of regional health informatization.

5.6.4.3 Imperative trend of precision medicine with the rapid development of biotechnology

As a diagnosis and treatment model in the new era, precision medicine is a new means of disease prevention and treatment, which integrates the residents' genes, environment, lifestyle, and other variables. Biotechnology grows at a brisk pace, with gene sequencing and stem cell technologies introducing new diagnosis and treatment methods. For example, surgical robots allow diagnoses and treatment more non-invasive and precise. Advances in artificial intelligence, auxiliary diagnosis, 3D organ printing, gene sequencing, and robot-related technologies have also brought great convenience to hospital diagnosis and treatment and services. The analysis of big data in healthcare provides evidence-based information for individualized treatment. Significant improvement of medical efficiency and quality has been achieved through more and more targeted treatment.

5.6.5 Environmental factors

5.6.5.1 Status of medical institutions in Shunde

There are over ten towns and streets in Shunde District, with the population of permanent residents reaching 2,704,700, among which 48.96% are male, 1.95% under 18, 21.9% under 18, 61.3% aged 18-60, and 16.8% aged 60 and above.

As of October 2018, the number of medical and healthcare institutions in Shunde District increased from 22 in 1990 to 646; the total numbers of available beds and medical technicians both increased by 5.9 times. There are 17 general hospitals, 19 specialized hospitals, one maternal and child healthcare hospital, and one chronic disease prevention and control center in Shunde, with a total of 10,616 beds, of which 550 are prepared by SD Maternal and Child Healthcare Hospital, accounting for only 5.2% of the total.

5.6.5.2 Competitive environment

SD Maternal and Child Healthcare Hospital is facing fierce competition with neighboring hospitals of the same level. The Shunde Hospital of Southern Medical University (the First People's Hospital of Shunde) and the Affiliated Shunde Hospital of Jinan University (the Second People's Hospital of Shunde) have been put into use one after another since the hospitals have certain advantages due to their own scale, technology, brand, and geographical location. Also, some large-scale private medical institutions, such as New Rongqi Hospital, Tongjiang Hospital, Shunde Heping Surgical Hospital, and Guangzhou IBorn Women's & Children's Hospital, gradually extend their business to women and children healthcare and attract the patients in the surrounding areas with their special specialty advantages or high-quality services.

Shunde District is adjacent to Guangzhou and downtown Foshan. In these regions, Guangdong Women and Children Hospital, Foshan Women and Children Hospital, the First People's Hospital of Foshan, and Nanhai Maternal and Child Healthcare Hospital are all hospitals with a long history and strong abilities, which are far superior to SD Maternal and Child Healthcare Hospital in terms of scale, professional techniques, and the brand of the hospital. Due to convenient geographical conditions and medical habits developed before, people in Shunde prefer to choose hospitals with strong technical force in Guangzhou or Foshan nearby.

5.6.6 Legal factors

At present, there are 12 effective laws in the field of medical and healthcare in China, and a large number of administrative regulations, rules, and guidelines play a regulatory and normative role in maternal and children healthcare hospitals.

Maternal and child health institutions (MCH institutions) are professional in providing medical care services for women and children. In terms of the management of MCH institutions, the Chinese government has successively issued the *Guiding Opinions on Standardization*

Construction and Standardized Management of Maternal and Child Health Service Institutions, Guidelines for Setting Up Business Departments of Maternal and Child Healthcare Service Institutions at all Levels, Evaluation Standards for Tertiary and Secondary Maternal and Child Healthcare Hospitals (2016 Edition) and Its Implementation rules, clarified the functional orientation and responsibilities of MCH institutions under the new situation and promoted the construction of an integrated service model centered on women and children's health. The maternal and child healthcare service project is included in the planning outline of the national health guarantee project in the 13th Five-Year Plan, so that the provincial, municipal and county-level MCH institutions will be granted continuous support to meet the standards and improve their service conditions.

In 2019, the State Council of China issued the *Opinions on Strengthening the Performance Appraisal of Tertiary Public Hospitals*, which assessed the tertiary public hospitals nationwide from four dimensions (namely medical quality, sustainable development, satisfaction evaluation, operational efficiency) and 55 indicators. In July, 2020, *Notice on Printing and Distributing Measures for Performance Evaluation of Maternal and Child Healthcare Institutions* issued by the office of National Health Commission, clearly stated that the performance evaluation of MCH institutions should be strengthened to enhance the standardized construction and management of MCH institutions, promote the high-quality development of MCH institutions, improve the efficiency and quality of maternal and child healthcare services, and better safeguard the health rights and interests of women and children.

5.6.7 OT analysis summary of SD Maternal and Child Healthcare Hospital

5.6.7.1 Opportunities of SD Maternal and Child Healthcare Hospital

- The opening of “universal second-child” policy;
- Healthy China strategy and increasing awareness of active medical care;
- The increase of people's health awareness promoted by economic development, and the increasing demand and requirements for medical and healthcare services;
- The rapid development of Internet hospitals and smart medical care;
- The investment in the construction of new hospitals.

5.6.7.2 Threats of SD Maternal and Child Healthcare Hospital

- The surrounding hospitals developing rapidly and catching up with great forces, causing great competition pressure;
- Talent competition pressure;

- Canceling the medical reform policy of medicine markups;
- The sinking of medical resources, and the reduction in the number of visits caused by hierarchical diagnosis and treatment.

5.7 SWOT matrix analysis of SD Maternal and Child Healthcare Hospital

Through interviews, and questionnaire surveys of staff and customers, we summarize the competency elements of the hospital's successful development in the past 10 years. Combined with the current internal and external environments of SD Maternal and Child Healthcare Hospital, we adopt SWOT matrix analytical method to carry out analysis and propose the hospital's development strategy (See Figure 5.1).

Internal environment		Resources / Capabilities / culture	
		<p>S1: The only local third-grade class-A maternal and child healthcare hospital</p> <p>S2: Clear organizational structure, complete management functions, and clear-cut division of labor</p> <p>S3: The comparatively complete medical quality management system and quality service management system</p> <p>S4: The acceptable medical radiation capability and the compatible patient structure with the functional characteristics of the hospital</p> <p>S5: The initial establishment of hospital culture of caring</p>	<p>Weaknesses (W)</p> <p>W1: The proportion of personnel with high professional titles and high education is low</p> <p>W2: Medical staff are not well-motivated to learn, and the level of scientific research and teaching needs to be improved</p> <p>W3: There are not many management measures by hospital managers, and their innovation awareness is not strong</p> <p>W3: The service model has not been updated in time, and the integrated medical service model has not been established yet</p> <p>W4: The level of information construction is low</p> <p>W5: The operation management system has not been established, and refined management needs to be strengthened</p> <p>W6: The functions of marketing and customer service management are not fully utilized</p> <p>W7: Patient-oriented service culture and innovation awareness need to be reinforced</p>
<p>External environment</p>	<p>Opportunities (O)</p> <p>O1: The opening of "universal second-child" policy</p> <p>O2: Healthy China strategy and increasing awareness of active medical care</p>	<p>SO1. Building a new hospital</p> <p>SO2. Strengthening informatization construction and constructing smart hospitals</p> <p>SO3. Establishing hospitals' customer relationship management</p>	<p>(WO)</p> <p>WO1. Training of elite medical talents</p> <p>WO2. Cultivating and forging an excellent hospital management team</p> <p>WO3. Establishing a learning hospital</p> <p>WO4. Building a Maternal and Child Medical Center and</p>
<p>Political</p> <p>Economic</p> <p>Social</p>			

<p>Environment</p> <p>Law</p>	<p>awareness promoted by economic development, and the increasing demand and requirements for medical and <u>healthcare services</u></p> <p>O4: The rapid development of Internet hospitals and smart medical care</p> <p>O5: The investment in the construction of new hospitals</p>	<p>SO4 Developing new customer needs and establishing a marketing network</p>	<p>WO5. Setting up an integrated <u>healthcare service system</u></p> <p>WO6. Constructing a health management service chain for women and children throughout the life cycle</p>
	<p>Threat (T)</p> <p>T1: The surrounding hospitals developing rapidly and catching up with great forces, causing great competition pressure</p> <p>T2: Talent competition pressure</p> <p>T3: Canceling the medical reform policy of medicine markups</p> <p>T4: The sinking of medical resources, and the reduction in the number of visits caused by hierarchical diagnosis and treatment</p>	<p>(ST)</p> <p>ST1. Establishing a maternal and child research institute and scientific research platform to train talents and promote the development of disciplines</p> <p>ST2. Constructing a regional maternal and child medical and <u>healthcare alliance</u> to play a demonstrative and leading role, and enhance regional influence and radiation</p> <p>ST3. Building an Internet Maternal and Child <u>Healthcare Hospital</u> to realize online and offline linkage mechanism</p>	<p>(WT)</p> <p>WT1. A specialist operation department set up to build a new hospital management and operation system</p> <p>WT2. To promote hospitals' refined 5S management and full cost accounting management</p> <p>WT3. To create a distinctive discipline brand</p> <p>WT4. To establish a regional diagnosis and treatment center for maternal and children's rarely-seen and critical cases</p> <p>WT5. To build a value-oriented performance management system</p> <p>WT6. To improve a comprehensive, <u>multi-level</u> and <u>multi-dimensional</u> quality management system</p>

Figure 5.1 SWOT matrix analysis of SD Maternal and Child Healthcare Hospital

5.8 SD Maternal and Child Healthcare Hospital

5.8.1 Market positioning and strategic positioning

SD Maternal and Child Healthcare Hospital belongs to the county and district level Grade A tertiary maternal and child healthcare specialized hospitals, and its service coverage is basically fixed. The results of a questionnaire survey of 300 clients receiving service showed that 84.3% of the respondents regard SD Maternal and Child Healthcare Hospital as the first choice for the treatment of women and children general diseases. The brand building of hospitals has the greatest impact on patients' choice of hospitals. In the competition, the construction of specialties such as obstetrics and gynecology, and pediatrics is the advantage of SD Maternal and Child Healthcare Hospital. More clients position the development of SD Maternal and Child Healthcare Hospital as high-level maternal and child healthcare specialized hospitals.

Therefore, according to the opinions and suggestions of staff questionnaires and round-table conferences, for SD Maternal and Child Healthcare Hospital, compared with general hospitals, the clients and patients served by maternal and child healthcare hospitals are mainly women and children. As to strategy, the best choice is focus strategy.

There are two specific forms of focus strategy: one is focused cost strategy, which means seeking cost advantages in market segments; the other is focused differentiation strategy, which means searching for differentiated advantages in market segments. The competition of public medical institutions is mainly manifested in technical differences, service differences, discipline construction differences, and cultural differences. Therefore, this study takes focused differentiation strategy as the core of the development strategy of SD Maternal and Child Healthcare Hospital to enhance core competitiveness.

The results of the customer questionnaire survey demonstrated: **(1) Expectations for SD Maternal and Child Healthcare Hospital:** the main channels to know about SD Maternal and Child Healthcare Hospital are: health lectures (50.7%), free consultations (43.7%); the main aspects of SD Maternal and Child Healthcare Hospital to know about include: expert introduction (64.7%), treatment project introduction (64.7%), disease prevention and healthcare knowledge introduction (56.7%); the services hoped to be provided by SD Maternal and Child Healthcare Hospital are chiefly: making appointments to receive medical treatment (82.0%) and establishing personal health files (68.7%). **(2) The main elements of SD Maternal and Child Healthcare Hospital hoping to be improved are:** shortening the waiting time for

consultation (69.7%), increasing the number of expert physicians (53.7%), and the medical environment (43.0%); the development direction of SD Maternal and Child Health Hospital hoped is: hospitals for public convenience (44.0%), hospital of integrity (44.0%), hospital of fair prices (12.0%), high-tech specialist hospitals (54.0%), high-quality service specialist hospitals (46.0%). 44.7% of patients noted they understand the new hospital construction of SD Maternal and Child Healthcare Hospital and are looking forward to putting it into use as soon as possible.

We found that the medical needs of SD Maternal and Child Healthcare Hospital continue to grow, and high-quality medical services, good medical treatment experience, high-end medical facilities, top-notch medical technologies, and personalized diagnosis and treatment services have become the most direct needs of healthcare customers under the new normal.

5.8.2 Specific strategic measures

Based on the core competitiveness indicator system of Chinese maternal and child health hospitals, SWOT analysis, and 10-year data review and analysis results, this study proposes the following specific measures for SD Maternal and Child Healthcare Hospital to enhance core competitiveness development strategy. It is expected that this study can provide reference for other maternal and child healthcare hospitals to discuss how to cultivate core competitiveness (Research Question 3).

5.8.2.1 Strategic adjustment in human resources: constructing an elite talent training system

In regard to the human resources in the survey, some problems lie ahead: the proportion of staff with high-level professional titles or advanced degrees is low; employees have little motivation for learning; the level of scientific research and teaching capabilities needs to be improved; not many management measures are put forward by hospital administrators; and the innovation awareness is not strong. In this circumstance, specific measures for strategic adjustment are proposed.

1. Cultivating elite medical talents. What should be done includes strengthening human resources management capabilities, building a three-level echelon of discipline leaders, technical backbones, and reserve forces, to gradually fill in the gaps in talents and transform a “pyramid” talent structure.

A responsible, restrictive, competitive, inspiring, and dynamic management and operation mechanism should be established to mobilize the initiative, enthusiasm and creativity of the

talent team. The leadership should play an exemplary role in unifying the talent team, correct value should be formed to shape the team, a sound system should be established to standardize the team, education and training should be conducted to improve the team, the team should be required to value details, and justice in the employment mechanism should be ensured to motivate the team. While providing market-competitive salary and benefits, the hospital should provide doctors with sustainable career development space and build a career development platform for them. Besides, the hospital is supposed to help the team of doctors improve themselves in three aspects: clinical diagnosis and treatment ability, academic ability and leadership.

2. Shaping an excellent hospital management team. The training of core management team of the hospital should be enhanced to transform them from medical experts to management experts. They are expected to master modern hospital management skills, increase awareness of competition, innovate development models according to customer needs to achieve diversified expansion channels. Priority should be given to improve the abilities of hospital leaders in following aspects:

(1) Insight into the external environment: fully grasp the changing trends of the market environment, institutional environment, and technological environment so as to enjoy information superiority at the source;

(2) Organization and coordination ability: various divisions involved in medical care, and management, should coordinate, build a cohesive management group, clarify the role of each member in the process of achieving the overall goal of group development, and coordinate interrelationship of individual development among members.

(3) Learning and innovation ability: The hospital adjusts the medical structure in time according to the changes in the supply and demand of the medical market, the progress of technological innovation and the changes in medical consumption trends, which is the key to the success of hospitals in the complex competitive environment;

What's more, a reserve cadre training mechanism can be established. High-potential talents are attracted and selected through relatively favorable treatment and personal development opportunities, and can gradually master the abilities needed in management positions through systematic learning and training, job rotation, project assignment, combination with teaching and other development activities.

3. Establishing itself as a learning hospital.

(1) Communication and feedback within the hospital. The establishment of an effective communication and feedback mechanism between the middle and senior administrators,

technical experts and frontline medical staff of the hospital will help the hospital maintain the ability to respond quickly to customers and improve the efficiency and vitality of strategic actions.

(2) Mutual learning with customers. A mechanism and platform for mutual learning with customers should be established, and potential customer demand information should be found via big data. Through the interaction and mutual learning with customers, the real needs and feedback of customers can be obtained in a timely and accurate manner, so that customer needs can be sent back to the hospital administration department in the first time, making the hospital decision-making more scientific and improving the service.

(3) Learn from domestic and foreign benchmark hospitals. By actively learning from benchmark hospitals at home and abroad, hospitals can grasp the trends of the market regarding institution, market and technology in a comprehensive way, thus gaining information advantages, and then acquire the ability to perceive environmental changes and improve dynamic response capabilities.

(4) Establish a hospital information center. Obtaining the latest medical technology and medical market information in a timely manner, and quickly transmitting and processing the acquired information within the hospital is an important guarantee for building core competencies.

5.8.2.2 Strategic adjustment in information resources: strengthen informatization construction and build smart hospitals

Externally, science and technology advances rapidly, and Internet-based hospitals and smart medical care also gains momentum. Internally, the level of informatization construction in the hospital is relatively low; the level of hospital electronic medical records application, the maturity of standardization of information interconnection, smart medical classification, and the security level of the information system are at the middle or lower level. Therefore, the following specific measures for strategic adjustment are put forward:

(1) Building a high-quality information management system. Through evaluating the standardization construction of hospital information interconnection and electronic medical record rating, it realizes the docking with such systems as medical insurance, electronic medicine supervision and budget management, and adopts cloud computing and cloud storage to establish a digital hospital with the entire process of human, financial, and material information management.

(2) Providing integrated online-offline medical services. The hospital can apply mobile healthcare, mobile customer service, digital payment, telemedicine, and smart wearable devices to achieve closed-loop monitoring and health management of patients during pre-, in- and post-hospitalization process. The hospital can also apply self-service equipment to realize online appointment registration, self-service inquiry, in-office payment, and automatic medicine distribution so as to provide patients with convenient, safe and efficient “one-stop” smart medical services.

(3) Deep integration of artificial intelligence technology and medical services. The hospital can apply Internet + innovative technologies such as intelligent triage and clinical assistance decision-making to enhance its service capabilities. The hospital can also apply mobile Internet, block chain, Internet of Things, big data and other information technologies to build a regional integrated medical service system so as to realize the integrated process management from smart medicine to telemedicine.

(4) Strengthening the informatization of regional maternal and child healthcare management and building Internet-based maternal and child healthcare hospitals. Making the most of Internet information management methods to implement the classification of pregnant and lying-in women and the hierarchical management of high-risk infant to give full play to the guiding role of the hospital's Obstetrics Quality Control Center and Pediatric Medical Quality Control Center. This can effectively improve treatment capacity of obstetrics and pediatrics in this region and reduces the mortality of pregnant women and infants.

Shunde maternal and children complicated and intractable disease remote medical consultation network is established to connect the towns and streets or private hospitals to realize the role of guidance and patient referral. A regional information system for women and children's health that integrates business, management, service, scientific research and teaching is constructed to realize the women and children information sharing, data security, fee payment, real-time supervision, statistical analysis and benefit distribution in the whole district, and improve the coordination, efficient operation and seamless connection of “two major alliances” of women and children so as to realize the leading role of regional specialties.

5.8.2.3 Strategic adjustment in social resources: establishing a client relationship management system

According to the results of the questionnaire survey of employees: employees lack marketing awareness, have no idea of standardizing client management, and are unable to meet clients' demands (41.6%). The results of the round-table conference showed that 80.0% of

administrators believe that hospitals still need to strengthen their refined management services for clients. Hence the following specific measures for strategic adjustment:

To innovate marketing concepts and establish a hospital customer relationship management system. The introduction of the “customer” management concept into hospital management and the establishment of a customer service center can be conducive to transforming the hospital’s strategic center from focusing on “medical services” to “focusing on customers”. The specific measures of establishing a hospital customer relationship management system include:

(1) To develop new customer needs. By establishing a patient customer database and employing big data analysis to understand various target customer groups, the needs of different types of customers can be satisfied so that patient loyalty can be improved and maintained.

(2) To construct a marketing service network. The marketing strategies can be improved from multiple perspectives such as patients, hospitals, and third-party organizations. **From patients:** The Internet, new media, third-party consultation platforms and other diversified publicizing approaches can be adopted to break through the limitations of hospital services and develop extended services. **From hospital itself:** Multi-channel medical services are opened through various forms such as healthcare promotion and education, specialized alliances, healthcare alliances, and membership system file formation. **From third-party institutions:** To cooperate with local government departments or social organizations such as campuses, communities, factories and enterprises for improving the concept of patient healthcare. To seek cooperation with the healthcare management platforms for providing customized services for high-end customers and developing special medical services.

5.8.2.4 Strategic adjustment in strategic management capabilities: building a new hospital management and operation system and a scientific and technological innovation and practice system

In accordance with the questionnaire survey results of employees, employees are short of marketing and cost awareness, and have poor operational efficiency management (29.2%); the results of the round-table conference show that 80.0% of administrators believe that the hospital has poor awareness of refined management, especially in hospital operations management. 73.3% of managers think that the staff’s scientific research ability is insufficient, the hospital’s scientific research management lacks overall planning, too much emphasis is put on the clinical medical care while the scientific research innovation is neglected, the scientific research collaboration ability among various departments within the hospital is not strong enough, and

there are not many “advanced, sophisticated, cutting-edge” papers. Therefore, the following specific measures for strategic adjustment is put forward:

1. Establishing specialty operation department, and building a new hospital management and operation system

(1) To establish a collaborative governance mechanism for division of labor in medical operation management. The hospital has a specialized operation department, and the business department has an operation secretary to serve the clinic and optimize operation control. Through operations, performance can be improved and optimized and tangible economic benefits can be obtained.

(2) To establish a modern hospital informatization operation management and control system. To achieve comprehensive interconnection of the front office business system and satisfy the hospital's refined management requirements via the back-end business system.

(3) To promote hospital's refined 5S management and total cost accounting management. The establishment of the concept of operation and refined management can help achieve hospital strategic planning refinement, budget management refinement, operating analysis refinement, cost accounting refinement, performance design refinement, and post setting refinement through process re-engineering and PDCA, thus improving hospital operational efficiency.

2. Building Maternal and Child Medical Center, and constructing innovative medical practice system

(1) Building Maternal and Child Medical Center, and constructing innovative medical practice system. It is planned to establish a Maternal and Child Medical Center to promote the harmonious development of “Medical Education and Research” of SD Maternal and Child Healthcare Hospital, and promote the integration of maternal and child resources. The Maternal and Child Medical Center consists of four sub-centers: First, to build a Maternal and Child Medical Center for constructing a discipline brand, and improving the ability to treat difficult and severe diseases; second, to build a Maternal and Child Healthcare Center for promoting an integrated medical service system; third, to build a Maternal and Child Innovation Center for creating a scientific research and academic position and constructing a precision hospital system; fourth, to build a Maternal and Child Education Center for consolidating the foundation of maternal and child healthcare talents.

(2) Constructing a maternal and child innovation center and building a precision medicine practice system. A Research Institute for Maternal and Child Health is to be built for constructing a modern maternal and child research platform through the purchase of

advanced research equipment. This can help improve the principal investigator (PI) responsibility system under the leadership of the hospital academic committee, and establish a new system in line with advanced scientific research management in China and foreign countries. A research key laboratory of rare diseases, Precision Medicine Laboratory, and Medical Big Data Center with maternal and child characteristics of Guangdong Medical University are built and a maternal and child academic community based on the Maternal and Child Health Alliance of Guangdong Medical University is to be built as well.

5.8.2.5 Strategic adjustments in technological service innovation capabilities: building an integrated healthcare service system

The results of the round-table conference show that 80.0% of managers believe that the integrated medical service system has not yet been established, failed to meet the ever-increasing demand for maternal and child healthcare. In response to these problems, the following specific measures for strategic adjustment are proposed:

1. Focusing on health and build an integrated medical care service system. A new medical model that closely connects “predictive medicine, preventive medicine, and individualized medicine” should be formed. Medical services extend from simple treatment to pre-diagnosis and post-diagnosis, and a new medical system with balanced development of “clinical services, medicine, preventive medicine, and rehabilitation medicine” is created to build the integrated medical ecology of “prevention, treatment and health”. Integration with clinical service as the orientation breaks the barriers among divisions. By focusing on the specific service groups of women and children, internal medicine, surgery, psychotherapy, nutrition therapy, rehabilitation, prevention, health care and other disciplines are integrated to provide patients with whole-course service from disease prevention, diagnosis and treatment to rehabilitation services so as to maximize the value of patients (see Figure j.8).

2. Constructing a whole-course health management service chain for maternal and infant life.

Starting from the beginning of life and including a series of outstanding health problems covering pre-marriage, pre-pregnancy, pregnancy, childbirth, after childbirth, neonatal period, infancy, childhood and adolescence, adulthood, menopause and senescence, a three-dimensional integrated closed-loop medical care model of women's health, perinatal health, and child health should be built (see Figure j.9)

5.8.2.6 Strategic adjustment in medical service capabilities: building a disciplinary brand featuring maternal and child healthcare

The results of the client questionnaire survey show that 67.7% of the respondents regard SD Maternal and Child Healthcare Hospital as the first choice for the treatment of women and children with special or major diseases, and that the hospital's ability to treat difficult and severe diseases still needs to be strengthened. The results of the round-table conference show that 80.0% of administrators believe that the hospital is insufficient in specialty brand influence, and has no province-level key specialties. To respond to these problems, the following specific measures for strategic adjustment are proposed:

Firstly, a Maternal and Child Medical Center should be set up to build a discipline brand, and enhance the strength and connotation in professional disciplines, including Respiratory Diseases Diagnosis and Treatment Center for Children, Hematological Tumor Treatment Center for Children , Digestive Disease Diagnosis and Treatment Center for Children, Regional Diagnosis and Treatment Center of Difficult and Critical Illness for Children, and Gynecological Cancer Prevention and Treatment Center and Reproductive Medicine Center.

1. Creating a disciplinary brand featuring maternal and child healthcare

The strength and connotation of professional disciplines are supposed to be enhanced to create disciplines featuring maternal and child healthcare and build subspecialties brand. The hospital plans phased construction of disciplinary brands including Respiratory Diseases Diagnosis and Treatment Center for Children, Hematological Tumor Treatment Center for Children, Gynecological Cancer Prevention and Treatment Center and Reproductive Medicine Center, and Digestive Disease Diagnosis and Treatment Center for Children.

2. Establishing a Regional Diagnosis and Treatment Center of Difficult and Critical Illness for Women and Children

Prenatal diagnosis and newborn screening should be conducted to sift out genetic high-risk diseases, and a rare and difficult disease case database and sample database, should be built to establish a Diagnosis and Treatment Center of Difficult and Critical Illness for Women and Children in Shunde district. Efforts that should be made includes ①conducting research on precision treatment of respiratory tract infectious diseases for children based on pharmacokinetics and pharmacodynamics; ②carrying out research on the development of fetal medicine and maternal medicine; ③conducting molecular diagnosis of rare genetic diseases; ④carrying out research on gene therapy and stem cell therapy for rare genetic diseases, and

other related researches to improve the ability to treat critical and difficult diseases for women and children.

5.8.2.7 Strategic adjustment in district management capability: establishing a regional maternal and child healthcare alliance

According to the results of the round-table conference: 66.7% of hospital administrators mentioned that the hospital's regional maternal and child health management network is far from perfect, and the regional maternal and child healthcare business fails to integrate with the inter-hospital business. In response to these problems, the following specific measures are proposed for strategic adjustment:

The Maternal and Child Medical Specialized Alliance and the Maternal and Child Healthcare Alliance should be established. A regional alliance for the purpose of constructing a medical ecosphere is established, and together with 10 town (street) hospitals and 10 community health service centers in Shunde District, forms the Maternal and Child Medical Specialty Alliance and Maternal and Child Healthcare Alliance. The efficient operation of the two major alliances should be actively promoted. Through equalization, standardization, and homogeneity of services, partner assistance, implementation of "two-way referral", rational flow of personnel, strengthening technical collaboration and technical training, high-level regional alliance is built to enhance the influence and radiation abilities of SD Maternal and Child Healthcare Hospital.

5.8.2.8 Strategic adjustment in hospital culture: building a culture of caring that encourages innovation and puts patients first

The results of a questionnaire survey of employees shows that, in terms of SD Maternal and Child Healthcare Hospital's cultural awareness, 21.7% of employees do not know that the hospital have values, and 22.0% of employees do not know the spirit of the hospital. The results of the round-table conference indicate that 66.7% of hospital administrators believe that the medical staff's awareness of actively providing service needs to be strengthened, and 60% of hospital managers believe that the awareness of hospital innovation management needs to be strengthened. Hence the following specific measures for strategic adjustment:

1. Constructing "family" culture caring for women and children

(1) The hospital should construct a medical practitioner service culture with "respect, communication, participation, and healing" as the core. After three years, the plan is to comprehensively improve the service awareness and skills of employees, cultivate a group of high-quality service internal trainers in the hospital, and improve the service awareness of all

employees from point to area; use the hospital information method to fully optimize the patient's treatment process, shorten the patient's treatment time, and highlight the safety and respect of medical services; introduce medical social workers and charity fund organizations into hospitals, promote medical humanistic care with the mode of "medical social workers + voluntary services", implement precision public welfare assistance, design public welfare service projects for specific diseases, and develop public welfare charity activities; strengthen doctor-patient communication, enhance the friendly exchange of information between doctors and patients, and elevate the patients' sense of participation in the diagnosis and treatment process.

(2) The hospital should care employees and bestow them with a sense of belonging like home. It should fully respect the interests of employees. While actively promoting salary incentives, the hospital should regard taking care of medical staff and creating a warm and safe working environment as an important part of the hospital's cultural construction through such measures as establishing professional honors, improving hospital environment, and protecting rights in accordance with the law.

2. Creating a hospital culture that encourages innovation and tolerates failure

The hospital should create a culture that encourages innovation and tolerates failure, and establishes an institutionalized mechanism to encourage, cultivate and incubate the next generation of innovation. **①Innovation of way of thinking:** derive benefit from management, change development philosophy, and establish a development concept centered on health and medical care experience and services. **②Means innovation:** optimize hospital business process and structure, outpatient and inpatient business process and structure, and structure of diseases that can be treated; optimize the reasonable layout of clinical technology and business process, and enhance competitiveness with characteristic technological advantages and innovation. **③Service innovation:** rely on science and technology such as precision medicine, telemedicine and Internet-based hospitals, to comprehensively improve the way of providing traditional medical service in terms of time, indoor space, planning, curative effect, and cost. **④System innovation:** build a high-quality and efficient integrated medical and health service system.

3. Strengthening hospital culture management and dissemination

The cultural construction of the hospital is taken as the basis of leading the implementation of strategies so that every employee will be familiar with and understand the hospital's core values and mission, get to know and understand the hospital's goals and vision. Eventually, it

will be converted into code of conduct for every employee. The hospital culture should be promoted in various forms so that a sense of collective honor and spirit of unity and cooperation can be cultivated among employees. Medical humanities classes and narrative medical training can be offered to advocate the benevolence of doctors, who will in turn contribute to society and improve the reputation of the hospital. What's more, great importance should be attached to the innovation of hospital culture, including the innovation of spirit culture, individual behavior culture, system culture and material culture, thereby creating a good environment for the all-round development of medical service, clinical medicine and medical research. In addition, by bearing in mind the main task of cultural innovation and following the development requirements of modern productive forces and the development rules of modern medicine, the hospital is supposed to achieve a series of breakthroughs on the basis of the ideology of staff and management philosophy.

5.9 Implementation steps

Based on the scientific analysis of internal and external environment of hospitals' development, we, starting from hospital development visions, operational philosophy and missions, formulated the steps to implement core development strategies and stage goals in next five years (see Table 5.4).

Table 5.4 Steps for SD Maternal and Child Healthcare Hospital to enhance core development strategy and stage goals in the next 5 years

Improving strategies	Item classification	Short-term goals (one year)	Mid-term goals (three years)	Long-term goals (five years)
		Improve key strengths	Enhance quality construction	Build a quality hospital
	Main goals	Implement the relocation plan for the new hospital	By the end of 2023, it is planned to build a modern, high-level university-affiliated women and children's hospital that integrates health care, medical treatment, scientific research, and teaching.	The hospital strives to become a well-known home for women and children on the west bank of the Pearl River by 2025. The comprehensive strength of the hospital ranks among the top 5 in the province. The infant mortality rate in the whole district does not exceed 3‰. The mortality rate of children under 5 years old does not exceed 7‰, and the maternal mortality rate does not exceed 10 per 100,000.
Obtain resources	VRIO Improve medical quality	The hospital will complete the re-evaluation of the grade A tertiary maternal and child healthcare hospitals or the review of the grade A tertiary women and children specialized hospital in 2021 The imaging department will become a key specialty at district-level in 2021	The hospital will apply for international hospital authorization in 2023 Gynecology, obstetrics, reproductive medicine, children's health care, and women's health care will become municipal key specialties, and breast department and pediatric surgery will become district-level key specialties in 2022;	The hospital will finish international hospital certification and initially establish itself as domestic quality hospital in 2025 Neonatology and pediatrics will be developed into provincial key specialties in 2025.

Core Competitiveness Strategic Thinking in China's Maternal and Child Healthcare Hospitals

Improving strategies	Item classification	Short-term goals (one year)	Mid-term goals (three years)	Long-term goals (five years)
		Improve key strengths	Enhance quality construction	Build a quality hospital
	Women and child health project	By the end of 2021, the hospital will create two or three unique health care projects in the city, improve the construction of the four major business departments and establish the Shunde Maternal and Child Specialty Alliance and the Shunde Maternal and Child Healthcare Alliance.	In 2020, the maternal and child healthcare projects defined by the tertiary maternal and child health hospitals will be fully implemented. In 2023, the rate of prenatal examinations for parturients will reach 98%, and the high-quality services for pre-pregnancy eugenics guidance will be fully covered.	The prenatal check-up rate will reach 100%, and the maternal and child health service projects will be fully conducted; The development of four major business departments will be standardized to improve the regional health services for women and children.
	Strengthening hospital through talents project	The hospital will establish technical cooperation with Hong Kong Queen Mary Hospital and Zhujiang Hospital in 2021, and build specialties alliances with the First Affiliated Hospital of Sun Yat-sen University and Provincial Maternal and Child Healthcare Hospital. to promote international exchanges and cooperation.	In 2023, the team of academician Lang Jinghe, a gynecological expert from Peking Union Medical College Hospital will be introduced to establish the "Lang Jinghe Academician Workstation" of the Women and children's hospital affiliated to Guangdong Medical University. In 2023, it will join hands with the Women and Children's Center of the University of Pittsburgh in the United States to form sister hospitals to establish an international children's medical remote consultation center to improve clinical technology and scientific research capabilities for the treatment of critically ill children.	In 2025, a team for research and teaching (Maternal and Child Medical College, and Research Institute for Maternal and Child Health) will be established. The key laboratory of maternal and child medicine research of Guangdong Medical University will be built.

Improving strategies	Item classification	Short-term goals (one year)	Mid-term goals (three years)	Long-term goals (five years)
		Improve key strengths	Enhance quality construction	Build a quality hospital
Develop dynamic capabilities	Lean management project	<p>The construction of clinical skills training centers will be strengthened, and by the end of 2021, 80% of physicians are required to be equipped with necessary teaching capabilities.</p> <p>In 2020, a clinical database of birth cohort (full life cycle follow-up) will be established to collect big data on women and children's health and medical care in our district, so as to provide decision-making guidance for women and children's health undertakings in our district.</p> <p>Optimize the HERP system and improve hospital operation management. Continue to promote 5S management.</p>	<p>In 2022, it will become the region's intensive care training center for pediatrics, neonatology, and obstetrics. 5 high-end academic leaders will be introduced.</p> <p>By 2022, precision medical centers for gynecological tumors, human assisted reproductive medicine, and children's genetic and metabolic diseases will be erected. High-end scientific research teams will be introduced to build a high-level scientific research platform. Breakthroughs in provincial scientific research projects and national natural science fund projects will be made in 2022.</p> <p>Use an intensive platform to build a humanized (patient and employee) and safe hardware facilities and software environment. Optimize logistics services and strive for the online energy management system.</p>	<p>By 2025, the pediatric surgery, anesthesiology or imaging department will apply for standardized and coordinated training base, reaching the level of social enrollment. Shunde Women and Children's Medical College will be set up.</p> <p>In 2025, two scientific research projects will be completed through data analysis of the birth cohort database. Maternal and Child Medical Center in Shunde District will be established.</p> <p>Complete international hospital certification in 2025.</p>
		<p>In 2021, all outpatient self-service terminal equipment will be upgraded and replaced, basically achieving "zero queuing" in outpatient services.</p> <p>Internet hospital construction</p>	<p>In 2023, a new inpatient electronic medical record system and hospital information integration platform will be built.</p>	<p>Build a hospital operation decision-making system and achieve a fifth-level maturity of interconnection and interoperability of information systems by 2025.</p>
			Smart medical project	

Core Competitiveness Strategic Thinking in China's Maternal and Child Healthcare Hospitals

Improving strategies	Item classification	Short-term goals (one year)	Mid-term goals (three years)	Long-term goals (five years)
		Improve key strengths	Enhance quality construction	Build a quality hospital
	Disciplinary system construction project	In 2021, the hospital will build a Pediatric Blood Disease Treatment Center, a Pediatric Difficult and Critically Ill Treatment Center, and an Institute of Respiratory Diseases for Children.	In 2023, the hospital will build a Gynecological Cancer Prevention Center, a Reproductive Medicine Center, and a Child Digestive Disease Diagnosis and Treatment Center.	In 2025, the hospital will complete the construction of a Maternal and Child Medical Center
Building a unique hospital culture system	Hospital humanities construction project	Carry out high-quality service PDCA improvement projects and build premium service pilot wards. expand the rank of volunteers Promote the improvement plan of outpatient quality service.	The high-quality service pilot ward is operated maturely. own a stable team of volunteers. Complete the outpatient service quality improvement plan.	Fully implement high-quality service demonstration wards. Build a humanistic hospital that is benchmarked with domestic standards.

5.10 Guarantee measures for strategic improvement of SD Maternal and Child Healthcare Hospital's score competitiveness

Based on the historical data throughout ten years, it is found that in 2013, the SD Maternal and Child Healthcare Hospital had a greater potential for losing its core competitiveness due to changes in the hospital's director and management team. In order to prevent the SD Maternal and Child Healthcare Hospital from relying too much on individuals for its core competitiveness, the author proposes several guarantee measures to enhance the core competitiveness strategy:

5.10.1 Organization structure security

To establish a human resources management department for building a new pattern of talent development; to establish a customer relationship management department for building a new hospital management model; to establish an operation management department for building a modern hospital operating system; to establish a health management department for building a new model of modern maternal and child healthcare services; to establish a hospital cultural promotion department for building a unique hospital culture; to establish a hospital information center for building an internal and external information collection system.

Through implementing a “flat” internal structure management structure, following the principle of functional withdrawal and centralization, and successively executing the department system, the grand department system combining clinical and healthcare, the centralization of diagnosis and treatment, and the reform of logistics service clusters, the cost of human resources can be effectively reduced and work and service efficiency will be greatly improved (see Figure j.9).

5.10.2 System guarantee

1.To improve the comprehensive, multi-level and multi-dimensional quality management system. Taking patients as the center of management, a medical quality management system and an evaluation indicator system for department quality management should be established, a three-level management of medical quality implemented, a “functional department-division-district” three-level quality control system constructed, and medical quality and safety management effectively and further strengthened. At the same time, a medical quality and

safety management system should be established and the hospital's quality management awareness strengthened so that the hospital's quality and public image can be improved.

2.To construct a value-oriented performance management system. A scientific performance distribution system should be established and the hospital be oriented by the value of medical staff's labor service, with the goal of "distribution according to labor division, more work and more rewards, excellent performance and better remuneration". The hospital should take into comprehensive account the following eight factors, namely service quality, job workload, treatment difficulties, cost control of diagnosis and treatment, medical ethics construction, patient satisfaction, clinical research and teaching so as to gradually construct a performance management system oriented by specialty characteristics and knowledge value. The clinical department implements the three-level management of hospital, department, and medical group, as well as the medical team leader responsibility system under the leadership of the department director. Performance evaluation is based on workload, quality control and cost control; medical technology and auxiliary departments set core inspection and checking project points based upon work indicators such as inspection difficulties, risks, intensity, personnel input, and time consumption, and the total frequency of each core inspection project is employed as the basis for accounting workload and revising actual performance by combining with quality control and cost control assessment scores.

3.To establish a personnel management system that conforms to the characteristics of the industry. The hospital will steadily promote the comprehensive reform of the personnel system through such methods as determining posts according to regulations, setting up posts and responsibilities according to needs, innovating recruitment, assessment and personnel management models, and formulating appropriate preferential recruitment plans for departments that are in urgent need of high-level talents. The hospital should also implement various salary distribution systems such as job performance salary system, annual salary system, and agreed salary according to personnel and job categories; adopt a concurrent evaluation and assessment mechanism of incentives and constraints, and bestow performance-based salary rewards for outstanding personnel who have made outstanding contributions in medical education and research so as to achieve "better rewards for better work"; give preferential policies to front-line employees with high professional risks, high technical difficulties, and heavy responsibilities.

5.10.3 Funding guarantee

In the next four years, the government plans to invest 1.5 billion yuan to build a new modern humanities hospital covering an area of 120 acres and with 1,000 sickbeds to further expand the medical reception capacity and enlarge the scope of medical radiation. At the same time, the hospital will increase its internal budget. Under the premise of balancing revenue and expenditure, special funds for talents will be increased in addition to ensuring personnel funds, equipment, and information inputs in the budget each year. At the same time, the expenditures for 2020-2025 are listed according to the development plan and implementation content of the phases (see Table 5.5).

Table 5.5 2020-2025 phased development projects and the budget of SD Maternal and Child Healthcare Hospital (unit: 10,000 yuan)

Funding items		Specific objectives	Budget investment/year
New hospital construction		To build a modern new hospital	Total investment of 1.5 billion
Equipment investment		To improve resource competitiveness	7-8% of the operating revenue
Human resources training		Professional training and further education Training of managerial personnel	The total human resources cost is 3-5%, of which 70-80% is used for professional training and further education, and 20-30% for the training of managerial personnel
Medical research	scientific	To build talent echelon	3-5% of the operating revenue
Management system construction		To achieve technology leadership	3-5% of the operating revenue
Informatization construction		To establish a modern medical management system	3-5% of the operating revenue
Hospital construction	culture	To realize smart hospitals	0.5-1.5% of the operating revenue
		To cultivate caring "family culture"	0.5-1% of the operating revenue

5.10.4 Information technology support

It is necessary to establish a complete information support system, and integrate a holistic solution with HRP. First of all, the hospital's strategic goals and cost efficiency, performance management, decision-making quality and medical quality, knowledge management, and customer management are integrated to provide strong support and guarantee for hospital management through the HRP information system. Secondly, the hospital should establish a provincial DRGS analysis system so as to clearly understand the relevant information of competitors and the industry, which is the data source for the hospital to make strategic plans. Thirdly, the hospital should establish the HCRM (Hospital Customer Relationship Management, hereinafter abbreviated as HCRM) application system to integrate current medical information

technology, including such functional modules as clinical medicine technology, data management system, logistics management, medical marketing, customer services, Internet and network technology, data mining and customer data analysis. At the same time, the hospital should coordinate the system with its information construction in the process of medical resource utilization and value realization for complete integration, continuously improve all business processes related to customer relationship management, integrate hospital resources, and respond to customer needs in a real-time manner.

5.11 Improvement strategy evaluation of SD Maternal and Child Healthcare Hospital's core competitiveness

Strategic evaluation is to compare the actual results with expected strategic goals, and the evaluation results are the basis for strategic adjustments and changes. SD Maternal and Child Healthcare Hospital will monitor and evaluate phased results in accordance with the time schedule, implement mid-term evaluation in 2022, offer stage evaluation regarding the implementation of the plan, discuss and solve difficulties and problems in the implementation of the plan, propose revision and improvement suggestions, and implement the plan after appropriate adjustments; a final stage assessment will be conducted at the end of 2025, the time when the implementation will be completed, for carrying out a comprehensive evaluation of the implementation during the planning period. The evaluation methods include internal evaluation system and external evaluation system.

Internal evaluation system: We used the evaluation index system of core competitiveness of Chinese maternal and child healthcare hospitals to quantify and evaluate the effects of strategy implementation. The strategy effects were assessed based on improvements of indexes and changes of total scores.

The “balanced scorecard” evaluation system (Robert Kaplan and David Norton) was introduced. The hospital's strategic goals are decomposed layer by layer, which are transformed into a specific and balanced performance appraisal index system, and assessed at different time periods to establish a reliable execution basis for the completion of the hospital's strategic objectives. Starting from such dimensions as customers, finance, and innovation, and combined with the focus of each dimension, the hospital can formulate practical, feasible, and advanced evaluation indicators, and promote implementation.

External evaluation system: Guided by the national performance evaluation index system of Chinese maternal and child healthcare institutions, the hospital should establish an evaluation

system centered on the performance of public health functions, service quality and safety, service quantity, and public satisfaction. Through a horizontal comparison, the competitiveness of hospitals can be grasped. Through a longitudinal analysis based on the national-level evaluation results and taking benchmark hospitals for comparison, the problems in hospitals can be found out so as to promote continuous improvement of work.

5.12 Strategic control to improve SD Maternal and Child Healthcare Hospital's core competitiveness

Under the premise of establishing goals and judgment standards, the hospital can establish an information statistics analysis and feedback system and a monitoring system and correction mechanism for its development strategy implementation, and conduct strategic performance evaluation by collecting relevant information and data during the hospital's strategic management evaluation cycle. Through performance inspection and evaluation, strategic correction and continuous improvement can be carried out. The feedback of the inspection and evaluation results should be given to relevant departments and positions. Therefore, the hospital can supervise and timely adjust target plans and implementation strategies, formulate corrective and preventive measures, and continuously improve the hospital's development and strategic management plan.

5.13 Improvement strategy adjustment and reform of SD Maternal and Child Healthcare Hospital's core competitiveness

The strategic management process to enhance core competitiveness features a dynamic development trend. The hospital makes strategic adjustments and reforms in order to obtain or maintain the hospital's competitive advantages.

Through strategic adjustments and reforms, the hospital can flexibly adapt to the ever-changing external and internal environments, promptly and effectively respond to problems arising in the hospital's strategic management process, and ensure the realization of strategic goals.

This study proposes the following suggestions for the strategic adjustment and reform of SD Maternal and Child Healthcare Hospital: to improve the ability of continuous learning and growth, and ensure the ability of continuous innovation; to establish a flexible organizational

structure for adapting to the hospital's strategic adjustment; to improve the strategic awareness of all employees, and unify employees' behavior.

5.14 Summary

This study takes SD Maternal and Child Healthcare Hospital as the empirical object of the case study, adopts SWOT analysis and other methods, and combines the questionnaire survey on clients and employees of SD Maternal and Child Healthcare Hospital, round-table conference, and the analysis of key factors in the past ten years' development based on a full analysis of the internal and external environment of the research case. The results show that the main factors that enable hospitals to gain a competitive advantage are: the optimization of resources allocation, the formation of dynamic capabilities, and the cultivation of hospital culture.

Based on the above analysis and combined with the comprehensive evaluation model of the core competitiveness of Chinese Maternal and Child Healthcare Hospital established by this research, this study puts forward the strategy and implementation method of SD Maternal and Child Healthcare Hospital for enhancing its core competitiveness.

Strategic positioning: SD Maternal and Child Healthcare Hospital takes women and children (including sub-healthy people, patients, and healthy people in need) as the main service groups to provide active medical care services throughout the entire life cycle and it will choose a specialized competition strategy.

The main content of the specialization strategy includes:

① Human resources: To construct an elite talent training system, cultivate elite medical talents and hospital management teams, establish a reserve cadre training mechanism, , and focus on cultivating and improving hospital leaders' insight into the external environment, market response capabilities, and organization and coordination capabilities, and establish a learning hospital.

② Information resources: Using Internet hospitals as the carrier, the hospital can form an online and offline service system to strengthen the construction of informatization and be built into a smart hospital.

③ Social resources and brands: The hospital should create a marketing concept, establish a hospital customer relationship management system, develop new customer needs, and build a marketing service network.

④ Strategic management: The specialty operation department should be established to construct a new system of hospital management and operation. The hospital should set up a

Maternal and Child Medical Center and develop an innovative medical practice system.

⑤ Technical service innovation: To build an integrated medical care service system with health as the core, and establish a whole-process healthcare management medicare service chain for maternal and infant customer groups.

⑥ Medical service capacity: To build a disciplinary brand featuring maternal and child healthcare and set up regional treatment center of difficult and critical illness for women and children.

⑦ Administrative capacity in the jurisdiction: To establish a regional women and children healthcare alliance, which is supposed to play an exemplary and leading role, and enhance regional radiation capabilities.

⑧ Cultural system: To build “family” culture caring for women and children, cultivate hospital culture that encourage innovation and tolerate failure and strengthen the management and dissemination of culture.

The construction of the core competitiveness of the Maternal and Child Healthcare Hospital is also a continuous and dynamic process. Continuous innovation is the primary driving force for maintaining the hospital's development and an important manifestation of the improvement of dynamic capabilities. Only by adapting to the hospital's internal environment and external market changes, continuous change and innovation, can the sustainable development of the hospital be realized.

[This page is deliberately left blank.]

Chapter 6: Discussion, Conclusions and Limitations

6.1 Overview

This chapter discusses and summarizes the research results, including the research conclusions, theoretical contribution, research significance, research limitations and future prospects.

6.2 Research discussion

In response to four problems: What is the core competitiveness of medical institutions? How is the core competitiveness of maternal and child health care hospitals defined? How to cultivate the core competitiveness of maternal and child health care hospitals? What is the important role of enhancing the core competitiveness of maternal and child health care hospitals in an environment of reform? This thesis conducts an in-depth study on the resources, capabilities, core competitiveness and competitive advantages of SD Maternal and Child Health Care Hospital, Specifically, the research has the findings as below.

6.2.1 What is the core competitiveness of maternal and child healthcare? How is the core competitiveness of maternal and child health care hospitals defined?

Delphi method was used in this study. On the basis of literature review and expert consultation, a total of 75 initial indicators were screened and determined, and then evaluated by 32 experts. According to the experts' opinions that "there exists certain commonalities or overlaps for indicators in the initial survey index", identical or similar indicators are merged and screened.

Finally, we find that the structure includes eight aspects: human resources, information resources, social resources and branding (VRIO resources), medical service capabilities, district management capabilities (VRIO capabilities), strategic management capabilities, technological service innovation (dynamic capabilities), and cultural systems (hospital culture). This is a model with a total of 41 measurable evaluation indexes. In the model demonstration stage, the total scores were calculated and obtained by using the data of the core competitiveness evaluation model indicators of 6 maternal and child healthcare hospitals. The model was also verified by the 2018 national performance ranking and the weighted TOPISIS method. The

results showed that the ranking results produced by the three methods were significantly positively correlated (the correlation coefficients are all > 0.8 , $P < 0.05$).

During the expert grading process, experts raised certain opinions in their interviews on the adoption and discard of indicators, indicator monitoring, and indicator meanings and others. And the main summary is as follows:

(1) Resource and organizational capabilities selection from the perspective of VRIO demonstrates that human resources, information resources, social relationship resources, medical service provision capabilities, district management capabilities among others have displayed more significant inimitability and irreplaceability than other resources and capabilities.

- Human resources are a special resource. In the process of evaluating and using human resources indicators, we should pay attention to the role of learning investment and scientific research investment in improving the overall human resources structure. Among the human resource elements, in addition to the professional and technical personnel with high education and high professional title, the top managers with unique abilities are favored by experts. According to the survey, experts generally believe that human resources play a critical role in improving hospital's core competitiveness. Human resources are the carrier of knowledge and skills, so high-level talents, who are the scarce resources, can bring competitive advantage to the hospital. In the case study, it was found that in 2019, SD Maternal and Child Health Hospital set up a new team and vigorously introduced experts and doctor teams, which greatly improved the scientific research and discipline construction of the hospital. Hospital business has reached a historical peak. Therefore, human resources in the hospital are the "carriers" of core competitiveness.

- The interviewed experts believe that as modern science and technology develops rapidly, the quality and level of information resources should be integrated with the development of the times, and get updated in line with the times. The construction of smart hospitals is one of the key elements of the construction of hospitals' core competitiveness. Informatization construction plays an important role in supporting hospital management and operation. The online-offline integrated medical services represent the future development trend.

- Among social resources, in the eyes of experts, the proportion of remote patients reflects the radiation capacity of medical services, and patient satisfaction is positively correlated to patient loyalty in a sense, so it is an important reflection of hospital client resources. According to the analysis of the contributing factors behind the hospital's success in the past

10 years, patient satisfaction between 2015 and 2019 was at a relatively high level, and the number of outpatients and inpatients grew steadily, which also brings benefits to the hospital. Good reputation and brand imaging of the hospital can bring customer resources. Therefore, stronger social relation resources can lead to added value for the hospital.

- Among the indicators of hospital organizational ability, experts focus on medical service ability and district management ability. As for the medical service capabilities, experts attach great importance to the medical quality management and the ability to treat patients with difficult and critical illness, and emphasize that district management capability is the organizational capability with the characteristics of maternal and child healthcare hospitals. According to the results of the round-table conference, the hospital administrators believe that the establishment of a regional maternal and child health management network among hospitals, coupled with the organic integration of the hospital's business, can promote the development of the hospital's internal business. Therefore, the district management capability is one of the important elements for maternal and child health hospitals to enhance its core competitiveness.

The survey results show that VRIO resources and organizational capabilities are the basic support and carrier of core competitiveness. Hospitals with more VRIO resources and organizational capabilities are more likely to have competitive advantages.

(2) Among the hospital's dynamic capability indicators, experts center on strategic management capabilities and technical service innovation capabilities. In terms of the strategic management capabilities, experts emphasize the training and introduction of hospital talents and the construction of key specialties; as for technical service innovation capabilities, experts not only believe that scientific research investment is relatively important and emphasize the ability to build an integrated healthcare service system, but also consider that the ability to build an integrated healthcare service system is an important core competitiveness indicator that distinguishes healthcare institutions from other medical institutions. Only when an integrated health care service system is effectively established can health care be combined with clinical practice, highlighting the disciplinary characteristics of the healthcare institutions, and meeting the high-quality public healthcare needs in new era.

In addition, we found that in 2018, the top H1, H6, and H2 hospitals in the national performance rankings had higher scores on all indicators of dynamic capabilities (Table 4.7 and Table 4.8). To a certain extent, the national performance ranking reflects the comprehensive strength of MCH hospitals. Therefore, hospitals with strong dynamic ability are more likely to have a leading position in the medical field.

In the analysis of the hospital's success factors in the past 10 years, it was found that based on the major change in the managerial personnel of SD Maternal and Child Healthcare Hospital in 2013, major changes have taken place in the organizational structure of the hospital, which has seriously affected the development of the hospital, the case study discloses that in spite of VRIN resources the hospital have, if they are controlled by unskilled hospital administrators, or the administrators make unreasonable use of these resources, it will be difficult for the hospital to form a competitive advantage, let alone achieve the promotion in core competitiveness. This is consistent with Nuno and Nelson's theory that competitive advantage stems from VRI capabilities, rather than from VRIO resources (Nuno & Nelson, 2012). In 2015 and 2019, the SD Maternal and Child Healthcare Hospital formed a new leadership team, vigorously introduced talents and carried out a series of innovation and reform, and its outpatient and inpatient numbers, net profit, as well as patient and employee satisfaction have all increased significantly. The empirical evidence bears out that, without the integration of management structure, the simple stacking of individuals' resources and abilities does not constitute the core competitiveness of the hospital. Only by transforming and restructuring the management structure, can they form core competitiveness that are better than that of its market competitors and can achieve added value. It can be seen that hospitals with greater dynamic capabilities are more likely to have competitive advantages, and dynamic capabilities are necessary to form the core competitiveness of hospitals.

In addition, improving the quality of management is essential to the strategic development of the entire medical institution. Maintaining the stability of management is conducive to the formation of a stable and healthy hospital culture and values, and plays a vital role in achieving continuous management innovation.

(2) While obtaining the evaluation model indexes of core competitiveness in 6 maternal and child healthcare hospitals, this study found that the score of core competitiveness is positively correlated with the score of hospital culture, the H1 and H6 hospitals boast relatively high scores in the national performance ranking and core competitiveness assessment of 2018, and their scores in hospital culture are all above 10, indicating that they have a relatively perfect hospital culture system, especially in the case of clear vision and core values.

In the hospital culture questionnaire, experts believe that the hospital culture has a leading role in the strategic development of the hospital, especially the establishment of core values, which can promote the collaboration of employees in the formation of the core competitiveness of the hospital and enhance the inimitable nature of the core competitiveness. In the survey of the elements of core values, a relatively consistent argument among experts is that due to the

special division of labor in the maternal and child health hospital with “women and children” as the main target groups, the establishment of a “people-oriented” caring service culture should be cultivated, which not only emphasizes the care for clients, but also care for employees. What's more, experts attach great importance to a culture that encourages learning and innovation. Only when employees conduct diversified business explorations, can hospitals adapt to the fast-changing external environment. Besides, based on expert interviews and analysis of key factors in the development of SD Maternal and Child Healthcare Hospital in the past decade, this study found that due to a major change in the hospital's managerial personnel in 2013, its development was severely impacted, hospital culture was shocked, and the cohesion of medical staff was hit hard. Employee satisfaction and hospital business growth rate in 2013 and 2014 were the lowest in history. In 2015, the new president of the hospital took the position and established the “family culture”, since the hospital is committed to improving the sense of belonging of employees and offering “patient first” services through promoting a sense of “home” culture, the satisfaction level of patients remains at the top three and that of employees ranks first in the district in the past five years, hospital performance had been growing at the same time.

In addition, although the knowledge possessed by human resources is an integral part of organization capabilities, the competitive advantages it brings may be short-term due to the mobility of talents. The hospital should build a systemic hospital culture featuring learning and innovation, so that the knowledge of different employees can be integrated through exchange, which can eventually contribute to the long-term competitive advantage of the hospital.

Therefore, the unique “hospital culture” is the driving force for building the core competitiveness of the hospital. By building a hospital culture with its own characteristics, the hospital may obtain more competitive advantages.

(3) Since the China maternal and child health hospitals themselves belong to public medical institution, based on the above research results and learning from the research results of the core competitiveness of enterprises, the core competitiveness of Chinese medical institutions and maternal and child health hospitals is defined as follows: the organic combination of a series of complementary VRIO resources and organizational capabilities, dynamic capabilities, and hospital culture. It is the overall operation capability of the hospital achieved through the integration of unique hospital culture and management.

VRIO resources and organizational capabilities are the carrier and foundation of the hospital's core competitiveness. The unique hospital culture is the driving force for the

construction of the hospital's core competitiveness, and dynamic capabilities are necessary to the formation of the hospital's core competitiveness.

The constituent elements of the core competitiveness of Chinese maternal and child healthcare hospitals include: human resources, social resources, information resources, district management capabilities, medical service capabilities, technical service innovation capabilities, strategic management capabilities, and unique hospital culture.

The application of specialized strategy, the district management ability, the ability to build an integrated medical and health care service system are important core competitiveness elements with the characteristics of maternal and child health hospitals.

6.2.2 How to cultivate the core competitiveness of maternal and child health care hospitals?

In order to effectively cultivate core competitiveness, the hospital must be clear about its own resources and capabilities. Taking SD Maternal and Child Healthcare Hospital as an example, and guided by the core competitiveness evaluation indicator system of Chinese maternal and child healthcare hospitals constructed in this research, SWOT analysis method was carried out on SD Maternal and Child Healthcare Hospital. Among them, SW analysis refers to the analysis of internal resources, capability, dynamics ability and culture; OT analysis means the PESTEL analysis of SD Maternal and Child Healthcare Hospital. Taking into account the analysis results of questionnaire surveys, round-table conference, 10-year data review, this study proposes a development strategy to cultivate and enhance the core competitiveness of maternal and child health hospitals.

Here are the results:

1. Strengths of SD Maternal and Child Healthcare Hospital (S): the only Grade A tertiary maternity and child healthcare hospital in the local area; clear organizational structure, complete management functions, and clear division of labor; relatively complete medical quality management system and quality service management system; acceptable medical radiation capabilities; patient structure conforming to the functional characteristics of the hospital; the initial establishment of service culture of the care.

2. Weaknesses of SD Maternal and Child Healthcare Hospital (W):

From the perspective of rare resources: insufficient development space, lack of outstanding disciplinary advantages, short of high-end talents, and weak awareness of the overall improvement of the strength in medicine, education and research.

From the perspective of organizational ability: the hospital's ability to treat difficult and severe illness still needs to be strengthened; the concept of client relationship management has not been established; the hospital's management is relatively loose, the operating cost is high, and the benefits of operation management have much room for improvement; the awareness of cooperated construction and coordinated development is also insufficient, the regional maternal and child health management network has not been perfected, and the regional maternal and child healthcare business coordination has not been integrated with the hospital business.

From the perspective of dynamic capabilities: employees have limited scientific research and teaching capabilities, and their enthusiasm for learning needs to be improved; hospital administrators and employees have insufficient awareness of crisis and competition, there are not many innovations around the reform and development of hospitals and the reform should be intensified. Much can be done to innovate development model and diversify expansion channels, and the resources and platforms of universities have not been fully exploited; the service model has not been updated in time and the integrated medical service system has not been established.

From the perspective of hospital culture: the top-level design should be enhanced, the core values of the hospital, the overall vision and goals of the development are far from clear; the autonomy of medical staff to provide service needs to be strengthened, and the awareness of learning and innovation is supposed to be strengthened.

3. Opportunities of SD Maternal and Child Healthcare Hospital (O): the two-child policy takes effect; due to the healthy China strategy, the awareness of active medical care is increased; economic development allows higher awareness of health among the public, and the demand and requirements for medical care services increase; Internet-based hospitals and smart medical care advances rapidly; the construction of new hospitals obtain investment.

4. Threats of SD Maternal and Child Healthcare Hospital (T): great competition pressure as surrounding hospitals are developing rapidly and overtake it; talent competition pressure; medical reform policies such as the cancellation of medicine markup; medical resources sinking, and the decrease in the number of consultations due to hierarchical diagnosis and treatment.

Through a questionnaire survey of 300 clients seeking medical service, combined with the opinions and suggestions of staff questionnaires and round-table conference, the client positioning and strategic positioning of Chinese maternal and child health hospitals are made - women and children (including patients, sub-healthy people, and healthy people in need) are the main service targets, and active medical care services for women and children is provided

throughout the life cycle. Focus strategy is the best choice to improve the core competitiveness of SD Maternal and Child Healthcare Hospital.

The SWOT matrix analysis method is used to analyze the internal competitive strengths, internal weaknesses, external opportunities and external threats of SD Maternal and Child Healthcare Hospital, thereby proposing the development strategy of the hospital.

Strategic thinking: supplement VRIO resources and capabilities, enhance dynamic capabilities, and construct a unique hospital culture. Specific strategic measures include:

1. Supplement VRIO resources and capabilities:

① Build an elite talent system and improve the quality of hospital's decision-making group;

② Strengthen the construction of informatization and build a smart hospital;

③ Establish a hospital client relationship management system and build a marketing service network;

④ Create a discipline brand featuring maternal and child healthcare, and establish a regional diagnosis and treatment center of difficult and critical illness for women and children;

⑤ Establish a regional maternal and child health care alliance to enhance regional radiation capabilities.

2. Enhance dynamic capabilities

① Establish a learning hospital;

② Establish a specialty operation department to build a new hospital management and operation system;

③ Build a maternal and child medical center and an innovative medical practice system;

④ Build an integrated medical care service system with health as the core;

⑤ Constructing the whole life cycle health management service chain for women and children.

3. Construct unique hospital culture

① Building a caring culture with patients as the priority;

② Create a hospital culture that encourages innovation and tolerates failure;

③ Strengthen the management and dissemination of culture.

The results of this study can be used as a reference for Chinese maternal and child healthcare hospitals to enhance its core competitiveness strategy.

6.2.3 What is the important role of enhancing the core competitiveness of maternal and child health care hospitals in an environment of reform?

Through data survey, the national performance ranking of the six hospitals in 2018 was obtained, which follows such order from high to low: H1, H6, H2, H5, H3, H4; the evaluation model of core competitiveness of maternal and child healthcare hospitals set up in this study ranks the six hospitals based on the overall assessment method, weighted by the TOPSIS method, offering a ranking from high to low as follows: H1, H6, H2, H3, H4, H5; according to correlation analysis, the correlation coefficient is greater than 0.8 ($P < 0.05$), suggesting a significant positive correlation.

The national performance ranking, to some extent, reflects the comprehensive strength of maternal and child healthcare hospitals and the development requirements for maternal and child healthcare hospitals. The results indicate that maternal and child healthcare hospitals with strong core competitiveness rank high in relevant nationwide industry rankings, and are consistent with the development guidance issued by the state.

Additionally, the study found that, in 2018, H1, H6 and H2 have relatively higher national performance ranking and overall score of core competitiveness as well as greater proportion of remote patients, and higher degree of patient satisfaction and employee satisfaction. Therefore, maternal and child healthcare hospitals with stronger core competitiveness can attract customer resources and have stronger radiation capability of medical services.

Furthermore, based on expert interviews and key factors analysis of SD Maternal and Child Healthcare Hospital in the past 10 years, we found that, in 2012, 2017 and 2019, the hospital had done a great job in terms of such indicators as outpatient and inpatient visits, net profit, patient satisfaction and employee satisfaction. So we believe that the hospital has had competitive advantage in recent years. In 2012, the IVF (in-vitro fertilization) technology was officially launched, filling the gap in the field of reproductive specialty in Shunde. In 2017, key specialty of pediatrics, reproductive department, and gastrointestinal anorectal surgery were established in Foshan, thus improving the medical level of such three specialized fields. In 2019, experts were introduced to establish the blood institute and the respiratory disease institute for children, so as to improve the level of disciplinary and scientific research. These key factors are all important indicators of the improvement of the hospital's core competitiveness. The results suggest that the improvement of core competitiveness can attract more customers to achieve higher economic benefits, as well as higher social benefits (employee and patient satisfaction),

which can bring competitive advantage to maternal and child healthcare hospitals in the new era.

Therefore, enhancing core competitiveness is more likely to bring competitive advantages to maternal and child healthcare hospitals in the new era, promote long-term performance growth of hospitals, and gain a leading position in health care.

6.3 Major conclusions

Based on the case study of SD Maternal and Child Healthcare Hospital and the research on the six public tertiary grade-A maternal and child healthcare hospitals in China, the following conclusions can be made.

6.3.1 Redefining the core competitiveness of Chinese medical institutions and Chinese maternal and child healthcare hospitals

The core competitiveness of Chinese medical institutions, and maternal and child health hospitals is defined as follows: the organic combination of a series of complementary VRIO resources and organizational capabilities, dynamic capabilities, and hospital culture. It is the overall operation capability of the hospital achieved through the integration of unique hospital culture and management. Among them, VRIO resources and organizational capabilities are the carrier and foundation of the hospital's core competitiveness. The unique hospital culture is the driving force for the construction of the hospital's core competitiveness, and dynamic capabilities are necessary to the formation of the hospital's core competitiveness.

The constituent elements of the core competitiveness of Chinese maternal and child healthcare hospitals include: human resources, social resources, information resources, district management capabilities, medical service capabilities, technical service innovation capabilities, strategic management capabilities, and unique hospital culture.

The application of specialized strategy, the district management ability and the ability to build an integrated medical and health care service system are important core competitiveness elements with the characteristics of maternal and child health hospitals.

6.3.2 Preliminary discussion on the strategic countermeasures to enhance the core competitiveness of SD Maternal and Child Healthcare Hospital

Different hospitals have different resources and capabilities. The hospital should construct a suitable development strategy according to its own actual situation and to determine the key measures of cultivating core competitiveness.

Based on the analysis of the internal and external environment of SD Maternal and Child Healthcare Hospital as well as relevant research on the customer demand and market orientation of the maternal and child healthcare hospitals in China, due to the fact that the service area, patients and the treated diseases in maternal and child healthcare hospitals are relatively fixed, the medical services provided in such hospitals are often specialized. Therefore, they should adopt specialized strategies to enhance their core competitiveness. Main approaches include supplement VRIO resources and organizational capabilities, enhance dynamic capabilities, and build unique hospital culture; specific measures include: build a learning hospital, construct an elite talent system and gather high-level talents; innovate management and service capabilities, build smart hospital, establish a hospital client relationship management system; create a disciplinary brand featuring maternal and child healthcare, improving the ability to treat critical and difficult diseases ; form an integrated medical care service system, set up a regional maternal and child health care alliance, and build a health management service chain for women and children throughout the life cycle; ; establish a Maternal And Child Medical Center and carry out high-level clinical research; build a culture of people-oriented and a culture that encourages innovation.

6.3.3 The capability of enhancing core competitiveness can bring competitive advantage to maternal and child healthcare hospitals in the new era

This study found that the hospital with a high overall score in the core competitiveness evaluation model is more or less superior to its competitors in some aspects, such as discipline construction, customer management, service quality and hospital culture. Furthermore, the more advanced a position the hospital holds, the stronger its core competitiveness or overall score is.

Improving the core competitiveness of maternal and child healthcare hospitals can enhance their comprehensive service capability, and promote medical services, so as to attract more customers and realize higher economic benefits. Higher degree of employee and patient

satisfaction can improve social benefits, thereby bringing competitive advantage to maternal and child healthcare hospitals in the new era.

The construction of the core competitiveness of the Maternal and Child Healthcare Hospital is also a continuous and dynamic process. Continuous innovation is the primary driving force for maintaining the hospital's development and an important manifestation of the improvement of dynamic capabilities. Only by adapting to the hospital's internal environment and external market changes, continuous change and innovation, can the sustainable development of the hospital be realized.

6.3.4 The scientificity and accuracy of the comprehensive evaluation model of Chinese maternal and child healthcare hospitals' core competitiveness

This research is based on organizational strategy, Resource-based View, Core Competitiveness Theory, and other theoretical foundations. Through Delphi method, the structure includes: human resources, information resources, social resources and branding, strategic management capabilities, technological service innovation, medical service capabilities, district management capabilities and cultural systems. This is a model with a total of 42 measurable evaluation indexes. In the model demonstration stage, the total scores were calculated and obtained by using the data of the core competitiveness evaluation model indicators of 6 maternal and child healthcare hospitals, which are scientific and accurate to a certain extent. The selected evaluation indexes are significantly representative, and the evaluation results are in line with the national assessment and relevant development requirements. H1 and H6, ranking high in the evaluation model proposed by this study, are maternal and child healthcare hospitals with relatively greater comprehensive strength. Further study is needed to expand the research scope and carry out cross-regional research.

6.4 Research contributions

6.4.1 Theoretical contribution

This study establishes an analysis model of the core competitiveness of Chinese maternal and Child Healthcare Hospitals in the new era to fill the gaps in related research fields.

The theoretical and empirical research on the core competitiveness of Chinese hospitals is an emerging topic still in a stage of continuous development. The research on the strategy of improving core competitiveness of Chinese maternal and child healthcare hospitals draws more

experience on the theory and practice of enterprise strategic management and in China, it has long been in a state of insufficient theoretical research vitality and lack of practical research guidance, as well as scientificity and operability. On the basis of fully absorbing the research results of the Competitive Advantage Theory on hospitals and enterprises both at home and abroad, this study made a preliminary exploratory research on the concept, constituent factors, improvement strategies and functioning mechanism in the new era of the core competitiveness of Chinese maternal and child healthcare hospitals. It also analyzed the connotation and extension of the core competitiveness of these hospitals from the perspective of resource, capability and culture, which is theoretically innovative.

This research builds the core competitiveness index system and model of Chinese maternal and child healthcare hospitals and provides scientific theoretical basis for these hospitals to enhance and cultivate competitiveness, which is conducive to filling the gaps in the research fields related to these hospitals' enhancement of their core competitiveness strategies.

6.4.2 Influence of hospital management

This study puts forward the core competitiveness improvement strategy of SD Maternal and Child Healthcare Hospital, which provide scientific basis and useful reference for the hospitals to formulate the sustainable development strategies and the government to formulate put health policies

This research formulates and implements a reasonable and scientific development strategy plan for the SD Maternal and Child Healthcare Hospital to improve the quality of the hospital's services to the people, embrace challenges brought about by the competition in the medical market, calmly face the government's requirements for hospital's upgrading and reform, meet the new needs of maternal and child healthcare under the new normal, and improve hospital operating efficiency, thus achieving sustainable development.

Through a window of the case study of SD Maternal and Child Healthcare Hospital, this research displays the development bottleneck of Chinese maternal and child healthcare hospitals and sorts out their shackles of development. This helps provide clues for the construction of sample hospitals and other current hospitals to further enhance their core competitiveness strategy, and also provides ideas and references for China to formulate reform supporting policies for public hospitals.

6.5 Limitations

For the limited research period and funding constraints, this research has certain limitations in design and analysis.

① Although there have already been plentiful literature and research results in the field of enterprise's strategic management to enhance core competitiveness, there is still a lack of more mature theoretical and practical foundations in the medical field, especially among Chinese maternal and child healthcare hospitals. In the research process, the study learns from the theory and practice of enterprise strategic management, as well as the core competence analysis of general hospitals. Although there were certain innovations in the field of maternal and child healthcare, and certain theoretical research index systems were formed, it still fails to break through the enterprise strategic management framework in the end.

There are certain differences between hospital management and enterprise management, and the maternal and child healthcare hospitals as specialized hospitals have their own particularity compared with general hospitals, so the core index system and implementation model of the hospitals still need to be further explored and continuously improved, so as to provide reference for hospital management researchers.

② In the process of data modeling, due to the differences in hospital management level and the actual level of information construction, the current data collection in this study was assisted by the hospital, which will inevitably cause human interference. Also, some data may involve the confidentiality of hospital operations, so hospital interviewees chose to retain key data for ensuring the confidentiality of commercial information, which makes it impossible to fully obtain the precise information required by the research. Some subjective indicators may contain the researcher's subjective understanding and include some random and accidental factors. As the medical big data continuously develops, and hospital informatization construction level constantly elevates, the scientificity and effectiveness of data will have been greatly improved by then, which will be more conducive to enhancing the scientificity and representativeness of research, and the model will be able to better reflect the core competitiveness of Chinese maternal and child healthcare hospitals.

③ Affected by objective conditions, this study selected 6 tertiary maternal and child healthcare hospitals in China, and conducted a free enumeration questionnaire survey of 25 experts across China. The research conclusions and related recommendations are drawn on the basis of the existing samples, which are insufficient to fully represent the level of maternal and

child healthcare hospitals. In this regard, it is still necessary to expand the research objects in the follow-up research, supplement with a large number of empirical studies, and conduct more extensive comparative analysis so as to analyze the development and functioning mechanism of Chinese maternal and child healthcare hospitals' core competitiveness in a more objective way.

6.6 Topics for future research

Based on the conclusions and limitations of this research, the author believes that the directions for follow-up research include:

① This research is only a preliminary attempt to introduce Resource Management Theory and Core Competitiveness Theory into the strategic management of Chinese maternal and child healthcare hospitals, but the constituent elements of core competitiveness and the influence mechanism of each element on competitive advantage still need further studies. In the follow-up research, the study of quantitative data should be strengthened, and more empirical research should be made so as to reveal the relationship between each element and core competitiveness. In this way, the research will better reflect the actual situation of the impact of the hospital's core competitiveness on its competitive advantages, thus providing more operational optimization strategies and suggestions for the development of Chinese maternal and child healthcare hospitals.

② Systematic research should be conducted on the strategic management of improving Chinese maternal and child healthcare hospitals' core competitiveness on a larger scale. This study was only conducted within a limited sample range, so it has certain limitations. In the follow-up research, different levels of hospitals in different regions and cities can be selected to conduct investigations so as to increase the scientificity of the research results and enhance the guidance on practice.

③ This study will regularly inspect the implementation process of SD Maternal and Child Healthcare Hospital's strategic planning through a specially established expert group, and conduct mid-term and final evaluations of key construction content according to the progress so as to test the degree and effect of the strategic planning, and find problems in time for providing scientific basis for the hospital to adjust and improve its strategic planning.

[This page is deliberately left blank.]

Bibliography

- Ansoff, H. I. (1965). *Corporate Strategy*. New York: McGraw-Hill.
- Ansoff, H. I. (1979). *Strategic Management*. London: Macmillan.
- Amit, R. & Schoemaker, P. J. H. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, 14(1): 33-46.
- Barnard, C. L. (1938). *The Function of the Executive*. Cambridge: Mass Harvard University Press.
- Barney, J. B. (1986). Organizational culture: Can it be a source of sustained competitive Advantage? *Academy of Management Review*, 11(3): 656-665.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17: 99-120.
- Barney, J. B. & Zajav, E. J. (1994). Competitive organizational behavior: Toward an organizationally-based theory of competitive advantage. *Strat Management*, 15(S1): 5-9.
- Barney, J. B. & Wright, P. (1998). On becoming a strategic partner: The role of human resources in gaining competitive advantage. *Human Resource Management review*, 37(1): 31-46.
- Barney, J. B. (2015). Firm resources and sustained competitive advantage. *Economics Meets Sociology in Strategic Management*, 10: 203-277.
- Barreto, I. (2010). Dynamic capabilities: A review of past research and an agenda for the future. *Journal of Management*, 36(1): 256-280.
- Barton, L. D. (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal*, 13: 111-125.
- Cardea, N. & António, N. (2012). Valuable, rare, inimitable resources and organization (VRIO) resources or valuable, rare, inimitable resources (VRI) capabilities: What leads to competitive advantage? *African Journal of Business Management*, 6(37): 10159-10170.
- Cavusgil, E., Serggie, S. H., & Talay, M. B. (2007). Dynamic capabilities view: Foundations and research agenda. *Journal of Marketing Theory and Practice*, 15(2): 159-166.
- Chandler, A. D. (1962). *Strategy and Structure: Chapters in The History of The American Industrial*. Cambridge: Mass Massachusetts Institute of Technology Press.
- Christensen, J. F. (2002). Corporate strategy and the management of innovation and technology. *Industrial and Corporate Change*, 2: 11.
- Chen, G. (2009). The theoretical origin, limitation and research prospect of core competence. *Commercial Times*, 17: 43-45.
- Chen, T., Min, R., Yue, Q., & Fang P. Q. (2017). A preliminary study on dynamic capability of large public hospitals under the background of healthy China construction. *Chinese Hospital Management*, 37(6): 1-4. In Chinese.
- Chen, W. X., Zhou, Y., Nie, D. F., Mao, M., & Su, W. (2010). The supply of maternal and child health services in the United States and its enlightenment to China. *Chinese Hospital Management*, (30): 208-211. In Chinese.
- Cheng, F. F. (2014). *Study on the management and child health care institutions in China*. Master Dissertation, Dalian Maritime University. In Chinese.
- Collis, D. J. & Montgomery, C. A. (2008). Competing on resources. *Harvard Business Review*, 86(7, 8): 140-150.
- Coombs, R. (1996). Core competence and strategic. *R&D Management*, 26(4): 346-355.

- Deng, X. Q., Wu, Y., Shang, G. C. X., & Wang, L.H. (2003). Investigation and analysis of core competency elements - based on Chinese journal full-text database. *Scientific Research Management*, 24(2): 109-115. In Chinese.
- Du, Z. Z.(2009). Some understandings about medical integration. *Medicine and Philosophy (Humanities and Social Medicine)*, 30(4): 3-7. In Chinese.
- Eisenhardt, K. M. & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10/11): 1105-1121.
- Gao, G.Y., Zhao, Y. X., Wan, Q. & Du, L.X. (2001). A study on maternal and child health costs in anhui province. *China's Health Economy*, 224(20): 31-34. In Chinese.
- Gu, L.P. (2018).Analysis of the current situation of maternal and child health in Australia. *Journal of Qiqihar Medical College*, (05): 576-577. In Chinese.
- Guo, T. J. (2006). *Research on competitiveness evaluation of non-profit hospitals*. Master Thesis, Central South University. In Chinese.
- Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review*, 33: 114-135.
- Gui, K. Q. (2014). *Deciphering Huaxi*. Beijing: Guangming Daily Press.
- Hannan, M. T. & Freeman, J. (1977). The polulation ecology of organizations. *American Journal of Sociology*, 82(5): 929-964.
- Hamel, G. & Prahalad, C. K. (1993). Strategy as Stretch and Leverage. *Harvard Business Review*, 71(2): 75-84.
- Hamel, G. & Prahalad, C. K. (1994). *Competing for the Future*. Boston: Harvard Business Shool Press.
- Hamel, G. (2000). *Strategic Flexibility Managing to a Turbulent Environment*. Beijing: Beijing Machinery Industry Press.
- Hitt, M. A. (2017). *Strategic Management* (Twelfth Edition, Translation of Business Administration Classics). Beijing: China Renmin University Press.
- Hou, W. B. (2016). *Accelerating the construction of Shaanxi's science and technology service institution alliance based on the strategic management theory*. Master Dissertation, Northwest University. In Chinese.
- Huang, A. P., Wu, Y. F. & Wu, G. Q. (2009). To guide the sustainable development of hospitals with strategic management. *China Healthcare Innovation*, 4(16): 122-123. In Chinese.
- Li, F. (2017). The policy analysis and countermeasure study of China's comprehensive opening to the second child. *The Operator*, 31(6): 396-397.
- Li, G. H. (2003). *Research on hospital performance management*. Doctorial Thesis, Fudan University. In Chinese.
- Li, H. B., Gu, J. M., Ding Y., Shen, L. & He, Q. M. (2011). Review and analysis of maternal and child health policies in China since the reform and opening up. *Chinese Health Policy*, 4(10): 48-54. In Chinese.
- Liu, Y. (2008). The implementation of hospital strategic management is the key to the construction of core competitiveness. *Chinese Health Service Management*, 2: 91-92. In Chinese.
- Lv, J. & Hao, M. (2008). *Strategies for promoting the development of maternal and child health*. Shanghai: Fudan University Press. In Chinese.
- Macmillan, I. C. (1978). *Strategy Formulation: Political Concepts*. St. Paul: West Publishing Company.
- Meyer, M. H. & Utterback, J. M. (1993). The product family and the dynamics of core capability. *MIT Sloan Management Review*, Sping: 29-48.
- Meng, Q. Y., Yin, D. X., Mills, A., & Abbasi K. (2019). Reform of China's medical and health care system: A review of the progress of the 10th anniversary. *The British Medical Journal*, 365: 14178.

- Michael, E. P. & Thomas, H. L. (2015). Why strategy matters now. *The New England Journal of Medicine*, 372: 1681-1684.
- Mintzberg, H., Ahlstrand, B., Lampel, J.(1998). *Strategy Safari: A Guided Tour Through the Wilds of Strategic Management*. Now York: Free Press.
- Newbert, S. L (2008). Value, rareness, competitive advantage, and performance: A conceptual-level empirical investigation of the resource-based view of the firm. *Strategic Management Journal*, 29(7): 745-768.
- Oliver, C. (1997). Sustainable competitive advantage: Combining institutional and resource-based views. *Strategic Management Journal*, 18(9): 697-713.
- Pang, H. (2010). *The design and realization of municipal maternal and child health information management system*. Master Dissertation, Shandong university. In Chinese.
- Pavitt, K. (2002). Innovating routines in the business firm: What corporate tasks should they be accomplishing? *Industrial and Corporate Change*, 11: 125.
- Peteraf, M. A. (1993). The cornerstones of competitive advantage: A resource based view. *Strategic Management Journal*, 14: 179-191.
- Porter, M. E. (1980). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press.
- Prahalad, C. K. & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3): 79-91.
- Prieto, I. M., Revilla, E., & Rodríguez-Prado, B. (2009). Building dynamic capabilities in product development: How do contextual antecedents matter? *Scandinavian Journal of Management*, 25(3): 313-326.
- Qiu, L., Li, H. M., & Ding, H.(2008). Overview of maternal and child health care system in Sweden and its enlightenment. *Capital Medical University*, (01): 62-64.
- Quan, X. M. (2008). *Study on strategic management of urban hospitals*. Doctorial Thesis, Huazhong University of Science and Technology. In Chinese.
- Quinn, J. B. (1980). *Strategic Change: Logical Incrementalism*. Homewood: Irwin.
- Raffa, M. & Zollo, G. (1994). Sources of innovation and professionals in small innovative firms. *International Journal of Technology Management*, 9: 481-496.
- Richard, W. H. & Provo, J. (2000). Knowledge, competence, and expertise in organizations. *Advances in Developing Human Resources*, 2: 1-7.
- Rumelt, R. P. & Teece, D. J. (1994). *Fundamental Issues in Strategy: A Reseach Agenda*. Cambridge: Harvard Business Press.
- Selznick, P. (1957). *Leadership in Administration: A Sociological Interpretation*. New Yorker: Harper & Row.
- Schulte, W. D. (1999). *The effect of international corporate strategies and information and communicaiton technologies on competitive advantage and firm performance: an exploratory study of the international engineering, procurement and construction (iepc) industry*. Doctorial Thesis, The George Washington University.
- Schumpeter, J. A. (1934). *The Theory of Economic Development*. London: Oxford University Press.
- Simon, H. A. (1947, 1958). *Administrative Behavior*. New York: Macmillan.
- Song, D. D. (2015). *Diversified transformation and development of China railway based on the corporate strategic management theory*. Doctorial Thesis, China Academy of Railway Science. In Chinese.
- Su, L. (2019). *Study on the satisfaction of outpatient/inpatient of a grade a hospital in Shenyang on the medical service after the new medical reform*. Master Dissertation, China Medical University. In Chinese.

- Sun, L. P. (2017). *Research on evaluation index system of development capacity of county-level maternal and child health institutions*. Master Dissertation, Chinese Center for Disease Control and Prevention Maternal and Child Health Center. In Chinese.
- Teece D. C., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7): 509-533.
- Teece, D. J. (2007) Explicating Dynamic Capabilities: The Nature and Micro Foundations of (Sustainable) Enterprise Performance. *Strategic Management Journal*, 28: 1319-1350.
- Teece, D. C. (2014). A dynamic capabilities-based entrepreneurial theory of the multinational enterprise. *Palgrave Macmillan: Academy of International Business*, 45(1): 8-37.
- Wang, D. & Huang, D. H. (2014). *Enterprise management of non-profit hospital: learn management from chang gung hospital*. Beijing: Chemical Industry Press. In Chinese.
- Wang, F. (2007). *Research on the evaluation of national competitiveness based on resource-based theory*. Master Dissertation, Tianjin University. In Chinese.
- Wang, X. D. (2003). What is the hospital core competitiveness? *People's Liberation Army Hospital Management Journal*, 10(3): 264-267. In Chinese.
- Wang, Y. (2016). *Development strategies of QY women and children specialized hospital under the context of medical reform*. Master Dissertation, Yunnan Normal University. In Chinese.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5: 171-180.
- Wu, M. & Li, S. X. (2010). Analysis of integrated medical and health service system. *Journal of Medicine and Philosophy*, 31(4): 9-10, 16. In Chinese.
- Wu, J. J. (2009). *Fundamental analysis and evaluation of public hospital competitiveness*. Doctorial Thesis, Nanchang university. In Chinese.
- Xiang, B. H. (2007). *Strategic Management - Art and Pragmatism*. Shanghai: Fudan University Press. In Chinese.
- Xu, C. W. (2016). *Beyond Competition: Inspiration From Hospital Management Cases*. Guangzhou: Guangdong People's Publishing House. In Chinese.
- Yang, C. X. (2011). *Research on analysis and comprehensive evaluation system of hospital core competence*. Doctorial Thesis, Central South University. In Chinese.
- Yang, L. (2007). *Research on the analysis model of core competence of Chinese hospitals*. Doctorial Thesis, Third Military Medical University. In Chinese.
- Zhu, H., Zhang, G. Q., Liao, S. W., Li, X., & Tan, B. H. (2019). Research on the role of cultural construction in strengthening the core competitiveness of hospitals. *China Medical Herald*, 16(15): 172-180. In Chinese.
- Zhu, Y. Z. & Liu, L. X. (2000). Cultivate the core competitiveness and promote the sustainable development of the hospital. *Health Economics Research*, 12: 11-12. In Chinese.
- Zhu, Z. F., Wang, Y., Wang, L. S., & Zhang, R. K. (2014). The errors and countermeasures of the existing functional orientation of maternal and child health care institutions. *Chinese Journal of Hospital Management*, 30(8): 606-607. In Chinese.
- Zhang, J. & Sun, T. (2019). Dynamic capabilities of public hospitals in uncertain environments: a conceptual framework. *Chinese Hospital Management*, 39(6): 3-6, 15. In Chinese.
- Zhang, Q. (2017). *Research on the measurement method of enterprise resource allocation harmony degree*. Master Dissertation, Hebei University of Technology. In Chinese.
- Zhao, W. (2004). *Research on competitiveness evaluation and cultivation of large comprehensive hospitals*. Doctorial Thesis, Chongqing University. In Chinese.
- Zhuang, Y. Q. Liao, X. B., Wang, X. L., & Yao, S. F. (2019). *Annual Report on China's Hospital Competitiveness (2018-2019)*. Beijing: Social Sciences Academic Press. In Chinese.

Webliography

- Chen, L. Y. (2018, April 22). *According to the 2018 white paper on medical institutions for women and children in China, women's maternity hospitals may be further reduced.* Retrieved August 7, 2019, from <http://news.eastday.com/s/20180422/u1ai11382278.html>. In Chinese.
- Du, T. (2019, January 26). *Excessive loss of pediatricians and difficult recruitment, child patients' difficulty in getting access to medical services demands prompt solutions.* Retrieved February 13, 2019, from <http://fashion.eastday.com/a/190126211433514.html>. In Chinese.
- Gao, H.B., Yang J., Lv, Z. B., Wan, H. J., Guo, Y. Q., Wei, J. H., et al. (2015, December 21). *China's Consumption Trends Report Three New Forces Leading the New Consumption Economy, AliResearch, The Boston Consulting Group.* Retrieved March 21, 2019, from <http://www.199it.com/archives/420464.html>. In Chinese.
- Institute for Global Industry, Tsinghua University. (April 19, 2019). *Dual-track dynamics: the future of china's health care industry.* Retrieved August 7, 2019, from <http://www.igi.tsinghua.edu.cn/userfiles/editor/201904191600288549.pdf>. In Chinese.
- Wang, D. B. (2014, June 12). *It is necessary to increase the amount of midwife with bachelor degrees.* Retrieved February 13, 2019, from http://news.ifeng.com/a/20140612/40702070_0.shtml. In Chinese.
- Ma, Z. C. (2016, August 20). *Xi Jinping: People's health should be placed at the strategic position for preferential development.* Retrieved January 18, 2019, from http://www.xinhuanet.com/politics/2016-08/20/c_1119425802.htm. In Chinese.
- Liu, B. Z., Zhao, X. H., & Zhang, Y. (2017, March 15). *A shortage of nearly 200,000 pediatricians in China.* Retrieved February 13, 2019, from <https://gaokao.chsi.com.cn/gkxx/zybk/201703/20170315/1591015306.html>. In Chinese.

[This page is deliberately left blank.]

Other References

- China's Ministry of Health. (2006). *Measures for Administration of MCH institutions*. Beijing, China's Ministry of Health. In Chinese.
- China's National Bureau of Statistics. (2009). *China Statistical Yearbook 2009*. Beijing, China's National Bureau of Statistics. In Chinese.
- China's National Bureau of Statistics. (2010). *China Statistical Yearbook 2009*. Beijing, China's National Bureau of Statistics. In Chinese.
- China's National Bureau of Statistics. (2011). *China Statistical Yearbook 2009*. Beijing, China's National Bureau of Statistics. In Chinese.
- China's National Bureau of Statistics. (2012). *China Statistical Yearbook 2009*. Beijing, China's National Bureau of Statistics. In Chinese.
- China's National Bureau of Statistics. (2013). *China Statistical Yearbook 2009*. Beijing, China's National Bureau of Statistics. In Chinese.
- China's National Bureau of Statistics. (2014). *China Statistical Yearbook 2014*. Beijing, China's National Bureau of Statistics. In Chinese.
- China's National Bureau of Statistics. (2015). *China Statistical Yearbook 2015*. Beijing, China's National Bureau of Statistics. In Chinese.
- China's National Bureau of Statistics. (2016). *China Statistical Yearbook 2016*. Beijing, China's National Bureau of Statistics. In Chinese.
- China's National Bureau of Statistics. (2017). *China Statistical Yearbook 2017*. Beijing, China's National Bureau of Statistics. In Chinese.
- China's National Bureau of Statistics. (2018). *China Statistical Yearbook 2018*. Beijing, China's National Bureau of Statistics. In Chinese.
- Department of Maternal and Child Health Care. (2019). *Report On the Development of Maternal and Child Health in China*. Beijing, Department of Maternal and Child Health Care. In Chinese.
- Department of Medical Administration. (2016). *Notice of Issuing Opinions on Strengthening Reform and Development of Children Medical Health Services*. Beijing, Department of Medical Administration. In Chinese.
- State Council. (2018). *Report on the Work of the Government*. Beijing, State Council. In Chinese.
- State Council. (2016). *"Healthy China 2030" Blueprint*. Beijing, State Council. In Chinese.

[This page is deliberately left blank.]

Annex A

Questionnaire of Free Listing: Evaluation Indicators of Core Competitiveness of Maternal and Child Healthcare Hospitals

Please list relevant indicators which, in your opinion, may affect core competitiveness of maternal and child healthcare hospitals:

You may list in the back side in case there is insufficient blank space.

Thanks again for your precious opinion.

[This page is deliberately left blank.]

Annex B

Questionnaire of Expert Consulting: Evaluation Indicators of Core Competitiveness of Maternal and Child Healthcare Hospitals

Distinguished expert,

Hello. Thank you very much for sparing the time to fill in this questionnaire.

This survey invites you to evaluate indicators in “Core Competitiveness of Maternal and Child Healthcare Hospitals: Expert Consulting Table”. Please be noted that:

1. Introduction of Core Competitiveness of Maternal and Child Healthcare Hospitals were showed next page.

2. Please provide your general information, choose indicators' identification features and importance level. Please put ticks “√” for your choices.

3. Indicators' identification features include value, rarity, inimitability and organization. You may make multiple choices if the indicators have the four features (or you can make a single choice based on your judgment). If you consider that the indicators do not have any feature, please offer your suggestions on revision in the blank.

4. This survey is only used for this topic research. Please fill in the questionnaire according to the notes.

Thank you for your support. Best regards!

[This page is deliberately left blank.]

Annex C

Introduction of Core Competitiveness of Maternal and Child Healthcare Hospitals

Core competitiveness is the basis of a hospital for acquiring constant competitive advantages. Not all resources, knowledge or technology can form core competitiveness of the hospital unless they have the features of core competitiveness and are appropriate for the hospital's individualized development process.

The features of core competitiveness include **value, rarity, inimitability and organization (VRIO)**.

Value means the long-term and stable market demands and the medical operation at a high-quality level in a short period.

Rarity asks if such valuable carriers that are able to create competitive advantages are only held by a small number of medical institutions.

Inimitability indicates the key medical technology or capabilities having extremely strong characteristics and advantages and are rarely imitable or replaceable.

Organization implies medical institutions' organizational capabilities to effectively develop utilize and manage these valuable, rare and inimitable objects.

Through literature review, we proposed that evaluation indicators of maternal and child healthcare hospitals mainly involve five dimensions: **tangible resources, intangible resources, dynamic capabilities, static capabilities and hospital culture**.

[This page is deliberately left blank.]

Annex D

Questionnaire: General Information of Expert

1. Your name: _____
2. Your gender: male female
3. Your age: _____ years old
4. How many years have you been working?
 <10 years 10-19 years ≥20 years
5. Your educational level:
 Doctor Master Bachelor Lower than bachelor
6. Your professional title:
 Senior title Associate senior title Intermediate title
7. Your position:
 Senior hospital administrator Middle hospital manager
 Researcher of health management
8. Your post:
 Hospital senior administrator Hospital middle-level administrator
 Researcher on health management others _____
9. Please choose your familiarity with Grade One indicators and judgment standards:

Table d.1 Grade One Indicators: Familiarity and Judgment Standards

Grade One Indicators	Familiarity 1-5					Judgment Standards				
	5 Very familiar	4 Relatively familiar	3 Generally familiar	2 Quite unfamiliar	1 Unfamiliar	Theoretical analysis	Practical experience	Literature	Peer study	Intuitive feeling
1. Tangible resources										

2. Intangible

resources

3. Dynamic

capabilities

4. Organizational

capabilities

5. Hospital

culture

Annex E

Expert Grading Questionnaire of “Evaluation Index System for Core Competitiveness of Maternal and Child Healthcare Hospitals”

This survey invites you to evaluate indicators in “Core Competitiveness of Maternal and Child Healthcare Hospitals: Expert Consulting Table”. Indicators’ identification features include value, rarity, inimitability and Irreplaceable. You may make multiple choices if the indicators have the four features (or you can make a single choice based on your judgment). If you consider that the indicators do not have any feature, please offer your suggestions on revision in the blank. Please put ticks “√” for your choices.

Table e.1 Core competitiveness of maternal and child healthcare hospitals: preliminary indicators based on expert grading

Core Competence Expert Rating Index Set of Maternal and Child Health Hospital				
			Identification Features	Importance to Core Competitiveness
Index system composition			Value	Extremely important
			Rarity	Important
			Inimitability	Generally important
			Irreplaceable	Unimportant
				Extremely unimportant
Grade One	Grade Two	Grade Three		
I. Tangible resources	1. Human resources	1. The quality of the presidents and middle managers		
		2. Percentage of health technical professionals		
		3. Percentage of health technical professionals with a senior title		

		Identification Features			Importance to Core Competitiveness				
		Value	Rarity	Inimitability	Irreplaceable	Extremely important	Important	Generally important	Unimportant
Index system composition									
2. Material resources	4. Percentage of health technical professionals with a master's degree or above								
	5. Number of public health care professionals								
	6. Number of computer professionals								
	7. Number of hospital beds								
	8. Medical business building area								
	9. Percentage of medical equipment assets to fixed assets								
	10. Number of medical equipment worth over 200,000 RMB								
	11. Total amount of fixed assets								
	12. Level of electronic medical record								
	3. Information resources	13. Maturity of hospital information connectivity							

		Identification Features			Importance to Core Competitiveness					
		Value	Rarity	Inimitability	Irreplaceable	Extremely important	Important	Generally important	Unimportant	Extremely unimportant
Index system composition										
		14. Grade of Intelligence based Medicine								
		15. Security level of information system								
Suggestions for revision:										
II. Intangible resources	1. Customer resources	16. Person-times of outpatient service								
		17. Person-times of inpatient service								
		18. Population of health examination(including pre-pregnancy eugenics, two cancers screening and student physical examination)								
	2. Social relationship resources	19. The number of postdoctoral mobile stations, doctoral stations, number of authorization point for master's degree, number of doctoral								

		Identification Features			Importance to Core Competitiveness					
		Value	Rarity	Inimitability	Irreplaceable	Extremely important	Important	Generally important	Unimportant	Extremely unimportant
Index system composition										
		supervisor and master supervisor								
		20. The number of teaching per person per year								
	3. Brand reputation	21. Public credit: One-vote veto, any violation of medical ethics								
		22. Brand influence Hospital certification program, professional association, provincial award or above								
		23. Satisfaction of patients								
Suggestions on revision:										
		24. Hospital goals and medium-and long-term developmental plan								
		25. Talent introduction mechanism								
		26. Personnel incentive mechanism								
III. Dynamic capabilities	1. Strategic management capabilities									

	Identification Features					Importance to Core Competitiveness			
	Value	Rarity	Inimitability	Irreplaceable	Extremely important	Important	Generally important	Unimportant	Extremely unimportant
Index system composition									
2. Technological innovation capabilities	27. Discipline construction level								
	28. Scientific research projects per 100 health technicians								
	29. Proportion of supporting scientific research funds to total funds expenditure								
	30. Number of new technology and new business projects per year								
	31. Ratio of major clinical specialties of national and provincial / total specialties								
	32. Number of articles published in core journals or impact factors / number of staff								
	33. Establish a "health" centered service sector								
	34. Integrated health care services								

		Identification Features			Importance to Core Competitiveness					
		Value	Rarity	Inimitability	Irreplaceable	Extremely important	Important	Generally important	Unimportant	Extremely unimportant
Index system composition										
4 Learning capability		35. Providing service during whole process of birth								
		36. Proportion of education and training expenditure to total expenditure								
		37. Per capita cost of continuing medical education								
		38. Person-times of going out to study								
	5. Medical marketing capability	39. Proportion of live births in the hospital to live births per year in jurisdiction								
		40. Hospital reputation index								
		41. Growth rate of new patients per year								
Suggestions on revision:										
IV. 1. Medical service capacities		42. DRG per year								
		43. CMI of inpatient per year								

	Identification Features		Importance to Core Competitiveness						
	Value	Rarity	Inimitability	Irreplaceable	Extremely important	Important	Generally important	Unimportant	Extremely unimportant
Index system composition	55. Maternal system management rate in the jurisdiction								
	56. Regular screening rate of common diseases among women in the jurisdiction								
	57. Target population pre-pregnancy eugenic health check coverage								
	58. Screening rate of neonatal genetic and metabolic diseases in the jurisdiction								
	59. Coverage of health education activities in the jurisdiction								
3. Operational management capabilities	60. Annual inpatient cost consumption index								
	61. Annual inpatient time consumption index								
	62. Growth rate of business profit								
	63. Asset-liability ratio								

		Identification Features			Importance to Core Competitiveness					
		Value	Rarity	Inimitability	Irreplaceable	Extremely important	Important	Generally important	Unimportant	Extremely unimportant
Index system composition										
		71. Employee (staff) annual income growth rate								
Suggestions on revision:										
V. Hospital culture	1. Image culture	72. Unified VI system (hospital micro, hospital flag, hospital logo, hospital song)								
	2. Behavior culture	73. Service standard, service measures, service brand								
	3. System culture	74. Supporting ISO and JCR for cultural construction								
	4. Spiritual culture	75. core values, mission and vision of hospital								
Suggestions on revision:										

Illustrations:

1. Quality of presidents and middle managers: Comprehensive quality index of senior managers = average management years / average age ×150+150- average age ×2
2. Grade of Intelligence based Medicine: whether there is the service mode of "Internet + maternal and child health service" improve the medical treatment experience? online diagnosis

and treatment appointment, reminder of waiting for medical treatment payment and other services shall be provided through WeChat public account or APP.

3. Security level of information system: whether there is firewall, hardware anti-virus walls, VPN, intrusion detection, audit equipment, network monitoring mail gateway.

4. The number of teaching per person per year: Including the number of residents training, training doctors, teaching interns.

5. Public credit: The four elements of the one-vote veto include no fraudulent insurance, no false advertising, no fraudulent patients (false examination, no disease admission, arbitrary charges, etc.) and no first-class medical malpractice, and any violation of medical ethics principles.

6. Construction level of discipline: The construction level of a discipline = total weight +CMI+ middle and senior talents. The comprehensive index of the discipline construction in the hospital can be obtained by integrating the scores of various disciplines

7. Establishing a "Health" centered service sector:

Evaluation content includes the followings:

(1) According to the "Guidelines for the Establishment of Business Departments of Maternal and Child Health Service Agencies at All Levels" (Nation Health Office of Women and Children [2015] No. 59), and completing the internal reform and reorganization, standardizing the establishment of the maternal health care department, women's health care department and child care department, etc.

(2) Setting up clinics with health care features to meet the health needs of women and children.

(3) Completing the transformation of "people-centered" service mode.

(4) Completing the employment of internal personnel in the "large ministry system".

(5) Establishing an internal performance evaluation system based on the "big department system".

8. Integrating health care services: Evaluation content includes the followings:

(1) There are medical and health service referral system and process.

(2) Assessing the situation of patients, identifying their needs, and proactively providing appropriate referral services for patients. For example: gynecology and obstetrics outpatient and inpatient referral to women health care or maternity health care to receive nutrition, psychological, rehabilitation, traditional Chinese medicine health care services; Pediatric

outpatient and inpatient patients were referred to child health care for nutrition, psychology, rehabilitation, traditional Chinese medicine health care and other health care services.

(3) Providing referral guidance for the patient, including the name of the referral department, contact information, time of house call, etc. For example: issuing a referral form.

(4) training the staff and strengthening the service concept of combining clinical and health care.

(5) Achieving good integration effect. Outpatient referral rate = outpatient referrals/total outpatient and emergency visits per year; Inpatient referral rate = inpatient referrals/total inpatient referrals per year.

9. Service during whole process of birth: There are clear policies and procedures to integrate pre-pregnancy health care, pregnancy health care, in-patient delivery, postpartum health care, and child health care, and to provide systematic and standardized whole-process services for healthy births and good parenting, so as to build a "through-train" service chain one-station service

10. DRG per year: The DRG-grouping data of cases using the DRG grouper in that year were uploaded, bigger number means that broader coverage of diagnosis and treatment services were provided by the hospital.

11. Hospitals case mix indexes (CMI) per year: A hospital's CMI represents the average diagnosis-related group relative weight for that hospital, which weigh total cases of hospital patients. Higher CMI means that more difficult cases were admitted.

12. Maternal mortality rate within jurisdiction:

Maternal mortality rate = the number of maternal deaths / 100,000 live births during the last 3 years.

13. Infant mortality rate within the jurisdiction:

The infant mortality rate within the jurisdiction = the number of infant deaths / the number of live births in the jurisdiction during the last 3 years $\times 1000\%$

14. Participation rate of medical personnel with professional guidance in the jurisdiction: the number of medical personnel who provided professional guidance for primary hospitals / the total number of medical personnel in the hospital $\times 100\%$.

15. Systematically management rate of pregnant women and parturients within the jurisdiction:

Systematicly management rate of pregnant women and parturients = the number of pregnant women and parturients who were systematicly managed / the number of live births within the jurisdiction in statistical year $\times 100\%$, the number of pregnant women and parturients who were systematicly managed, which is regarded as the number of women who undertook first trimester prenatal examination during pregnancy and day 7 postpartum, at least 5 times antenatal examinations, give birth in hospital and postpartum visit.

16. Regular screening rate of women with common diseases within the jurisdiction:

Regular screening rate of women with common diseases within the jurisdiction = the actual number of patients checked up / total number of women checked up within the jurisdiction in that year $\times 100\%$; the actual number is regarded as the number of women aged 20 to 64 years within the jurisdiction in statistical year who were actually screened, the total number is represented as the number of women aged 20 to 64 years within the jurisdiction in statistical year who should be screened.

17. Pre-pregnancy eugenics health examination coverage: Pre-pregnancy eugenics health examination coverage rate of target population = pre-pregnancy eugenics health examination number / total target population $\times 100\%$

Coverage of pre-pregnancy eugenic examinations: Coverage rate of pre-pregnancy eugenic examinations in target population = the number of pre-pregnancy eugenic examinations / the total number of target population $\times 100\%$

18. Genetic and metabolic diseases among newborns: Neonatal screening rate of genetic metabolic disease = the number of newborns screened for genetic metabolic disease annually / the number of live births in the jurisdiction annually $\times 100\%$

19. Coverage of health education activities within the jurisdiction: The average reading volume of a single popular science article on WeChat public account

20. Rationality of organizational structure: The guidelines for setting up business departments of maternal and child health service institutions at all levels require whether the organizational structure and department setting are standardized

Table e.2 Grade Two Indicators

		Identification Features			Importance to Core Competitiveness				
		Value	Rarity	Inimitability	Irreplaceable	Quite important	Important	Generally important	Unimportant
Structure of Indicator System									
	Grade One indicators	Grade Two Indicators							
	1. Tangible resources	1-1 Human resources							
		1-2 Material resources							
		1-3 Information resources							
Suggestions on revision:									
	2. Intangible resources	2-1 Customer resources							
		2-2 Social relationship resources							
		2-3 Brand reputation							
Suggestions on revision:									
	3. Dynamic capabilities	3-1 Strategic management capability							
		3-2 Technological innovation capability							

Table e.3 Grade One indicators

Structure of Indicator System	Identification Features			Importance to Core Competitiveness					
	Value	Rarity	Inimitability	Irreplaceable	Quite important	Important	Generally important	Unimportant	Quite unimportant
Grade One indicators	1. Tangible resources								
	2. Intangible resources								
	3. Dynamic capabilities								
	4. Organizational capabilities								
	5. Hospital culture								

Annex F

Questionnaire on Customer Demands of SD Women and Children's Hospital

Hello.

This questionnaire is designed for acquainting with the masses' demands for medical services, improving the hospital's service level, maximizing social benefits, and constantly building and raising the hospital's core competitiveness. It may take about five minutes to fill in this questionnaire. Filling in this questionnaire is deemed to be your consent with participation in this survey. **Please answer each question in this questionnaire in an objective and earnest manner. Thank you very much for your great support to Shunde Women and Children's Hospital.**

Please put ticks “√” for your choices.

A1. Your gender: 1. Male 2. Female

A2. You are from: _____ County (City, District), _____ City

A3. Your age: _____ years old

A4. Your marital status:

1. Unmarried 2. Married 3. Divorced 4. Widowed 5. Remarried

A5. Your job:

1. Administrative staff 2. Professional/technician 3. Clerk

4. Labor worker / service staff 5. Farmer 6. Soldier

7. Private business owner 8. Staff of public security bureau, procuratorate and court

9. Unemployed 10. Student 11. The emeritus and retired

12. Others

A6. Your educational level:

1. Illiterate / semi-illiterate 2. Elementary school 3. Junior high school

4. Senior high school and vocational school 5. Technical secondary school

6. Junior college 7. University or above

A7. How far is your home from Shunde Women and Children's Hospital?

1. < 1km 2. 1km – 2km 3. 2km – 3km

4. 3km – 4km 5. 4km – 5km 6. \geq 5km

A8. Have you or your family ever been to Shunde Women and Children's Hospital for medical treatment?

1. Yes (please answer Question A10-1) 2. No

A9. What aspects do you hope to be improved by Shunde Women and Children's Hospital?
(Please choose three answers)

1. Service convenience 2. Improving medical level 3. Increasing specialist doctors
4. Medical environment 5. Shortening waiting time for medical treatment 6.
Increasing medical examination equipment 7. Improving service attitude 8. Clear
consumption details 9. Others (please note)

A10-1. Reasons for choosing Shunde Women and Children's Hospital for medical treatment
(choose three answers):

1. Good hospital image and sound reputation 2. Acquainted and trusted doctors
3. Recommended by relatives and friends 4. Convenient transportation
5. Reasonable charges 6. Advanced medical equipment
7. High medical level 8. Designated unit (such as social security)
9. Others (please note) _____

A10-2. The most important factors for your choosing Shunde Women and Children's Hospital
(choose four answers):

1. Saving time 2. Low price 3. Convenient transportation
4. Good service attitude of medical workers 5. Hospital reputation
6. Medical technological level 7. Convenient medical treatment
8. Favorable medical environment 9. Planned charges and transparency
10. Advanced medical equipment

A11. From which channel do you hope to learn more about Shunde Women and Children's Hospital (choose two answers):

1. Newspaper
2. Relatives and friends
3. TV
4. Propaganda leaflet
5. Charity clinics
6. Health lectures
7. Others (please note) _____

A12. Except for Shunde Women and Children's Hospital, in general, which hospitals do you choose for medical treatment? (Choose four answers)

1. The First People's Hospital of Foshan
2. Shunde District People's Hospital
3. Foshan Women and Children's Hospital
4. Guizhou Hospital
5. Longjiang Hospital
6. Shunde District Hospital of Chinese Medicine
7. Daliang Hospital
8. Beijiao Hospital
9. New Rongqi Hospital
10. Other Grade Three Level A hospitals in Guangzhou
11. Others (please note) _____

A13. What information about hospitals do you hope to learn? (Choose three answers)

1. Department profile
2. Expert profile
3. Medical project profile
4. Examination equipment and project profile
5. Medical expense profile
6. Disease prevention and healthcare knowledge
7. Others (please note) _____

A14. In your opinion, what are the most important factors during medical treatment process? (Choose five answers)

1. Good services
2. Medical safety
3. Being respected
4. Curing disease and relieving pain
5. Convenience
6. Quick services
7. Caring from doctors and nurses
8. Right to know and choose diagnostic plans
9. Favorable medical environment
10. Reasonable drug use and examination
11. Privacy protection

A15. What services do you hope to be provided by Shunde Women and Children's Hospital? (Choose two answers)

1. Telephone follow-up after discharge
2. Appointed medical treatment
3. Establishing personal health records
4. Providing VIP services
5. Others (Please note)

A16. Do you know about the new hospital of Shunde Women and Children's Hospital?

1. Yes. I'm looking forward to its being put into operation as soon as possible.

2. Yes. But I'm worried about rise in medical expense.
3. Yes. But I hope the hospital will not be relocated.
4. No.

A17. What kind of medical workers do you prefer? (Single choice)

1. Those who are excellent in medical skills but average in medical ethics.
2. Those who are average in medical skills but good in medical ethics.

A18. What would you do when seeking for medical treatment? (Single choice)

1. I would firstly choose hospital and then select doctor.
2. I would firstly choose doctor. Hospital doesn't matter.
3. Neither doctor nor hospital matter.

A19. You would regard Shunde Women and Children's Hospital as the _____ for curing women and children's general diseases. (Single choice)

1. First choice
2. Second choice
3. Count it out

A20. You would regard Shunde Women and Children's Hospital as the _____ for curing women and children's special or serious diseases. (Single choice)

1. First choice
2. Second choice
3. Count it out

A21. You prefer Shunde Women and Children's Hospital to become a:

1. Hospital for the convenience of the people
2. Trustworthy hospital
3. Low-price hospital (choose one out of the first three answers)
4. High-tech specialist hospital

Annex G

Staff Questionnaire of SD Women and Children's Hospital

Hello.

A hospital's development would be impossible without workers' support and participation. Your answers to the following questions will help us have a better understanding on hospital administration so that we are able to improve operation and management in a targeted manner. This questionnaire is anonymous. It may take about five minutes to fill in this questionnaire. Filling in this questionnaire is deemed to be your consent with participation in this survey. **We are deeply grateful to you for your cooperation and comment.**

Please put ticks “√” for your choices.

B1. Your gender: 1. Male 2. Female

B2. Your age: _____ years old

B3. Your marital status:

1. Unmarried 2. Married 3. Divorced 4. Widowed 5. Remarried

B4. Your educational level:

1. Senior high school / technical secondary school or below

2. Junior college 3. University 4. Master or above

B5. Your professional title:

1. Senior level 2. Middle level 3. Primary level

B6. Your job:

1. Medical worker 2. Nursing personnel

3. Administrative staff 4. Logistics personnel

B7. In general, are you satisfied with the hospital's current operation and management?

1. Very satisfied
2. Satisfied
3. Basically satisfied
4. Unsatisfied
5. Not sure

B8. Are you satisfied with your current status of work?

1. Very satisfied
2. Satisfied
3. Basically satisfied
4. Unsatisfied
5. Not sure

B9. Are you clear about the hospital's development goals in the next three years?

1. Very clear
2. Basically clear
3. I know there are some goals but I'm not quite clear about them.
4. There is no goal

B10. Are you clear about the hospital's annual work goals?

1. Very clear
2. Basically clear
3. I know there are some goals but I'm not quite clear about them.
4. There is no goal

B11. Are you clear about the annual work goals of your department?

1. Very clear
2. Basically clear
3. I know there are some goals but I'm not quite clear about them.
4. There is no goal

B12. Do you set clear personal work goals every year?

1. Yes
2. Sometimes I will
3. No

B13. How do you think of the hospital's management systems, relevant policies or work procedures?

1. Very specific
2. Relatively specific
3. Mostly specific
4. Rarely specific

B14. How do you think of the hospital's performance evaluation?

1. It is extremely incentive.

2. To some extent, it is incentive.
3. Indicators are unclear and are difficult to be incentive.
4. It totally goes through the motions.

B15. How do you think of the hospital's salary?

1. It is uncompetitive in the district.
2. It is competitive in the district.
3. It is unfair in internal distribution.
4. It is fair in internal distribution.

B16. What do you think are the factors that exert the most influence on your job performance? (Choose three answers)

1. Higher salary
2. More exciting jobs
3. Good interpersonal relationship
4. Learning opportunities
5. Opportunities for promotion and development
6. Favorable employee benefits
7. Stable job
8. Being respected by superiors and colleagues
9. Favorable work environment

B17. Have you even thought of quitting your job?

1. Yes
2. Wait and see
3. I won't quit my job

B18. How do you think of the hospital leaders' implementation and management?

1. They strictly implement the hospital's systems.
2. They basically implement the hospital's systems.
3. They rarely implement the hospital's systems.
4. Basically, it varies from person to person.

B19. How often do your superiors discuss with you on how to improve work to raise performance?

1. Often
2. Sometimes
3. Never

B20. What do you think are the hospital's advantages at present? (You may choose three answers at most)

1. Technology
2. Services
3. Management
4. Equipment
5. Talent
6. Quality
7. Hospital culture
8. Brand image

9. Geological location 10. Others _____

B21. What do you think are the hospital's disadvantages at present? (You may choose three answers at most)

1. Technology 2. Services 3. Management 4. Equipment
5. Talent 6. Quality 7. Hospital culture 8. Brand image
9. Geological location 10. Others _____

B22. In your opinion, it is the most urgent for the hospital to: (You may choose three answers at most)

1. Improve medical technological level.
2. Introduce modern medical equipment.
3. Introduce excellent professionals and technicians.
4. Raise management level.
5. Promote market publicity and marketing.
6. Enhance employee training.
7. Develop higher medical service level.
8. Others (please note) _____

B23. Which phenomenon do you think are relatively common in the hospital? (You may choose none of them or you may have multiple choices)

1. Employees are not aware of the market. They most often wait for, depend on and ask for outside support.
2. Employees are not aware of efficiency and are evasive and dilatory in business.
3. Many assigned tasks are not put into practice.
4. Employees are not aware of marketing and it is difficult for them to satisfy customers' demands.
5. There are quite a few meetings which deliver few significant results.
6. Many employees are not willing to be responsible for decision making.
7. Others (please note) _____

B24. How do you think of the hospital's future prospects?

1. Better 2. Almost the same 3. Worse 4. Not sure

B25. Does the hospital develop its own value concept?

1. No 2. Yes (please note) _____

B26. Does the hospital build its own spirit?

1. No 2. Yes (please note) _____

[This page is deliberately left blank.]

Annex H

Evaluation data questionnaire on the core competencies of maternal & child health hospital

Thank you very much for your participation in this survey!

The purpose of this survey is to invite your unit to fill in the data related to the core competencies of maternal & child health hospital. Please count the indexes and fill in them according to the filling instructions of corresponding items. This survey is for research purposes only, and the name of your unit will not appear in any publications or public documents. Thank you again for your support!

Name of organization: _____

Date: _____

1. Please fill in the year in which the senior managers of the hospital began to hold the position of senior management and the current age.

【Filling instructions】

- ① The senior management personnel of the hospital include: those who hold the position of senior management, including the Secretary of the Party Committee, the Director, the Deputy Secretary, and the Vice Director;
- ② The year when the senior management personnel of the hospital began to hold the position of senior management: the year when the current senior management personnel of the unit began to take the senior management position in all the past work experiences, which is not limited to the original position of the person;
- ③ The current age: the age having been turned as of December 31, 2019.
 - Secretary of the Party committee: the year starting to take the senior management position _____ Age _____
 - Director: the year starting to take the senior management position _____ Age _____
 - Deputy Secretary 1: the year starting to take the senior management position _____ Age _____

- Deputy Secretary 2: the year starting to take the senior management position _____ Age _____
- Vice director 1: the year starting to take the senior management position _____ Age _____
- Vice director 2: the year starting to take the senior management position _____ Age _____

If there are other senior management personnel, please fill in the blank below with the corresponding year and age.

2. Please fill in the composition of the following personnel in the hospital as of December 31, 2019.

【Filling instructions】

- ① Medical personnel include personnel engaged in the medical, medicine, nursing and technology.
- ② Engaged in group health care: mainly engaged in perinatal health care, child health care, women health care and other health care work.
 - _____ medical personnel in the hospital
 - _____ medical personnel with vice-senior title or above
 - _____ medical personnel with a master degree or above
 - _____ medical personnel engaged in group health care

3. Please mark “√” in brackets after the corresponding rating criteria according to the rating level of hospital information construction.

- Classification of application function level of EMR (evaluation of the application function level of EMR by the National Health Commission):

Level 0 () Level 1 () Level 2 () Level 3 () Level 4 ()

Level 5 () Level 6 () Level 7 () Level 8 ()

- Assessment level of the standardization degree of hospital information connectivity (evaluation results of Statistical Information Center of Ministry of Health, Information Standards Professional Committee, National Health Standard Committee):
Level One () Level Two () Level Three () Level Four () Level Five ()
 - Smart service scoring (if you haven't participated in the evaluation, please fill out the self-assessment results):
Level 0 () Level 1 () Level 2 () Level 3 () Level 4 () Level 5 ()
 - The network information system security protection level(network information system security protection level rating of National Information Security Standardization Technical Committee):
Level One () Level Two () Level Three () Level Four () Level Five ()
4. Please fill in the following data related to the hospital's investment and achievements in scientific research and teaching.

【Filling instructions】 The time is from January 1, 2019 to December 31, 2019;

- ① Supporting education and training expenses: the expenses related to the study outside the hospital and further study of the hospital's staff, and experts' service fees in continuing education projects;
 - ② Funding for scientific research projects: the total amount of project funds approved or contracted in the whole year of 2019, including vertical and horizontal scientific research projects, but excluding the research projects and matching funds within the hospital.
 - ③ Supporting scientific research funds: the actual expenditure on scientific research of the hospital in 2019. This can be based on the relevant items such as scientific research expenditure in the financial audit report.
- The number of staff who receive more than half a year's study in other hospitals (including those for further study, internship and training) is _____ people
 - Supporting education training fee is _____ yuan
 - Funding for scientific research projects is _____ yuan
 - Supporting scientific research funds: _____ yuan
 - The total operating expenses of the hospital is _____ yuan

- The number of articles published in core journals of the hospital is: _____, and the number of SCI paper is: _____
 - The number of new medical technology business projects is: _____
5. Please fill in the following data related to the quality of hospital diagnosis and treatment in 2019:
- Total number of inpatients: _____00,000
Number of inpatients of off-site hospitalization _____00,000
 - Discharged patients with minimally invasive operation: _____ (calculation method: the number with minimally invasive operating table of discharged patients / the number of operating table of discharged patients during the same period \times 100%)
 - Discharged patients with Grade 4 operation: _____ (calculation method: number of Grade 4 operating table of discharged patients/number of operating table of discharged patients during the same period \times 100%)
 - Incidence rate of postoperative complications: _____ (calculation method: the number of surgery patients with postoperative complications/the number of post-surgery patients after being discharged from hospital during the same period \times 100%)
 - Nosocomial infection rate: _____ (calculation method: the number of new cases of nosocomial infection/total number of inpatients during the same period \times 100%)
 - Proportion of intensive care beds: _____ (calculation method: the number of available beds in intensive care unit/total available beds \times 100%)
6. Please fill in the following data related to the management of the district of the hospital in 2019:
- Proportion of annual number of live births in that of midwifery institutions at the district: _____ (annual number of live births of institutions/total number of live births of midwifery institutions at the district during the same period \times 100%)
 - MMR at the district: _____/100,000
 - Infant mortality rate at the district: _____‰
 - Rate of maternal system management at the district: _____%
 - Coverage rate of pre-pregnancy eugenic examination in target population: _____%
 - Screening rate of newborn genetic metabolic disease at the district: _____%

7. Please fill in the patient and employee satisfaction in 2019 and tick “√” in the brackets of the corresponding data source.

- Inpatient satisfaction: _____%

Data Source:

Survey of third-party company () Survey of the hospital itself () No data ()

- Outpatient satisfaction: _____%

Data Source:

Survey of third-party company () Survey of the hospital itself () No data ()

- Employee satisfaction: _____%

Data Source:

Survey of third-party company () Survey of the hospital itself () No data ()

8. Please fill in the score of your hospital in the performance appraisal of national third-grade hospital in 2018 _____, ranking _____.

The questionnaire is completed. Thank you for your support!

[This page is deliberately left blank.]

Annex I: Relevant Tables

Table i.1 Source composition of Patients in SD Maternal and Child Healthcare Hospital in 2019

No.	Nationwide	Total	No.	Nationwide	Total
1	Guangdong Province	697492	18	Gansu Province	399
2	Guangxi Province	36472	19	Jiangsu Province	413
3	Hunan Province	16028	20	Hebei Province	345
4			21	Heilongjiang Province	405
	Sichuan Province	15823		Shanxi Province	185
5	Hubei Province	7044	22	Jilin Province	212
6	Jiangxi Province	6699	23	Shaanxi Province	162
7	Henan Province	4108	24	Liaoning Province	180
8	Guizhou Province	3083	25	Inner Mongolia	118
9	Chongqing	2082	26	Chengdu City	110
10	Yunnan Province	1599	27	Shanghai City	105
11	Fujian Province	1286	28	Xinjiang Province	89
12	Anhui Province	1110	29	Macao	52
13	Shaanxi Province	1007	30	Hong Kong	37
14	Shandong Province	749	31	Tianjin City	20
15	Zhejiang Province	753	32	Beijing	24
16	Hainan Province	740	33	Qinghai Province	44
17	Hubei Province	535	34		

Source: HIS system of SD Maternal and Child Healthcare Hospital

Table i.2 Disease Composition of Patients in SD Maternal and Child Healthcare Hospital in 2019

No.	Outpatient pathogeny		Hospitalization pathogeny		Death pathogeny	
	Type of disease	Ratio (%)	Type of disease	Ratio (%)	Type of disease	Ratio (%)
1	Acute bronchitis	11.65	Bronchial pneumonia	10.02	Neonatal hypoxic-ischemic encephalopathy	21.43
2	Pregnancy check and test	11.28	First degree perineal laceration during childbirth	4.51	Pulmonary hemorrhage originated in perinatal period	14.29
3	Acute pharyngitis	10.42	Pregnancy with uterine scar	4.12	Obstetric death	7.14
4	Female infertility	3.99	Diabetes mellitus during pregnancy	3.87	Dilated cardiomyopathy	7.14
5	Upper respiratory tract infection (URTI)	2.79	Neonatal hyperbilirubinemia	3.7	Leiter's syndrome	7.14
6	Vitamin D deficiency	2.76	Congenital pneumonia	3.62	Neonatal septicemia	7.14
7	Acute tonsillitis	2.58	Premature rupture of membranes and	3.46	Neonatal hyperbilirubinemia	7.14

			labor begins within 24 hours		
8	Vaginitis	2.25	Threatened abortion	3.14	Neonatal respiratory distress syndrome
9	Routine health examination for children	2.25	Mycoplasma pneumoniae pneumonia	3.04	Asphyxiation caused by foreign body inhalation
10	Pregnancy check and test	1.94	Excessive foreskin, phimosis and incarcerated phimosis	2.22	Malignant tumor of bronchus or lung

Source: HIS system of SD Maternal and Child Healthcare Hospital

Table i.3 Distribution of Gender and Age of Patients in SD Maternal and Child Healthcare Hospital in 2019

Age	Female	Male	Total
Children (0-4 years old)	163227	217220	380447
Adolescents (5-14 years old)	44392	58831	103223
Young people (15-29 years old)	149,568	10997	160565
Young people (30-44 years old)	173794	15626	189420
Middle age (45-59 years old)	21327	2306	23633
Elder people (over 60 years old)	4241	1031	5272
Total	556549	306011	862560

Source: HIS system of SD Maternal and Child Healthcare Hospital

Table i.4 Questionnaire survey analysis of employees in SD Maternal and Child Healthcare Hospital (N=250)

Items	Categories	n	%
Gender	Male	58	23.5
	Female	189	76.5
Age	~20	1	0.4
	21~30	82	34.0
	31~40	115	47.7
	41~50	34	14.1
	51~	9	3.7
Marital status	Unmarried	54	21.6
	Married	191	76.4
	Divorced	3	1.2
Educational background	Senior high school/technical secondary school and below	4	1.6
	Associate college	47	19.0
	Bachelor	179	72.2

Items	Categories	n	%
	Postgraduate and above	18	7.3
Professional title	Senior	36	18.8
	Intermediate	67	34.9
	Preliminary	89	46.4
Post	Medical staff	110	44.0
	Nursing personnel	85	34.0
	Administrative managers	27	10.8
	Logistic service staff	23	9.2
Evaluation on the status quo of hospital operation and management	Very satisfied	37	14.9
	Satisfied	118	47.6
	Basically satisfied	77	31.0
	Unsatisfied	9	3.6
Evaluation on current work status	Can not tell	7	2.8
	Very satisfied	33	13.2
	Satisfied	107	42.8
	Basically satisfied	92	36.8
Awareness of hospital development goals in the next three years	Unsatisfied	8	3.2
	Can not tell	9	3.6
	Very clear	48	19.2
	Basically clear	126	50.6
Awareness of annual work goals of the hospital	Know about its existence, but not very clear	74	29.7
	No objectives	1	0.4
	Very clear	45	18.0
	Basically clear	137	54.8
Awareness of annual work goals of the department	Know about its existence, but not very clear	67	26.8
	No objectives	1	0.4
	Very clear	86	34.5
	Basically clear	132	53.0
Whether to set clear personal work goals every year	Know about its existence, but not very clear	29	11.6
	No objectives	2	0.8
	Yes	122	49.0
Whether the management system policies and procedures of the hospital are specific	Sometimes	120	48.2
	No	7	2.8
	Very specific	41	16.5
	Relatively specific	125	50.4
	Mostly specific	67	27.0
	Partly specific	15	6.0

Items	Categories	n	%
Function of hospital's performance appraisal	Strong motivation	31	12.6
	Some motivation	152	61.5
	Blurred indicators and hard to motivate	56	22.7
	Complete formalism	8	3.2
Hospital's salary competitiveness	Lack of competitiveness in this region	66	27.5
	Being competitive in this region	119	49.6
	Unfair internal allocation	33	13.8
	Fair internal allocation	22	9.2
Factors that have the greatest impact on work performance (3 options at most)	Higher salary	164	65.6
	More exciting job	34	13.6
	Good interpersonal relationship	68	27.2
	Opportunities to learn	79	31.6
	Opportunities for promotion and development	85	34.0
	Good employee welfare	144	57.6
	Stable job	31	12.4
	Respect of superiors and colleagues	55	22.0
	Good working environment	84	33.6
Have you ever thought of leaving the hospital	Yes	19	7.7
	It remains to be seen	103	41.5
	No	126	50.8
Leaders' implementation of hospital system in the process of management implementation	Strictly implement	110	44.4
	Basically implement	120	48.4
	Seldom implement	3	1.2
	Basically different from people to people	15	6.0
Whether the superior often discuss how to improve work performance	Often	74	30.0
	Sometimes	141	57.0
	Never	32	13.0
Hospital's current advantages	Services	150	60.0
	Technology	115	46.0
	Brand image	100	40.0
	Hospital culture	84	33.6
	Management	72	28.8
	Talents	47	18.8
	Quality	44	17.6
Equipment	17	6.8	

Items	Categories	n	%
Hospital's current disadvantages	Geographic location	12	4.8
	Geographic location	171	68.4
	Equipment	106	42.4
	Talents	82	32.8
	Technology	81	32.4
	Management	36	25.2
	Services	37	14.8
	Quality	32	12.8
	Hospital culture	28	11.2
	Brand image	28	11.2
The most necessary work for the hospital to improve	To improve medical technological level	176	70.4
	To introduce some modern medical equipment	132	52.8
	To bring in excellent professional talents	133	53.2
	To promote management level	70	28.0
	To conduct market publicity and marketing	48	18.4
	To strengthen employee training	50	20.0
Commonly-seen unfavorable phenomena in hospital	To promote medical service level	84	33.6
	Employees lack marketing awareness and fail to meet customers' needs	104	41.6
	Employees lack efficiency concept and tend to procrastinate	73	29.2
	Meetings are of a great number yet they fail to take effect	59	23.6
The future of the hospital	Many employees are reluctant to take responsibilities for decisions	31	12.4
	Better	207	82.8
	Almost the same as now	21	8.4
	Worse	2	0.8
Whether the hospital has values	Can not tell	20	8.0
	No	46	21.7
Whether the hospital has spirit	Yes	166	78.3
	No	45	22.0
	Yes	160	78.0

Table i.5 Investigation and analysis of customer needs of SD Maternal and Child Healthcare Hospital (N=300)

Items	Categories	n	%
Gender	Male	32	10.7
	Female	268	89.3
Place of residence	This city	211	70.3
	Other cities	89	29.7
Age	~20	9	3.0
	21~30	165	55.0
	31~40	112	37.3
	41~50	9	3.0
	51~	5	1.7
Marital status	Unmarried	46	15.3
	Married	251	83.7
	Divorced	3	1.0
Occupations	Administrative managers	28	9.3
	Professional/technical personnel	25	8.3
	Clerks	92	30.7
	Workers/services staff	26	8.7
	Farmers	2	0.7
	Private businessmen	20	6.7
	Jobless	41	13.7
	Students	8	2.7
	Retired	3	1.0
	Others	55	18.3
Literacy	Illiteracy/semi-illiteracy	5	1.7
	Primary school	4	1.3
	Junior high school	47	15.7
	Senior high vocational school	39	13.0
	Technical secondary school	33	11.0
	Associate college	98	32.7
	University and above	74	24.7
The distance from SD	No more than 1km	11	3.7
	1-2kms	52	17.3
	2-3kms	48	16.0
	3-4kms	28	9.3
	4-5kms	41	13.7
	5 kms and above	120	40.0
Once being treated in SD	Yes	247	82.3
	No	53	17.7
Ranking of factors to be	SD's To shorten the treatment waiting time	209	69.7

Items	Categories	n	%
improved (3 items at most)	To increase professional doctors	161	53.7
	To promote treatment surroundings	129	43.0
	To improve medical treatment level	126	42.0
	To offer convenient services	105	35.0
	To add more medical inspection equipment	78	26.0
	To provide clear expenditure list	50	16.7
	To promote service attitude	22	7.3
	Others--to improve car-parking problem	11	3.7
Reasons of choosing SD (3 items at most)	Hospital's good reputation	225	75.0
	Familiar and trustworthy doctors	117	39.0
	Relatives' or friends' recommendations	137	45.7
	Convenient transportation	56	18.7
	Reasonable charges	66	22.0
	Advanced medical equipment	64	21.3
	High medical treatment level	81	27.0
	Medical insurance designated hospital	112	37.3
The most valued factors to choose SD (4 items at most)	Medical treatment level	193	64.3
	Amicable service attitude	192	64.0
	Hospital's good reputation	188	62.7
	Convenience in medical treatment process	155	51.7
	Being time-saving	107	35.7
	Transparency in charges	106	35.3
	Convenience in transportation	73	24.3
	Advanced medical equipment	71	23.7
Expected channels to know SD (2 items at most)	Favorable medical treatment surroundings	63	21.0
	Low prices	39	13.0
	Healthcare lectures	152	50.7
	Voluntary medical treatment	131	43.7
	From relatives and friends	120	40.0
	TV	77	25.7
	Publicity flyers/leaflets	69	23.0
	Newspaper	34	11.3
Internet/official subscriptions	19	6.3	

Items	Categories	n	%
Medical treatment choices apart from SD (4 items at most)	Shunde People's Hospital	278	92.7
	Foshan Women and Children Hospital	181	60.3
	Daliang Hospital	174	58.0
	The First People's Hospital of Foshan	178	59.3
	Shunde Traditional Chinese Medicine (TCM) Hospital	144	48.0
	Other Grade-A Tertiary Hospitals in Guangzhou	116	38.7
	Guizhou Hospital	39	13.0
	New Rongqi Hospital	31	10.3
	Beijiao Hospital	23	7.7
	Longjiang Hospital	15	5.0
To know more about SD (3 items at most)	Introduction to experts	194	64.7
	Introduction to medical treatment projects	194	64.7
	Introduction to disease prevention and healthcare knowledge	170	56.7
	Introduction to departments	120	40.0
	Introduction to medical expenses	110	36.7
	Introduction to inspection equipment and projects	109	36.3
	The most important factors in medical treatment process (5 items at most)	Medical security	240
Being free from diseases		192	64.0
Reasonable medication and inspection		184	61.3
Possessing an informed right to choose the treatment plan		178	59.3
Favorable services		157	52.3
Being respected		152	50.7
Care from doctors and nurses		122	40.7
Handiness		77	25.7
Convenience		68	22.7
Privacy protection		67	22.3
Services to be provided by SD (2 items at most)	Favorable medical treatment environment	61	20.3
	Telephone return visit after being discharged	81	27.0
	Appointment-making services	246	82.0
	Building of personal healthcare profiles	206	68.7

Items	Categories	n	%
	Setting up VIP customer services	66	22.0
Understanding of SD's new hospital	Understand and expect to be put into use as soon as possible	134	44.7
	Understand but worry about increase in medical expenses	38	12.7
	Understand but not hope the hospital to move away	9	3.0
	Do not know	119	39.7
Types of preferred medical staff	Advanced medical skills but moderate medical ethics	124	42.8
	Moderate medical skills but good medical ethics	166	57.2
Choices made in medical treatment	Choosing hospital before doctors	214	71.3
	Doctors first and hospitals do not matter	74	24.7
	Both doctors and hospitals do not matter	10	3.3
SD is the top hospital for you to choose	Top-priority hospital	253	84.3
	Alternative hospital	46	15.3
	Not within consideration	1	0.3
SD is for women and children's special/critical diseases	Top-priority hospital	203	67.7
	Alternative hospital	85	28.3
	Not within consideration	12	4.0
The first expected direction of SD's development	Convenient hospital for people	132	44.0
	Honest hospital	132	44.0
	Fair-pricing hospital	36	12.0
The second expected direction of SD's development	High-tech specialized hospital	162	54.0
	Specialized hospital with high-quality services	138	46.0

Note: "SD" is the abbreviation of SD Maternal and Child Healthcare Hospital

[This page is deliberately left blank.]

Annex J: Relevant Figures

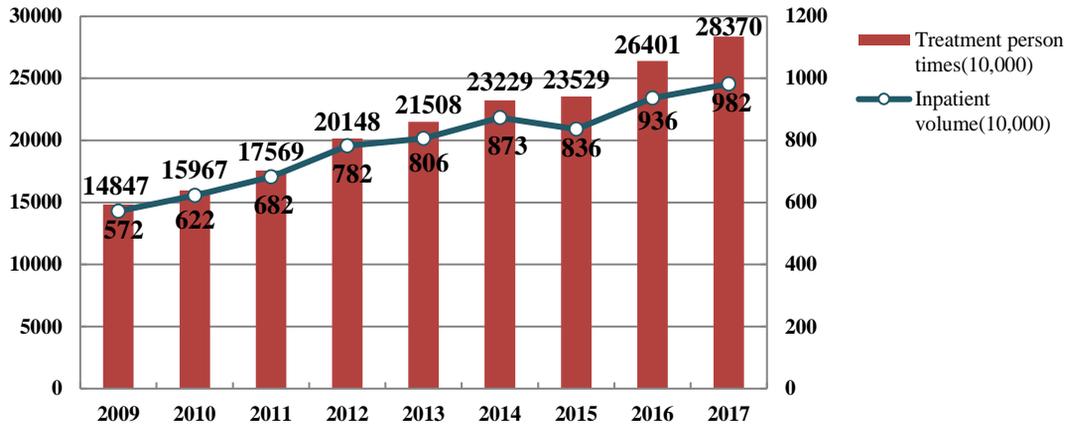


Figure j.1 Treatment person times and inpatient volume (10,000) of maternal and child healthcare hospitals from 2009 to 2017

Source: National Bureau of Statistics (2010-2018)

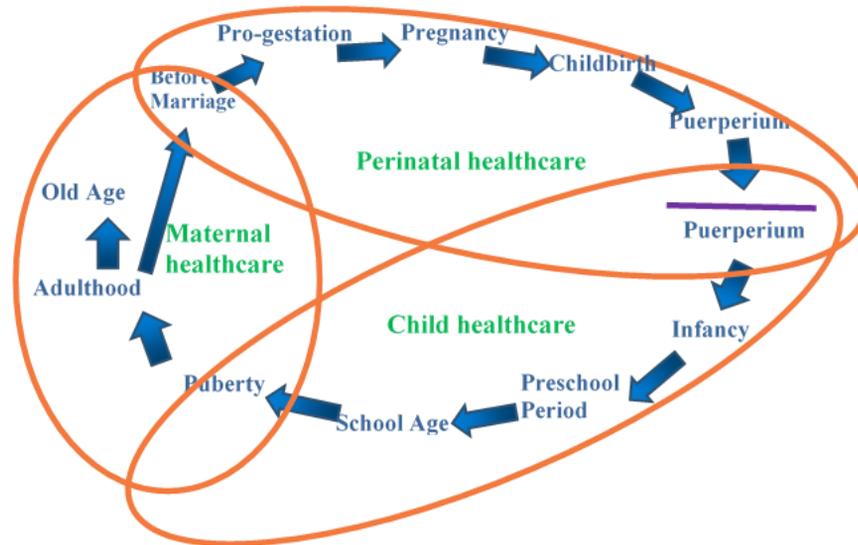


Figure j.2 Full life cycle maternal and child healthcare closed loop

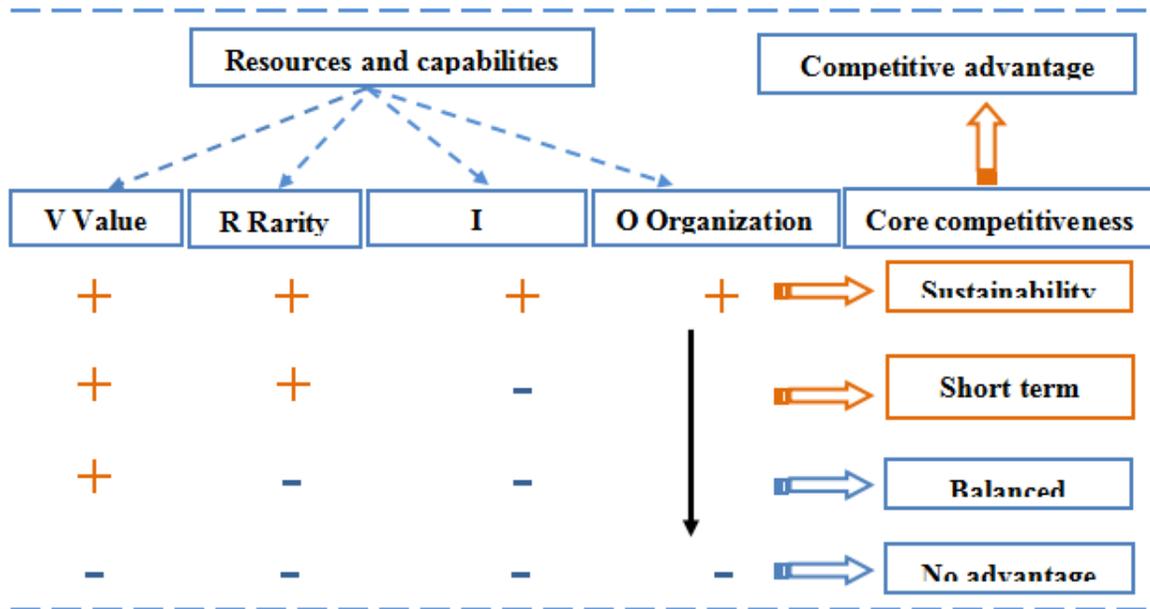


Figure j.1 Analysis framework of core competitiveness

Source: Compiled from (Barney, 1991)

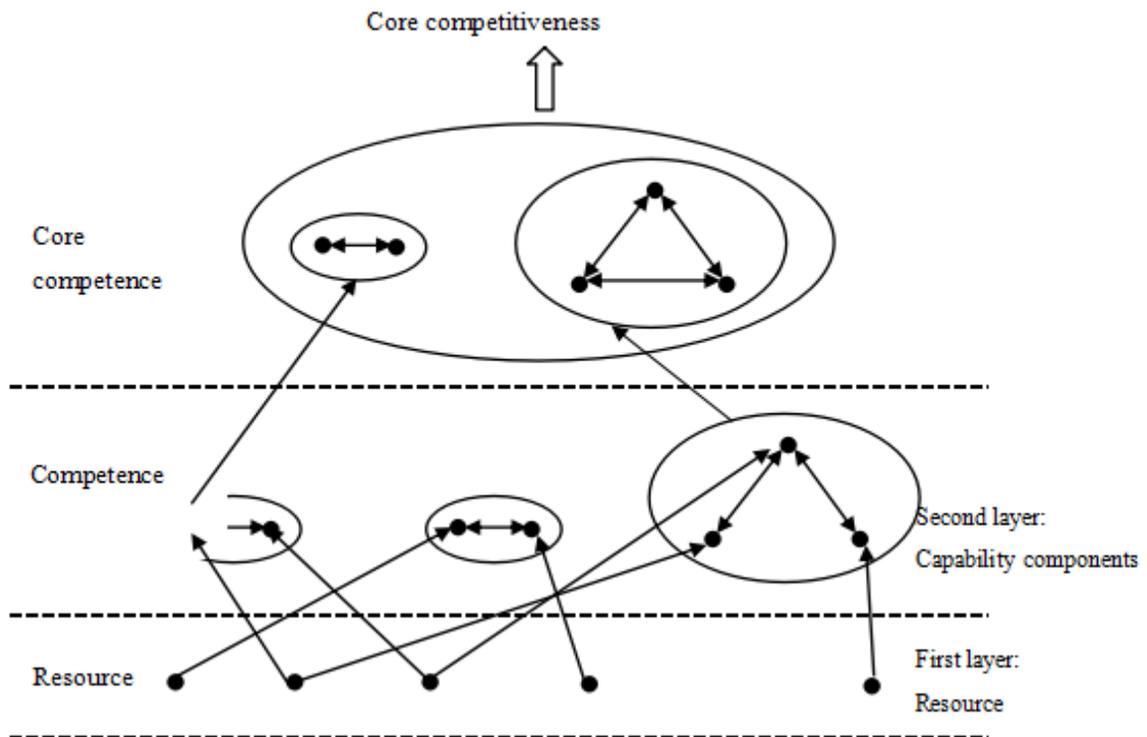


Figure j.2 Layering of core competitiveness components

Source: (Yang, 2007)

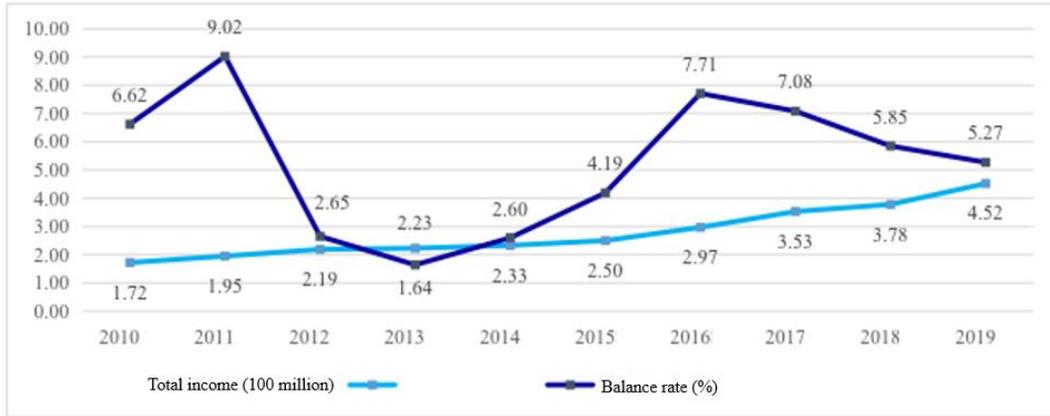


Figure j.5 SD Maternal and Child Healthcare Hospital revenue and balance from 2010 to 2019

Source: financial reports of SD Maternal and Child Healthcare Hospital

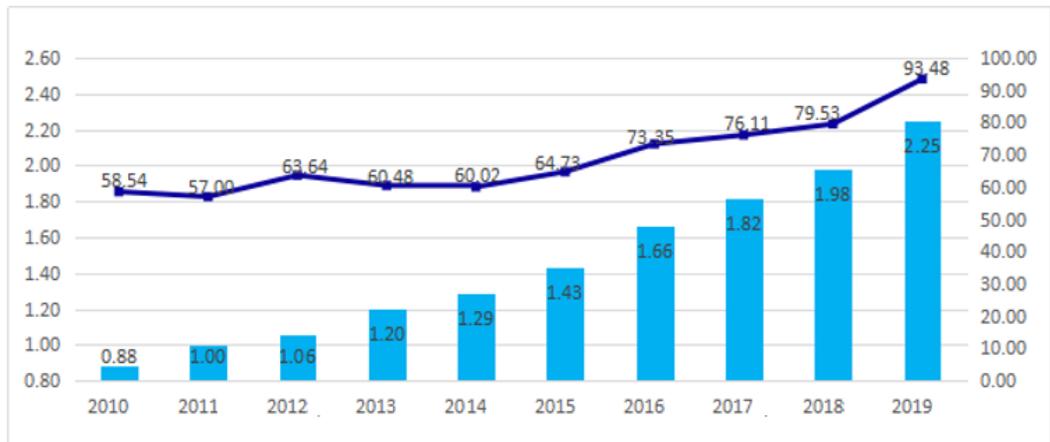


Figure j.6 Number of outpatients and outpatient service revenue in SD Maternal and Child Healthcare Hospital from 2010 to 2019

Source: HIS system of SD Maternal and Child Healthcare Hospital

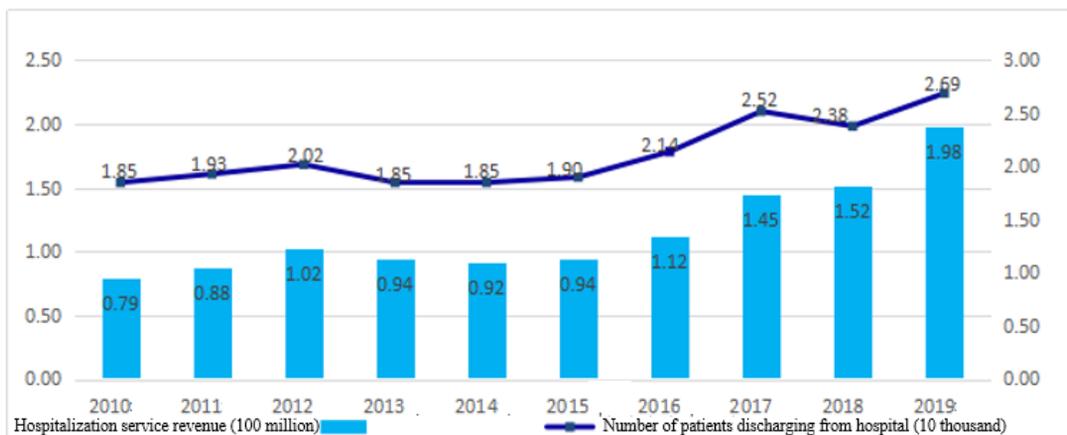


Figure j.7 Number of patients discharging from hospital and hospitalization service revenue in SD Maternal and Child Healthcare Hospital from 2010 to 2019

Source: financial reports of SD Maternal and Child Healthcare Hospital

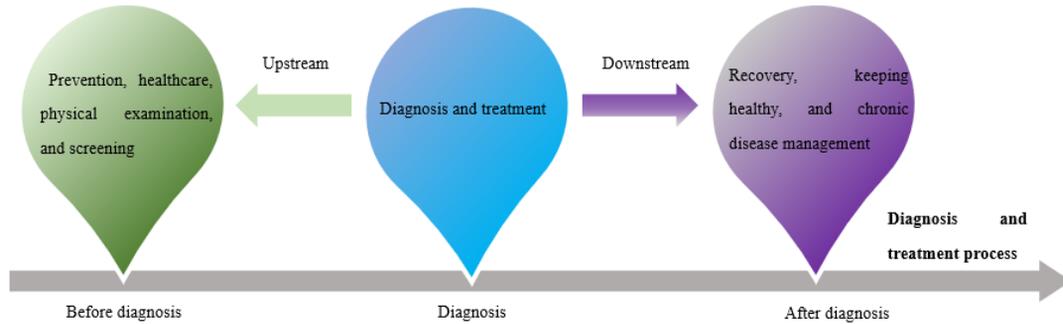


Figure j.8 Flow diagram of the integrated healthcare service system

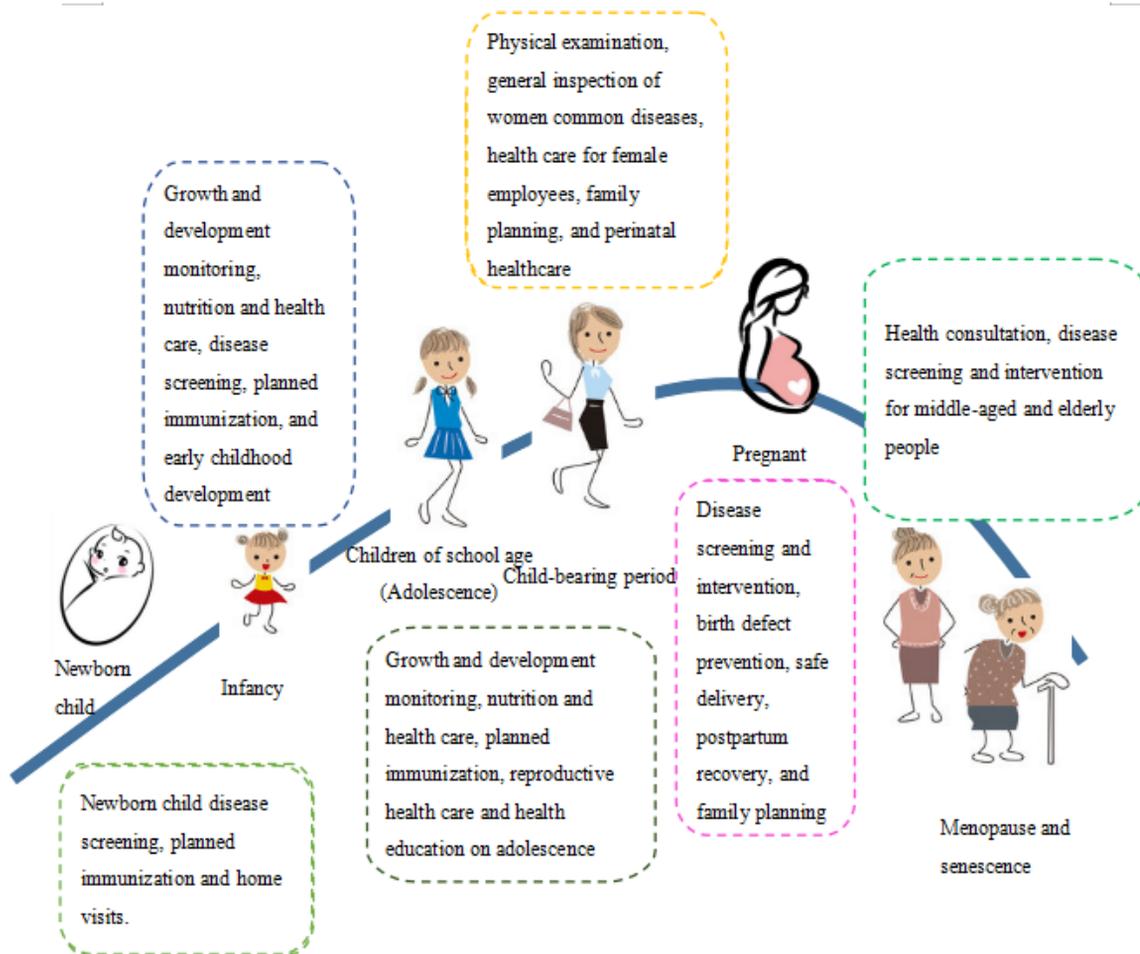


Figure j.9 The diagram of the medical care service chain with seamless connection of maternal and child health throughout the life cycle

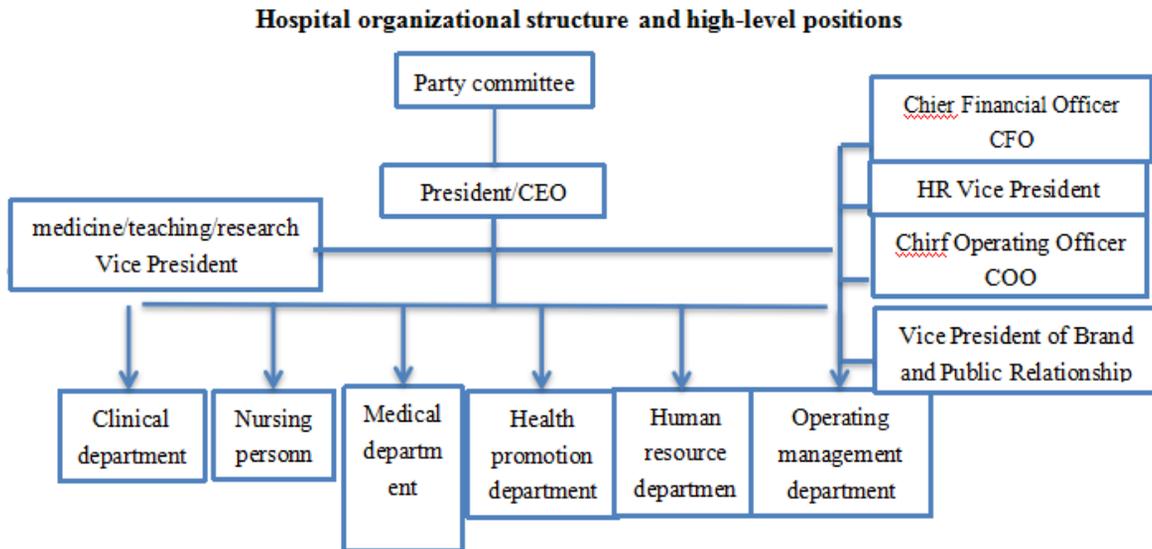


Figure j.9 SD Maternal and Child Healthcare Hospital organizational structure and high-level positions