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Understanding China's “Performance Appraisal System” of Tertiary Public Hospitals and Its Implementation Effects: An Empirical Study Based on Stakeholder Theory and the Balanced Scorecard

YAO Shufang

Doctor of Management

Supervisor:
PhD MA Shaozhuang, Associate Professor with Habilitation,
ISCTE University Institute of Lisbon

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Abstract

In 2019, the General Office of China's State Council issued the "Opinions on Strengthening the Performance Appraisal of Tertiary Public Hospitals" (referred to as the "National Appraisal"). This study aims to analyze to what extent the "National Appraisal" system balances the interests of key stakeholders of public hospitals in China and what changes and challenges its implementation has brought to hospitals.

Guided by stakeholder theory and the balanced scorecard, the key stakeholders of China's public hospitals were identified through two rounds of consultations with experts (the Delphi method) ($N_1 = 46$, $N_2 = 29$), the "National Appraisal" data of three hospitals between 2018 and 2020 were analyzed, and semi-structured interviews (N = 41) were conducted with key stakeholders of the three hospitals.

The results show that: (1) the key stakeholders include patients, hospital managers, clinician, health authorities, and the public, while the "National Appraisal" indicators only cover the first four types; (2) The "National Appraisal" indicators for the four key stakeholders are unbalanced, including insufficient indicators to address the interests of clinicians and absence of indicators to evaluate health authorities. (3) The "National Appraisal" has played a positive role in guiding hospitals to prioritize patients' interests, to clarify the hospitals' positioning, to value the quality of healthcare services, and to develop information technology, amongst others.

This study puts forward suggestions for implementing the "National Appraisal" and optimizing its indicators by constructing a balanced scorecard performance management framework based on the stakeholder theory, and by establishing a feedback and support mechanism for hospitals.

Keywords: Stakeholder theory; balanced scorecard; hospital performance appraisal; public hospitals in China

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Resumo

O gabinete do Conselho de Estado da China emitiu, em 2019, um conjunto de "Pareceres sobre o Fortalecimento da Avaliação de Desempenho dos Hospitais Públicos Terciários" (conhecidos como "Avaliação Nacional"). Este estudo tem como objetivo analisar se o sistema de "Avaliação Nacional" considera de forma equilibrada os interesses dos principais *stakeholders* dos hospitais públicos e que mudanças e desafios a sua implementação trouxe para os hospitais.

Tendo por base a teoria de *stakeholders* e o *balanced scorecard*, identificaram-se os principais *stakeholders* dos hospitais públicos da China através da realização de duas rondas de consultas a especialistas (método Delphi) (N_1=46, N_2=29), analisaram-se os dados da "Avaliação Nacional" de três hospitais entre 2018 e 2020, e realizaram-se entrevistas semiestruturadas (N=41) com os principais *stakeholders* dos três hospitais.

Os resultados mostram que: (1) os principais *stakeholders* dos hospitais públicos incluem pacientes, administradores hospitalares, médicos, autoridades governamentais de saúde e o público em geral, enquanto os indicadores da "Avaliação Nacional" envolvem apenas os primeiros quatro tipos; (2) os indicadores da "Avaliação Nacional" para os quatro tipos de principais *stakeholders* são desequilibrados, havendo um déficit de indicadores para atender aos interesses dos médicos e uma ausência de indicadores para avaliar as autoridades governamentais de saúde; (3) a "Avaliação Nacional" tem desempenhado um papel positivo na orientação dada aos hospitais ao nível da priorização dos interesses dos pacientes, no esclarecimento do posicionamento funcional dos hospitais, na valorização da qualidade dos serviços de saúde, no desenvolvimento de tecnologias de informação, entre outros.

Este estudo apresenta sugestões para a implementação da "Avaliação Nacional" e a otimização dos seus indicadores, construindo uma estrutura de gestão de desempenho do *balanced scorecard* com base na teoria de *stakeholders* e estabelecendo um mecanismo de *feedback* e de apoio para os hospitais.

Palavras-chave: Teoria de stakeholder; balanced scorecard; avaliação de desempenho hospitalar; hospitais públicos na China

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摘 要

2019 年，国务院办公厅发布了《关于加强三级公立医院绩效考核工作的意见》（以下简称“国考”）。本研究旨在探索“国考”在多大程度上平衡了公立医院核心利益相关者的利益，以及其实施给医院带来了哪些积极的变化和挑战。

本研究基于利益相关者理论和平衡计分卡视角，通过两轮专家咨询（Delphi 法）(N_1=46, N_2=29)确定了公立医院的核心利益相关者，分析了三家样本医院 2018-2020 年的国考数据，并针对核心利益相关者开展了半结构访谈(N=41)以获取洞见。

研究发现：（1）公立医院核心利益相关者包括患者、医院管理者、医护人员、政府部门和社会公众，而“国考”指标只涵盖了前四类核心利益相关者；（2)“国考”对四类核心利益相关者的考核指标不平衡，尤其对医护人员的利益关注度较低，且对政府部门的考核力度不够；（3）“国考”实施三年来起到了指挥棒的作用，在引导医院高度重视患者利益，明确医院功能定位，重视医疗服务质量和医院信息化建设等方面都起到了积极作用。

基于上述发现，本研究针对“国考”指标的实施和优化提出了建议，构建了基于利益相关者理论的平衡计分卡绩效管理框架，并建议政府部门基于医院核心利益相关者对“国考”指标进行优化以及建立对医院的反馈和支援机制。

关键词：利益相关者理论；平衡计分卡；国家绩效考核；绩效管理；中国公立医院

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List of Acronyms

CSR: Corporate social responsibility

GAHA: Guangzhou Asclepius Healthcare Accreditation

HDTS: Hierarchical diagnosis and treatment system

JCAHO: Joint Commission on Accreditation of Healthcare Organizations

NHG: National Healthcare Group

NHPC: National Health Performance Committee

PATH: Performance Assessment Tool for Quality Improvement in Hospitals

RCA: Root cause analysis

RDAP: Reactive Defensive Accommodative and Proactive

SEM: Structural equation modeling

WHO: World Health Organization

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Chapter 1: Introduction

This chapter provides an overview of the milestones on performance appraisal of Chinese public hospitals from 2009 to 2019, with a particular focus on the tertiary public hospital performance appraisal system introduced by the Chinese government in 2019. Due to many exposed limitations, the conventional performance appraisal and performance management seriously fall short of the existing healthcare system and the implementation of China's tertiary public hospital performance appraisal system. On this basis, the research problem is defined, research questions put forward, and research purpose described.

1.1 Research background

Recent years have seen the orderly implementation of various healthcare reform policies. In April 2009, China launched a new round of healthcare reform, which urgently requires public hospitals to return from profit-seeking orientation to public interest orientation and live up to their functional positioning so as to effectively solve the problem of "inadequate healthcare services" (Central Committee of the Communist Party of China & China's State Council, 2009).

1.1.1 Classification of public hospitals in China

Public hospitals in China refer to non-profit hospitals that are financed by governments at all levels or state-owned enterprises and public institutions using state-owned assets. They are non-profit-oriented public institutions funded by the government (China's Ministry of Finance & China's Ministry of Health, 2010). The number of public hospitals take up different percentages in the healthcare systems across different countries. The percentage was 85% in the U.K., 65% in France, 46% in Switzerland, 43% in Canada, 42% in Germany, and only 10% in the U.S., which was the lowest (Dai et al., 2009a). In China, public hospitals account for 33.4%.

China's National Health Commission classifies public hospitals into primary, secondary, and tertiary hospitals based on six dimensions: quality of healthcare services, functions, medical technologies, tasks, facilities, and scientific management. Among them, tertiary hospitals refer to those at the regional or higher levels with more than 500 beds and are capable of providing high-level healthcare services while performing teaching and research tasks (China's Ministry

of Health et al., 2012). As of the end of 2020, the number of hospitals in China had reached 35,300, including 11,800 public hospitals, 23,500 private hospitals, 2,996 tertiary hospitals, 2,588 tertiary public hospitals, and 408 tertiary private hospitals, with tertiary public hospitals providing nearly 60% of the healthcare services (National Health Commission of the PRC, 2021). Thus, public hospitals, which account for 33.4% of the total number of hospitals, are the main healthcare service providers and play a crucial role in providing equitable and accessible healthcare services to patients and the public.

1.1.2 Functional positioning of tertiary public hospitals

The Chinese government has clearly defined the functional positioning of public hospitals based on the people's needs for healthcare service. Public hospitals are non-profit public institutions. Their function is to provide people with safe and effective healthcare services. They also need to perform other important functions such as treatment of intractable and critical diseases in the region, development of innovative medical technologies, engagement in basic medical and clinical research, and training of talents (X. L. Sun, 2017). The main functions of public hospitals include healthcare services, healthcare education and scientific research as well as the responsibility to undertake public interest and directive tasks and to respond to public health emergencies on the other hand (Dai et al., 2009b).

Currently, healthcare resources in China are unevenly distributed, with quality resources concentrated in tertiary hospitals in some cities and excellent healthcare professionals continuously siphoned off by provincial tertiary hospitals, resulting in overcrowding in large hospitals and a lack of patients in community hospitals. By the end of 2020, the number of tertiary hospitals in China had accounted for 8.5% of the total number of hospitals, but the number of consultations had accounted for 54% of the total number of consultations. Moreover, this trend has been slowly increasing year by year (National Health Commission of the PRC, 2021). Due to the uneven allocation of quality healthcare resources, people crowd into large hospitals like sardines, confusing the functional positioning of medical institutions (S. Y. Zhang & Wang, 2017).

To clarify the functional positioning of public hospitals at all levels and establish a reasonable order of diagnosis and treatment, in 2015, the Chinese government introduced a hierarchical diagnosis and treatment system (HDTS), initiating the idea that patients should seek treatment and diagnosis at hospitals of different levels according to the severity of their diseases and the difficulty of treatment (General Office of China's State Council, 2015a). In 2016, the Chinese government clarified the main functions of tertiary public hospitals:

providing treatment for severe, acute, intractable, and complex diseases, guiding and training talents for lower-level hospitals, and delivering treatment services in alignment with their own functional positioning (General Office of China's National Health and Family Planning Commission, 2016). However, due to the competition among hospitals at different levels, hospitals are reluctant to share medical technologies and healthcare resources. As a result, patients cannot enjoy integrated, efficient, and collaborative healthcare services (Zhuang et al., 2018). Therefore, the state needs to guide public hospitals at different levels and regions to clarify and implement their functional positioning from a policy perspective.

To provide orderly healthcare services, many countries had started to implement a HDTS long time ago, requiring residents to register with a family doctor and engage a general practitioner to provide primary healthcare services. Patients who need to be referred to a higher level or specialized hospital must be diagnosed and treated by a general practitioner before a referral letter can be issued. In the U.K., free healthcare services are provided to all, but a strict system requiring primary treatment in community hospitals is in place. Patients must have a doctor's referral letter and a resident's consent before they can receive inpatient services, otherwise they cannot enjoy free medical care. Undoubtedly, to achieve hierarchical diagnosis and treatment and two-way referrals, it is necessary to build a sound network of medical referral services characterized by information sharing, interconnectivity, and interoperability (Nancy et al., 2016).

1.1.3 Evolution of policies on the performance appraisal of public hospitals in China

As the new healthcare reform continues to deepen and advance, policies related to the healthcare system reform have been constantly evolving. On April 8, 2017, Beijing implemented a "zero-markup" drug policy to bring order to the price comparisons in healthcare services. Public hospitals in China abolished drug markups to put an end to the practices of hospitals funding their operations with profits from overpriced drugs (Nancy et al., 2016). On June 25, 2018, to make room for standardized price adjustments for healthcare services, the People's Government of Beijing Municipality (2018) abolished the markup on medical consumables in public hospitals, further ending the practices of hospitals funding their operations with profits from overpriced medical consumables. The "zero markup" on drugs and medical consumables has significantly changed the revenue structure of hospitals. Hospitals need to compensate for the reduction in the "reasonable" revenue generated from the markups on drugs and medical consumables by adjusting the prices of healthcare services, relying on fiscal financing, and reducing hospital costs (National Health and Family Planning Commission of the PRC et al.,

2018).

To achieve normal operation, public hospitals need to rely on the government financing to establish a reasonable compensation mechanism on the one hand and to improve the internal organizational performance management, achieve lean management, and cut costs on the other hand. However, the Chinese government's fiscal financing for public hospitals is very limited and seriously falls short of what is needed, and this problem is particularly pronounced in less economically developed regions. Guangzhou Asclepius Healthcare Accreditation (GAHA) Center conducted a questionnaire among 100 public hospitals across China in December 2018. The results showed that nearly 70% of the hospitals believed that government financing for hospitals was not in place after the abolition of drug price markups. Besides, 70.15% of the hospitals believed that the fiscal financing they received was inadequate, and only 5.23% of the hospitals deemed the financing they received adequate (X. L. Wang et al., 2018).

In 2020, China's total healthcare spending reached 7.1 % of its GDP. Although this ratio had been increasing year by year, it was still significantly lower compared to developed countries. Due to insufficient government financing to public hospitals and the reduction of hospital profits due to the abolition of price markups for drugs and medical consumables, public hospitals generally exhibited a profit-seeking tendency to pursue economic interests and sustain normal operations (Ma et al., 2017; Zeng et al., 2022). Some public hospitals link performance appraisals directly to the economic benefits generated by the medical professionals. To meet the appraisal criteria, medical professionals started to recommend non-essential medical products and services to patients, which lead to wasted healthcare resources and continue to drive up medical expenses (National Health Commission of the PRC, 2021). The extensive performance management model of public hospitals that emphasizes revenue and blindly expands in size has caused widespread concern among government officials and the public.

The performance appraisal system of public hospitals needs to strike a balance between maintaining the public interest orientation of public hospitals and mobilizing the initiative of medical professionals, which is related to the effectiveness of the healthcare reform (M. Zhang, 2010). Since 2009, policies related to China's new healthcare reform have been introduced one after another, and performance appraisal has become a key initiative in the reform of public hospitals. The new healthcare reform emphasizes performance appraisal centering on public interest orientation while improving efficiency and service quality (Central Committee of the Communist Party of China & China's State Council, 2009). Since then, to guide public hospitals to return from profit-making to public interest orientation, implement functional positioning, emphasize patient-centeredness, and improve the healthcare quality and operational efficiency

of public hospitals, the Chinese government has introduced policies related to the performance appraisal of public hospitals almost every year. Among them, two policies that have had a profound impact on public hospital performance appraisal are the "Guiding Opinions on the Pilot Comprehensive Reform of Urban Public Hospitals" (General Office of China's State Council, 2015b) and the "Opinions on Strengthening the Performance Appraisal of Tertiary Public Hospitals" (General Office of China's State Council, 2019). Both policies clearly put forward that the public hospital performance appraisal system needs to highlight public interest orientation and evaluate public hospital performance from different dimensions. The policies on the performance appraisal of Chinese hospitals since 2009 are listed in Table 1.1 below.

Table 1.1 Important policies on the performance appraisal of Chinese public hospitals since 2009

Issuer(s) (Year)	Document name	Relevant contents
Central Committee of the Communist Party of China and China's State Council (2009)	Opinions of the Central Committee of the Communist Party of China and the State Council on Deepening the Reform of the Medical and Health System	Measures should be taken to establish a performance appraisal management system centered on public interest, strengthen and improve internal management, focus on service quality, and improve efficiency and service quality.
China's Ministry of Health et al. (2010)	Guiding Opinions on the Pilot Reform of Public Hospitals	Public hospitals should carry out performance appraisal to improve the efficiency of hospital operations and motivate medical professionals.
General Office of China's State Council (2011)	2011 Public Hospital Reform Pilot Work Arrangement	A public hospital performance appraisal system with public interest as the core should be established.
China's Ministry of Health et al. (2012)	Notice on Doing a Good Job in the Reform of Public Hospitals in 2012	The performance appraisal results should be linked to the appointment and removal of hospital presidents, rewards and punishments, financial subsidies granted to hospitals, and the per capita income of the hospital staff to facilitate continuous service improvement and efficiency of hospitals.
General Office of China's State Council (2013)	Notice on the Issuance of the Main Work Arrangements for Deepening the Reform of the Medical and Health System in 2013	The introduction of third-party appraisal should be encouraged, and quantitative appraisal and effect appraisal strengthened.
General Office of China's State Council (2014)	Notice on the Issuance of Key Tasks for Deepening the Reform of the Medical and Health System in 2014	Priority should be given to solve the problems of unreasonable planning and resource allocation of public hospitals, inadequate emphasis on public interest, poor management system, unstandardized order of healthcare, and lack of support from comprehensive reform.
General Office of China's State Council (2015b)	Guiding Opinions on the Pilot Comprehensive Reform of Urban Public Hospitals	Efforts should be made to establish a public interest-oriented appraisal mechanism, highlighting the functional positioning and evaluating hospital performance from six dimensions, namely, hospital operational efficiency, quality of healthcare services, code of medical conduct, level of medical technologies, medical cost control, and public

Issuer(s) (Year)	Document name	Relevant contents
		satisfaction.
National Health and Family Planning Commission of the PRC et al. (2015)	Guiding Opinions on Strengthening the Performance Evaluation of Public Medical and Health Institutions	Performance appraisal indicators reflect the implementation of public interest orientation in public hospitals, with social benefits, delivery of services, comprehensive management, and sustainable development as the first-level indicators.
General Office of China's State Council (2016)	Notice on the Key Tasks for Deepening the Reform of the Medical and Health System in 2016	Measures should be taken to establish and improve a comprehensive performance appraisal indicator system for public hospitals and introduce third parties to conduct performance appraisal. Efforts should be made to increase the professionalism and expertise of hospital presidents and strengthen financial budget management.
General Office of China's State Council (2017)	Guiding Opinions on the Establishment of Modern Hospital Management System	The president is the first person responsible for a hospital's practice and healthcare quality and safety according to the law, and the hospital's performance appraisal indicators should be implemented in each department and among medical professionals.
National Health and Family Planning Commission of the PRC et al. (2018)	Notice on Consolidating the Achievements of Relieving and Replenishing Medicine and Continuously Deepening the Comprehensive Reform of Public Hospitals	Measures should be taken to cancel markups for all drugs; to gradually establish a new mechanism to maintain public interest orientation, mobilize initiative, and guarantee sustainable operation; and to consolidate and improve the new financing mechanism for public hospitals.
General Office of China's State Council (2019)	Opinions on Strengthening the Performance Appraisal of Tertiary Public Hospitals	The performance appraisal should be strengthened as a guide to prompt hospitals to return to the public interest orientation and to improve the capacity of healthcare services and operational efficiency.

1.1.4 Problems with conventional performance appraisals

Peter Drucker regarded hospitals as the most complex form of modern knowledge-based organizations, with teams of different professionals making their best efforts and each doing their part for a common goal (Drucker, 1993). Managers of Chinese public hospitals have only begun to pay attention to performance appraisal in recent years and are still in a period of exploration of performance management theories and practices. Based on an analysis of the status of hospital performance appraisal and management, conventional performance appraisals have the following problems.

First, the impact of different stakeholders' needs for hospital performance appraisal is not given due credit, and the needs of various stakeholders are not balanced. Healthcare reform involves redistribution and balancing of resources and interests, and the ability to deal with stakeholder issues is the key to the success of healthcare reform and development (K. Hu et al.,

2007). The conventional performance appraisal system of public hospitals focuses too much on the government's guiding role while neglecting the interests of employees, failing to provide quality services to patients, resulting in a serious waste of resources, low operational efficiency, lack of continuous learning motivation and creativity of employees, and slow progress in the development of medical technologies (Qian et al., 2012). Non-profit public hospitals need to keep their public interest orientation, undertake more social responsibilities, and meet the needs of different stakeholders.

Second, the importance of public interest orientation is downplayed and replaced by a heavy focus on financial indicators and an inadequate focus on non-financial indicators, exhibiting a heavy profit-seeking tendency. As non-profit organizations, public hospitals should not pursue profit maximization. Instead, they need to strike a balance between financial and non-financial indicators as well as between social and economic benefits. For a long time, the Chinese government has underinvested in public hospitals. Most public hospitals focus too much on financial indicators in performance management and closely link the income of medical professionals with the economic benefits of hospitals, leading to excessive medical treatment and even compensation for the efforts of clinicians through drug price markups and examination commissions. Consequently, patients need to take up a heavier burden due to the high cost of healthcare services. This leads to lower patient satisfaction and goes against the public welfare of public hospitals (T. Wang, 2018). When conducting performance appraisals, public hospitals should not only consider financial income but also focus more on the public interest orientation and hospital functional positioning and pay attention to non-financial indicators such as improvement of healthcare quality and medical technologies, satisfaction of doctors, nurses and patients, and internal process improvement.

Third, there is a heavy emphasis on performance appraisal results and insufficient attention to the performance management process. Performance management is composed of four closed-loop processes, namely performance planning, performance implementation, performance appraisal, and performance feedback, characterized by a certain degree of overlapping and continuity (F. Luo & Lu, 2016). Performance appraisal and performance management influence each other. Many public hospitals confuse performance appraisal with performance management and believe that performance management is completed once performance appraisal is passed. Guided by this misconception, they do not attach enough importance to performance management effects (R. Wang, 2017). Hospital performance appraisal is a double-edged sword. Efforts need to be made to truly improve management by adopting advanced scientific performance management models and methods to increase efficiency and lower costs

for the purpose of solving problems in hospital development. Inappropriate use of performance appraisal will lead to a series of problems, causing hospitals to lose the momentum of sustainable development and seriously affect the healthcare reform process (Liao, 2019).

Fourth, the key indicators of performance appraisal are not in alignment with hospitals' strategic development goals. Most public hospitals neglect the relevance of organizational development strategy and performance appraisal, rendering performance appraisal a mere formality and failing to algin performance management with hospitals' strategic goals. In the performance appraisal implementation process, public hospitals simply do not consider the intrinsic connection between strategic goals and performance appraisal, lack key indicators of performance appraisal in alignment with hospitals' strategic goals, and fail to align performance goals with hospitals' strategic goals (Tang, 2019). Z. X. Zhang et al. (2018) also suggest that the performance management direction of most public hospitals in China deviates from the development strategy, that the performance indicators are set unreasonably, and that hospitals' strategic goals are not reflected in performance appraisal indicators.

The Conventional performance appraisal system and management model have been proven inefficient, have exposed many drawbacks, and seriously fall short of the existing healthcare system reform and the requirements of the "National Appraisal" for hospital development (see Figure 1.1).

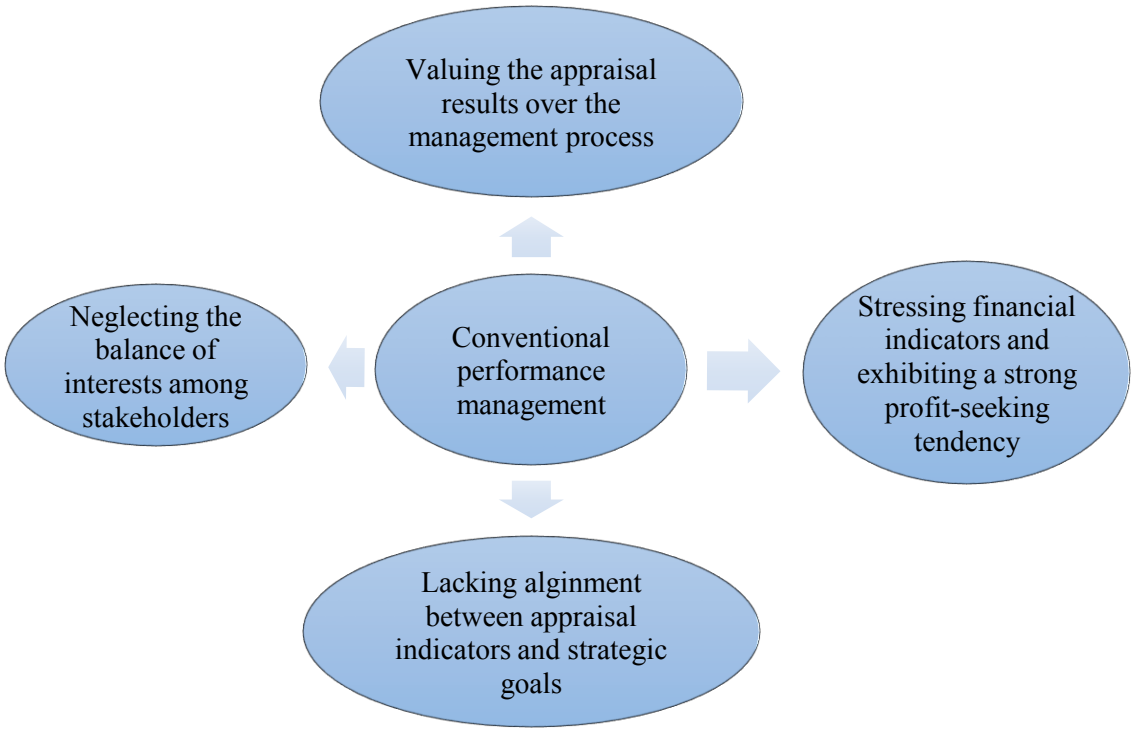


Figure 1.1 Dilemmas of the conventional performance appraisal system

1.1.5 Implementation of the "National Appraisal" and Research problem

In 2019, the Chinese government established a unified performance appraisal indicator system for tertiary public hospitals, alternatively known as the "National Appraisal" (guó kǎo 国考 in Chinese) indicator system (hereinafter referred to as the "National Appraisal"), to measure the performance of tertiary public hospitals in China with the unified set of criteria, give full play to the "baton" role of performance appraisal, and use the performance appraisal results as important references for the selection and appointment of public hospital presidents and members of the leadership team as well as for financial investment and appropriation of funds (General Office of China's State Council, 2019). The "National Appraisal" pushes public hospitals to exercise lean management, control costs, reduce the waste of healthcare resources, and improve the quality and efficiency of healthcare services (M. F. Zhu & Liu, 2019).

To implement the "National Appraisal" and improve hospital performance appraisal results, managers of public hospitals need to resolve the problems of conventional performance appraisals, balance the key stakeholders of hospitals, reduce the profit-seeking tendency, and achieve a balance between financial and non-financial indicators.

The following questions remain to be answered: (1) To what extent does the 2019 "National Appraisal" cover and balance the interests and needs of key stakeholders in public hospitals? (2) What progress has been made in the performance management of public hospitals over the past three years since the implementation of the "National Appraisal"? To what extent has it been improved? (3) How can a unified performance appraisal system be implemented in different hospitals given that there are more than 2,500 tertiary public hospitals in China? (4) What challenges do different hospitals face in the implementation of the "National Appraisal"? At a time when managers of tertiary public hospitals nationwide attach great importance to the "National Appraisal" and it is implemented in hospitals, it is very important to find out answers to these questions as early as possible and explore the correct implementation path so that managers of tertiary public hospitals will avoid detours in the process of implementing the "National Appraisal".

Since the introduction and implementation of the "National Appraisal", little is known about its implementation effect and whether this new appraisal system addresses well the problems of the conventional performance appraisal.

1.2 Research purposes

Performance appraisal in public hospitals is a complex and systematic project, which is related to the adjustment of strategic development direction, functional positioning and social responsibility of hospitals, and involves all key stakeholders of hospitals. The research purposes are as follows:

(1) This study aims to clearly identify the key stakeholders of public hospitals by the Delphi method based on a review and comparison of the existing literature on hospital performance appraisal indicator systems. By analyzing the "National Appraisal" from the perspective of key stakeholders and the balanced scorecard, this study is expected to provide theoretical support and guidance for its effective implementation.

(2) Using prefecture-level city hospitals as the target samples, this study endeavors to understand the implementation outcomes of the "National Appraisal" based on the benefits, positive changes, and challenges it has brought to the sample hospitals and to empirically explore its implementation effects in tertiary public hospitals to provide policy suggestions for its continuous optimization.

(3) Based on the research findings, this study strives to construct a balanced scorecard performance management framework based on stakeholder theory to guide public hospitals to implement the "National Appraisal" oriented towards a balance among stakeholders so as to provide performance managers of public hospitals with supporting management theories and decision-making references, facilitate the transformation from performance appraisal to performance management in public hospitals, and explore performance management paths suitable for the development of public hospitals.

1.3 Research questions

The Chinese government requires provinces and municipalities to strengthen the application of performance appraisal results of tertiary public hospitals and to directly use performance appraisal results as important references for development planning, financial investment, establishment of major projects, adjustment of medical insurance policies, appointment and removal of leaders, as well as implementation of rewards and punishments in public hospitals (General Office of China's State Council, 2019). Apparently, performance appraisals results will be linked to the fiscal support received by tertiary public hospitals and improving the performance appraisal results will be a key and difficult task for managers of public hospitals.

Most public hospitals in China are in the stage of transition from conventional performance management to lean management as well as from experience-based management to scientific management. To improve performance management within public hospitals, it is necessary to accurately analyze the status of existing performance appraisals and identify the existing problems and key influencing factors (S. L. Zhang, 2017). Efforts should be made to explore how public hospitals can upgrade healthcare quality, improve operational efficiency, and rationalize the allocation of resources with the help of the new appraisal system and what challenges they will encounter in the implementation of the appraisal system. To achieve the research purposes, this study puts forward the following research questions (RQs):

RQ1: Who are the key stakeholders of tertiary public hospitals? To what extent are the "National Appraisal" indicators related to these key stakeholders? Are the demands of the key stakeholders balanced and taken into due account?

RQ2: How should the key indicators of the "National Appraisal" be categorized into the four dimensions of the balanced scorecard?

RQ3: What benefits and positive changes has the implementation of the "National Appraisal" brought to the key stakeholders?

RQ4: What are the challenges faced by tertiary public hospitals at the prefecture level in the implementation of the "National Appraisal"? What key appraisal indicators need to be added and improved?

RQ5: What is the status of implementation of the "National Appraisal" in tertiary public hospitals?

RQ5.1: How should the "National Appraisal" indicators be aligned with hospitals' organizational strategy and be implemented?

RQ5.2: What are the main drivers of successful implementation of the "National Appraisal"?

1.4 Contributions

There are very limited studies on performance appraisals of Chinese public hospital based on stakeholder theory in the existing literature. Empirical studies on the influence of key stakeholders on performance appraisals have been almost non-existent in the past three years since the implementation of China's "National Appraisal". This study focuses on the key stakeholders of public hospitals for the first time, analyzes the key indicators of the "National Appraisal" from the perspective of the balanced scorecard, and adopts a mixed research design

combining qualitative and quantitative research methods. It explores the positive changes the concomitant challenges brought by the implementation of the "National Appraisal", the benefits and positive changes brought to the key stakeholders of tertiary public hospitals, and the main drivers of successful implementation of the "National Appraisal" through an empirical analysis of the three sample hospitals.

On this basis, conclusions on the scientific implementation of the "National Appraisal" are drawn. In addition, as one of the very limited empirical studies on the performance appraisal of public hospitals, this study significantly enriches the academic research in this regard.

1.5 Thesis structure

This thesis consists of the following chapters:

Chapter 1: Introduction. The research background is introduced, research problem identified, research purposes pointed out, research questions put forward, innovations highlighted, and thesis structure outlined.

Chapter 2: Literature Review and Theoretical Framework. The concepts of performance, performance appraisal, and performance management are defined; the definitions and classification of stakeholders in public hospitals described; the relationship between stakeholder theory and hospital performance elaborated on; and the application of the balanced scorecard in healthcare discussed.

Chapter 3: Research Methods. The research pathway and data analysis methods are described. The key stakeholders of public hospitals are identified using the Delphi method. Quantitative analysis is performed on the three-year "National Appraisal" data of the sample hospitals. Qualitative data obtained from semi-structured interviews are analyzed using MAXQDA software.

Chapter 4: Research Results. The results are mainly obtained from the analysis of the three-year "National Appraisal" data of the three sample hospitals and semi-structured interviews with key stakeholders of the sample hospitals to answer the research questions.

Chapter 5: Discussion and Conclusions. The findings are discussed in depth to further answer the research questions, and conclusions are drawn. Relevant suggestions are put forward for policymakers and practical implications for hospital managers described. Limitations are identified, and suggestions for further research lighted upon.

Chapter 2: Literature Review

This chapter defines the concepts related to performance, performance appraisal, performance management, stakeholder theory, and the balanced scorecard through literature review. Based on the evolution of stakeholder theory and classification of stakeholders, the relationship between stakeholders and hospital performance is highlighted, and the characteristics of the balanced scorecard and its application in healthcare analyzed. From the perspectives of stakeholder theory and the balanced scorecard, the "National Appraisal" is analyzed in depth.

2.1 Key concepts

2.1.1 Performance

Due to the diversity among organizations, there has been no consensus on the meaning of performance. Scholars' views on the definition of performance fall into three categories: the first view regards performance as an outcome; the second view deems performance a behavior; and the third view considers performance to be composed of both behavior and outcome (Cao, 2009). Bernadin and Beatty (1984) consider performance the result of time-specific work behavior reflected in an organization's strategic goals, customer satisfaction, as well as inputs and outputs. Jensen and Murphy (1990) regard performance as an action or behavior related to organizational goals, which refers to the goal-related behavior itself that can be observed in specific jobs, organizations, and teams. Campbell et al. (1993) state that performance is synonymous with behavior and is the specific behavior itself performed to achieve organizational goals rather than the result of the behavior. Brumbach (1988) argues that performance includes manifestations in two dimensions, behavior and outcome, of which behavior refers to the performance dedicated to accomplishing certain job goals. The above scholars represent the three different views on performance.

Spangenberg (1992) divided performance into three levels, namely, organizational, process/functional, and team/individual. Bates and Holton III (1995) argue that "[P]erformance is a multi-dimensional construct, the measurement of which varies depending on a variety of factors" (p. 279). Chinese scholars generally agree that performance includes both results and processes. For example, in their book entitled Performance Management, Fang and Ran (2016)

define performance as "the work behavior and corresponding results manifested at different levels of an organization expected by the organization to achieve its desired goals, emphasizing the process and results of work activities" (pp. 2-3). Performance is divided into organizational performance, group performance, and individual performance according to different levels of the undertakers. In the context of this study, performance is the effective combination of work behavior and results within a certain period for the purpose of accomplishing organizational goals, and it is important to consider both input (i.e. behavior) and output (i.e. results), which are ultimately expressed as achievements and efficiency.

2.1.2 Performance appraisal

Neely (1999) defines performance appraisal as the process of making corresponding decisions and taking corresponding actions by quantifying the efficiency of past behaviors as well as collecting, organizing, classifying, and analyzing the quantified data. J. K. Yang and Zheng (2007) regard performance appraisal as the comprehensive evaluation of an organization's performance and effectiveness over a time span by developing a scientific and reasonable indicator system as the appraisal standards, following certain appraisal methods and procedures, and based on a multi-dimensional comparison and analysis. Spangenberg (1992) believes that performance appraisal is manifested as a relatively independent management system, and that simple performance appraisal is essential for improving employee satisfaction and realizing organizational goals. The role of performance management should be brought into full play through integration with the organization's vision, mission, culture, and other contextual factors. In today's world, regardless of the type and size of any organization, managers all consider performance appraisal a key priority (Nasiripour et al., 2012). Performance appraisal helps organizations to plan their future strategies and set performance goals for employees to achieve the ultimate goals of the entire organization (H. Y. Wu et al., 2011).

The existing literature shows that different terms may be used to refer to "performance appraisal", mainly including "performance evaluation" (Bahadori et al., 2016; Rahimi et al., 2014; Weng et al., 2009; Yawe, 2010), "performance assessment" (Goshtasebi et al., 2009; Groene et al., 2008; Nwagbara et al., 2016; O'Brien et al., 2008), and "performance measurement" (Grosskopf & Valdmanis, 1987; Mehrtak et al., 2014; Shaw, 2003). These four terms essentially mean the same thing and are often used interchangeably though they could have different meanings from a training perspective (Craven, 2015). For clarity and consistency purposes, "performance appraisal" will be used throughout this study unless the context necessitates the use of alternatives.

2.1.3 Performance management

Daniels and Daniels (1989) first introduced the concept of performance management. Since then, scholars have been exploring and studying this concept, contributing to the further improvement and development of the theory and its methods.

Existing literature shows that different researchers have different perspectives on performance management. The first view is that performance management should be employee-centered and emphasizes employees' personal development and self-actualization. Daniels and Daniels (1989) advocate "putting people first" and argue that continuous improvement of employees' behavior can enhance organizational performance and lead to achievement of the organization's strategic goals. Pamenter (2000) believes that performance management needs to follow Maslow's hierarchy of needs theory, focus on employee development and safety, respect employees' needs, and allow employees to achieve self-actualization in their work. The second view is that the ultimate purpose of performance management is to pursue and achieve the organization's strategic goals, and the core lies in the alignment between employee performance appraisal and the organization's strategic goals. For example, Addams and Embley (1988) argue that performance management is a system links the organization's strategic plan with employee performance appraisal. Similarly, Costello (1994) proposes that performance management is about connecting the specific work of managers and employees to the purpose of an organization in order to achieve its strategic goals. The above two views differ simply due to researchers' different focuses.

Scholars generally agree that performance management is a cyclical management process. Performance management can be considered a management process featured by a cycle of planning, evaluation, and revision (Ainsworth & Smith, 1993). It can also be seen as an organizational performance management system composed of plans, budgets, objectives, indicators, and performance standards, and this system can review the performance of all services regularly and systematically (Rogers, 1990). Bredrup (1995) expressed a similar view that performance management consists of three main processes: planning, improvement, and appraisal. Specifically, performance planning encompasses the organization's strategic goals; performance improvement entails continuous improvement, standardization, and total quality management; and performance appraisal includes performance measures and evaluation. Performance management requires identification and planning of organizational performance goals, which mark both the beginning and end of the performance management cycle (McDavid et al., 2018). Khourshed (2012) constructs a performance management framework and suggests

that performance management is a cycle of performance planning, measurement, and improvement. Scholars are largely consistent in their definition and conceptualization of performance management.

2.1.4 Differences between performance appraisal and performance management

Performance management and performance appraisal are both closely related and different and should not be confused with each other. Performance appraisal mainly refers to the assessment of behaviors and results that have occurred, while performance management is a cyclic management process carried out through four steps: planning, implementation, evaluation, and feedback, on the premise that employees' work behaviors and results are consistent with organizational goals. Performance management not only summarizes past behaviors and results but also values the future results and capabilities of employees and the organization. Performance appraisal is only a key part of performance management, focusing on assessing behaviors and results that have occurred in the past (Fang & Ran, 2016). Performance appraisal needs to set goals and course measures that managers and employees agree on, while performance management needs to help employees reach their goals. Performance appraisal can provide main decision-making basis for performance management, while performance management needs to be forward-looking (Brannick & Prince, 1997). An organization that only carries out performance appraisals for employees without providing continuous feedback and coaching for improvement has not developed a performance management system (Herman, 2005). Therefore, performance appraisal cannot replace performance management, and an organization that focuses only on performance appraisal but neglects performance management will struggle to achieve its performance goals.

2.1.5 Hospital performance, hospital performance appraisal, and hospital performance management

As non-profit organizations, public hospitals need to take public interest as the core, live up to its functional positioning, provide patients with quality and efficient healthcare services, and undertake their due social responsibilities in addition to having the characteristics of general organizations in terms of human and financial management. In this sense, hospital performance differs from enterprise performance in that it needs to ensure economic benefits while delivering social benefits. Hospital performance is influenced by both stakeholders and appraisers. As a result, it consists of multiple levels, multiple dimensions, and diversified characteristics (M. N.

Wu, 2016). The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) defines hospital performance as the ability of an individual, group or organization to perform a process or achieve a desired goal or outcome. It refers to the process, outcome, and service capacity of a hospital to achieve the desired goal over a certain period of time (Z. J. Zhang, 2008). Due to population aging, the increasing need for better therapies, and the shortage of clinicians, governments need to improve the quality and efficiency of hospitals with measurable and repeatable appraisal methods (Meliones et al., 2001).

The World Health Organization (WHO) (2000) considers hospital performance appraisal as an effective tool for managers to assess and improve the behavior and outcomes of healthcare services. The purpose of performance appraisal is to improve the organizational behavior of employees, mobilize employees' initiative and potential, and achieve the management goals of the hospital (Y. Chen, 2010). Performance appraisal is carried out at three levels: hospital, departmental, and individual (Tian et al., 2010). Performance management in public hospitals is a cycle of management activities based on the strategic development goals of the hospital through four stages: performance planning, implementation, evaluation, as well as feedback and improvement (Tao, 2014).

Hospitals in some developed countries have successfully drawn from enterprise performance management to develop a scientific and reasonable performance appraisal system to evaluate hospital performance in multiple dimensions, which has achieved significant results in improving healthcare quality and reducing hospital costs (Dimitropoulos, 2017). In 1995, JCAHO evaluated the performance of U.S. healthcare organizations on 28 performance indicators in five dimensions: patient care, services provided by medical professionals, hospital physical environment, patient safety, and response to departmental needs, and patients could make their choice to seek care based on the published measurements results (Loeb & O'Leary, 1995). The U.K. is a typical country with a National Health Service (NHS) system, which provides free healthcare services according to the different needs of residents. This kind of transitional care has led to inefficiencies in healthcare services and long waiting time for patients. In response, the U.K. government, while focusing on the quality of care, wants to provide fair, effective, and accessible care through performance appraisal, with particular emphasis on indicators related to the average waiting time for outpatient visits, the number of inpatient appointments and the efficiency of care (McKee & Sheldon, 1998).

The National Health Performance Committee (2001, August 1) of Australia introduced a national health performance framework developed by the Department of Health and Aged Care relying on the national public hospital information platform established by the Australian

government. The appraisal indicators include clinical, support, and governance dimensions to facilitate access to data on performance indicators and comparison of performance data across hospitals.

The WHO Regional Office for Europe (WHO/Europe) designed the Performance Assessment Tool for Quality Improvement in Hospitals (PATH), a six-dimensional hospital performance assessment system encompassing four domains: clinical effectiveness, staff orientation, efficiency, and responsive governance, as well as two transversal dimensions: patient-centeredness and safety. The two transversal dimensions run through the four domains, allowing hospitals to select their own indicators during implementation (Veillard et al., 2005).

The Singapore government selectively subsidizes healthcare services to protect citizens' health from multiple sources of financing, and healthcare providers are evaluated by the National Healthcare Group (NHG) and the Singapore Health Services (SingHealth) on four dimensions: better quality of service, less healthcare expenditure, more efficient operation, and safer healthcare, with hospital performance appraisal focused on the patient benefit indicators (Cai, 2015).

Performance appraisal of public hospitals in China got off to a late start. The Chinese government has been exploring a performance appraisal system suitable for public hospitals in China to highlight their public interest orientation, correctly guide their medical practices, improve healthcare quality, and promote lean management.

Government authorities have been implementing policies related to performance appraisal every year as reflected in Table 1.1. The "National Appraisal" assesses the performance of tertiary public hospitals across a total of 55 indicators in four dimensions: healthcare quality, operational efficiency, sustainable development, and satisfaction. The implementation of the "National Appraisal" in tertiary public hospitals is a pioneering work.

2.2 Stakeholder theory

2.2.1 Stakeholder theory

The stakeholder theory can be traced back to 1932 when Dodd (1932) challenged the principal-agent theory arguing that the board of directors of a company must be a true fiduciary, representing not only the interests of the shareholders but also other agents such as employees, consumers, and especially the society as a whole. In 1963, the former Stanford Research Institute was the first to explicitly put forward the stakeholder theory and defined a stakeholder

as a member of "groups without whose support the organization would cease to exist" (Freeman, 1984, p. 52). This definition emphasizes the supporting role of stakeholders to organization but neglects the mutual influence between stakeholders and the organization. In this sense, it is a "unilateral" approach to definition. Later, Rhenman (1968) gave a "bilateral" definition to stakeholder, arguing that stakeholders and enterprises mutually influence each other. On the one hand, an enterprise cannot survive without stakeholders; on the other hand, stakeholders need to rely on the enterprise to achieve their personal goals. The American economist Ansoff (1965) was the first to introduce the concept of "stakeholder analysis" to management. His book *Corporate Strategy* emphasizes the importance of key stakeholders in achieving an organization's goals, and the need to analyze the needs of stakeholders and possible conflicts to adopt appropriate countermeasures.

2.2.2 Stakeholder and stakeholder theory

To date, researchers have not reached a consensus on a clear definition of stakeholders. Stakeholder has been considered a controversial, ambiguous or confusing concept (Choi & Majumdar, 2014). Mitchell et al. (1997) summarized a total of 27 definitions of stakeholders given by representative scholars from 1963 to the mid-1990s and elaborated on them according to the chronological order of the publications.

Based on an analysis of existing literature, stakeholders can be defined either in a broad sense or in a narrow sense. Definitions given in the broad sense are represented by Freeman (1984), who believes that a stakeholder is "any group or individual who can affect or is affected by the achievement of the organization's objectives" (p. 46). This definition emphasizes the importance of stakeholders to the long-term development of the organization. In fact, the stakeholders who can affect or are affected by the enterprise include many individuals and groups such as shareholders, creditors, employees, customers, suppliers, government authorities, related social organizations, and social groups. Freeman's definition of stakeholders is too broad and cannot be accurately distinguished from non-stakeholders. As a result, it can hardly be generalized and applied in enterprises.

The narrow definition is represented by Clarkson (1994), who argues that stakeholders are those who "bear some form of risk as a result of having invested some form of capital, human or financial, something of value, in a firm" (p. 5). This definition particularly emphasizes the relationship between stakeholders and the enterprise with dedicated inputs, which obviously narrows the scope of stakeholders. Other scholars such as Donaldson and Preston (1995) also emphasized the legitimacy of stakeholders in the process of the enterprise's activities and the

need to assume certain risks for the enterprise.

2.2.3 Classification of stakeholders

Without the involvement and support of stakeholders, organizations will not be able to survive and grow (Bowie, 2019). Different types of stakeholders have different levels of influence on the organization and are affected by the organization's activities. Therefore, scientific criteria need to be developed to manage and classify the many stakeholders from different dimensions. The common classification methods include "multidimensional classification approach" and "Mitchell score-based approach".

The "multidimensional classification approach" classifies stakeholders based on the characteristics of several different dimensions. For example, Freeman (1984) classifies stakeholders along three different dimensions: ownership, economic dependence, and social interest. He considers directors and shareholders as stakeholders with ownership of the enterprise, employees, customers, suppliers, and management as stakeholders with economic dependence, and government agencies, media, and social groups as stakeholders who can influence the enterprise's operations to some extent. Frederick (1988) classifies stakeholders into direct and indirect stakeholders according to whether they have direct market transactions with the enterprise. Savage et al. (1991) identify four types of stakeholders: mixed, supportive, opposed, and marginal, and proposed different management strategies such as participation, monitoring, cooperation, and defense according to different types of stakeholders. Clarkson (1995) classifies stakeholders into primary and secondary stakeholders according to the degree of importance of stakeholders' influence on the enterprise. This method of classifying stakeholders from different dimensions has not been popularized in practice due to its poor operability.

Mitchell et al. (1997) proposed a score-based method that combines stakeholder identification and characteristics to classify stakeholders by quantifying their scores, and this method is referred to as the "Mitchell score-based approach". Mitchell et al. (1997) argue that stakeholders should have one or more of three attributes: power, legitimacy, and urgency. Power refers to the status and ability to influence organizational decisions; legitimacy refers to the legal and moral right to claim to the organization; and urgency refers to the ability of a group's demands to get the immediate attention of the organization's management. Based on different combinations and scores of legitimacy, power, and urgency, stakeholders are classified into three categories: (1) those who have all the three characteristics are definitive stakeholders, including shareholders, employees, and customers, and are the groups that the enterprise needs

to pay close attention to; (2) those who have any two of the three characteristics are expectant stakeholders; and (3) those who have only one of the three characteristics are latent stakeholders. The "Mitchell score-based approach" has become the most used method for classifying stakeholders and has contributed to the application and practice of stakeholder theory.

2.2.4 Stakeholders of public hospitals in China

Public hospitals in China are non-profit organizations funded by the government at all levels to provide healthcare services to all people, and their ownership belongs to the national government or local governments (China's Ministry of Finance & China's Ministry of Health, 2010). Compared with enterprises, public hospitals have very different business goals, and profit is not their main goal. Instead, they should assume social responsibility to their stakeholders. Stakeholder theory had not been introduced into the healthcare sector in China until the 21st century. Since then, many scholars have begun to take an interest in the definition and classification of stakeholders in public hospitals. However, until now there has been no uniform definition of stakeholders in public hospitals among Chinese scholars.

This study conducted a systematic review on the study of stakeholders of public hospital in Chinese literature. Specifically, "public hospital" and "stakeholder" were used as keywords to search, sort out, and summarize the literature published in the 15 years from 2006 to 2020 in the commonly used databases such as China National Knowledge Infrastructure (CNKI), VIP Database, and Wanfang Data. A total of 22 papers containing stakeholders of public hospitals were retrieved (see Table 2.1).

Table 2.1 A review on public hospital stakeholders published from 2006 to 2020

No.	Title of paper/thesis	Author(s) (Year)	Stakeholders
1	Analyzing the Necessity of Building Public Hospitals' Governance Structure Based on Stakeholder Theory	Feng and Xiong (2007)	Government, medical insurance providers, patients, hospital staff, and physician associations
2	Study of the Stakeholders and Their Interests Claims of Public Hospital	Zhong (2009)	Health administration agencies, hospital managers, hospital staff, patients and their families, medical insurance providers, financial departments, food and drug supervision and management departments, and media
3	Definition of Stakeholders and Analysis of Behavior Patterns in the Governance System of Public Hospitals	H. Wu et al. (2010)	Government, patients, clinicians, suppliers, hospital managers, industry associations, insurance agencies, and competitors
4	Train of Thought of the Design on Index System of Performance Evaluation for the Presidents in	Y. F. Zhang (2011)	Government, patients, employees, the public, medical insurance providers, and the media

No.	Title of paper/thesis	Author(s) (Year)	Stakeholders
	Public Hospitals		
5	Research on Organizational Performance Evaluation Indicator System of Public Hospital Based on Stakeholders	Huang (2011)	Customers, competitors, internal employees, partners, suppliers, and functional health authorities
6	Research on Stakeholder-oriented Performance Management Strategy of Public Hospitals	Qian et al. (2012)	Government authorities, patients and their families, hospital managers, clinicians, hospital logistics personnel, suppliers, communities, industry associations, media, the public, and competitors
7	The Study on the Sequence and Classification of Stakeholders of the Public Hospitals	C. X. Zhao (2014)	Government, hospital staff, patients and their families, health supervision departments, other public hospitals, medical insurance providers, and media
8	The Identification of Stakeholders of Public Hospital	Cheng et al. (2015)	Government, hospitals and patients
9	Analysis of Influencing Factors of Comprehensive Performance of Public Hospitals Based on Stakeholder Theory	S. H. Zhu et al. (2015)	Government authorities, suppliers, customers, employees, and competitors in the industry
10	Establishment of Internal Governance Mechanism of Public Hospitals from the Perspective of Stakeholders	Tan (2015)	Government agencies, patients, suppliers, and employees
11	Research on the Common Governance of Public Hospital from the Perspective of Public Interest	Yao (2013)	Clinicians, hospital managers, health authorities, patients, physician associations, and pharmaceutical companies
12	A Study on the Interests of Stakeholders in Public Hospital Reforms	R. F. Wang (2017)	Government-related functional departments, suppliers, patients and their families, competitors or partners, hospital staff, media, and industry associations
13	The Research on the Influence of the Comprehensive Performance from Public Hospitals Stakeholders	Fan (2017)	Hospital managers, clinicians, patients and their families, government, medical insurers, drug (material) suppliers, and hospital competitors
14	Stakeholder Analysis of the Remuneration System of Public Hospitals	H. W. Zhang et al. (2017)	Hospital staff, hospital managers, health authorities, patients and their families, medical insurers, food and drug supervision and administration departments, drug and equipment suppliers, other hospitals, industry associations, and residents of the community
15	Definition and Classification of Stakeholders in Medical Consortiums	N. Zhang et al. (2017)	Hospital staff, suppliers, schools, medical insurance providers, patients and the public, health authorities, and industry associations
16	Division and Cooperation Mechanism of Medical Institutions and Its Implementation Strategy Under the Background of Grading Treatment: Based on the	Xu (2018)	Government, health administration authorities, other medical institutions, patients' families, doctors, and hospital management

No.	Title of paper/thesis	Author(s) (Year)	Stakeholders
	Stakeholder's Perspective		
17	Identification and Classification Management of Stakeholders in Public Hospitals	Liu (2018)	Health administration authorities, public, science and technology management departments, suppliers of drugs and consumables, schools, private medical institutions, township medical and health institutions, medical insurance providers, ecological environment, the media, and industry associations
18	Implementation Strategy of Modern Hospital Management System Based on Stakeholder Analysis	Y. Wang et al. (2018)	Government agencies, other medical institutions, suppliers, media, and patients
19	Issues Related to the Linkage of Medical Insurance System Reform, Healthcare System Reform and Drug Circulation System Reform Based on Stakeholder Theory	S. H. Zheng et al. (2018)	Hospital staff, medical insurance providers, patients, the public, drug administration authority, business administration department, media, schools, industry associations, drug suppliers, and suppliers of medical equipment and consumables
20	The Realization Mechanism of Two-way Referral Based on Stakeholder Theory	Y. C. Chen et al. (2019)	Patients, clinicians, community healthcare service providers, other hospitals, health administration authorities, and medical insurance departments
21	The Application of Stakeholder Theory in Financial Analysis of Public Hospitals	Du (2019)	Government, patients, other public hospitals, clinicians, hospital managers, private hospitals, primary medical institutions, pharmaceutical and equipment suppliers, medical insurance providers, industry associations, the public, and the media
22	Performance Evaluation of Tertiary Public General Hospitals in L City of Guangxi Province	Gao (2019)	Patients, suppliers, government, clinicians, private hospitals, and the media

By categorizing the above 22 papers on public hospital stakeholders, this study classifies healthcare authorities, finance departments, food and drug administrations, price bureaus, business administration departments, and science and technology management departments as "health authorities"; customers and patients as patients, hospital managers, clinicians, hospital logistics staff, administrative staff, and employees as "hospital staff"; private medical institutions, township medical and health institutions, community health service institutions, and other public hospitals as "competitors"; drug suppliers, suppliers of medical equipment and consumables, pharmaceutical companies, and partners as "suppliers"; physician associations and consumer protection associations as "industry associations"; and social residents and the ecological environment as "the public". Therefore, the stakeholders of public hospitals are summarized to include health authorities, hospital managers, patients, hospital employees, competitors, suppliers, industry associations, the public, and the media. These stakeholders are

ranked by frequency in the 22 papers in Figure 2.1.

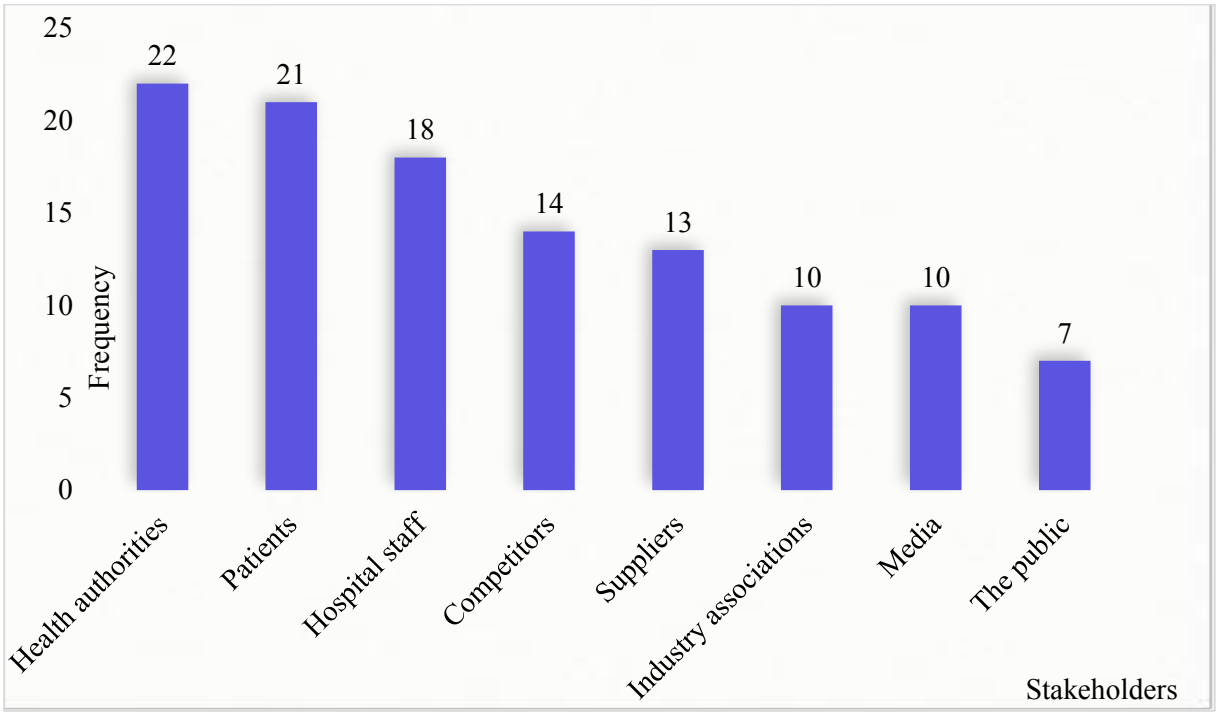


Figure 2.1 Classification of stakeholders of public hospitals

An organization generally has four types of key stakeholders: shareholders, customers, employees, and competitors (Greenley & Foxall, 1996, 1998; Ogden & Watson, 1999). As public hospitals are public interest oriented, their shareholders are health authorities, which usually refer to the financial investors as well as policy and regulation makers (Zou, 2013) and mainly include healthcare authorities and finance departments. Customers, which are the demand side of healthcare services, usually refer to patients. Employees include clinicians as well as hospital managers. Clinicians, who are the direct providers of healthcare products and services, are directly responsible for treatment results and are the core competencies of public hospitals (Fan, 2017); hospital managers mainly refer to the president, party secretary, vice president(s), and department directors, who are the leaders responsible for organizing, coordinating, and controlling the hospital's human and financial resources. Competitors refer to other hospitals at the same level. Each stakeholder has different focuses regarding the outcomes of the operation and development of public hospitals. Specifically, the government focuses on social responsibility and functional positioning; hospital managers the sustainability of operations and realization of social value; clinicians the degree of achievement of career goals and the wellbeing brought by their professions; and patients the quality and safety of healthcare and the increase in medical expenses (Xie et al., 2017).

2.2.5 Stakeholder theory and organizational performance

In recent years, stakeholder theory has been widely used in a variety of fields, including politics, economics, and health, and has had an increasingly far-reaching impact. Emmanuel et al. (1990) argue that organizational performance appraisal should be carried out in multiple dimensions, and the content of the appraisal dimensions may vary over time and among stakeholders. With the evolution of the theory, scholars have begun to pay attention to the relationship between stakeholder theory and organizational performance and have actively conducted exploratory research on the degree of influence of different stakeholders on organizational performance, the development of a scientific and reasonable organizational performance appraisal system, and the application of performance appraisal results.

2.2.5.1 Stakeholder theory and enterprise performance

The survival and growth of an organization depend on the ability of the organization to effectively manage its relationships with various stakeholders (Freeman, 1994). In the late 1980s, scholars began to recognize that in addition to financial indicators, non-financial indicators also have a significant impact on business performance. Kaplan and Norton (1992) proposed the use of a balanced scorecard to evaluate enterprise performance. The balanced scorecard factors in other stakeholders' needs in addition to shareholders' interests in a balanced manner. Since the 1990s, stakeholder theory has been widely used in enterprise performance appraisal and management. Its core idea is that enterprises should not only focus on the interests of shareholders, but also effectively address the needs of stakeholders who have dedicated investments in enterprises and therefore take risks (Jia et al., 2003).

The relationship between stakeholder theory and enterprise performance was first reflected in the research on corporate social responsibility (CSR), which considered corporate performance as an enterprise's social performance. The representative models include the external stakeholder evaluation model proposed by Sonnenfeld (1982) and the Reactive Defensive Accommodative and Proactive (RDAP) model proposed by Clarkson (1995). Sonnenfeld (1982) found through a questionnaire of six forestry companies in the U.S. that external stakeholders' evaluation and internal management's evaluation of the social performance of the companies were inconsistent and significantly different. Besides, different stakeholder groups evaluated the social performance of the same company differently. Another representative model is the RDAP model proposed by Canadian scholar Clarkson (1995), which categorizes corporate stakeholder management strategies into four types: (1) Reactive: The

enterprise denies responsibility and ignores stakeholders; (2) Defensive: The enterprise accepts responsibility but refuses to assume it and only meets legal requirements to deal with stakeholder issues; (3) Accommodative: The enterprise accepts responsibility but expects concessions and simply does what it is required to do; (4) Proactive: The company anticipates responsibility and takes the initiative to do a lot of work to address stakeholder needs. The RDAP model provides a direction for stakeholder management.

Many scholars have conducted empirical studies on the effectiveness of the application of stakeholder theory in enterprise performance appraisal. Donaldson and Preston (1995) provided a comprehensive overview of how enterprises can not only create higher value for their customers, but also achieve better performance by following a stakeholder-oriented approach to management. Waddock and Graves (1997) demonstrated empirically that the core of corporate social performance (CSP) is the relationship between the enterprise and its stakeholders, and that there is a positive relationship between stakeholder need management and CSP. A study on the effectiveness of performance appraisal of well-known companies such as Hewlett-Packard and General Motors led to the conclusion that performance appraisal based on stakeholder theory helps companies to develop a competitive long-term strategy (Atkinson et al., 1997). Luk et al. (2005) conducted an empirical study on the relationship between different stakeholders and enterprise performance based on a sample of 193 service enterprises in China, including Hong Kong, Beijing and Shanghai and analyzed the synergistic and conflicting effects among different stakeholders. The results showed that the synergy effect of linking the three types of stakeholders, namely customers, competitors, and employees, is better than the simple sum of the three. In other words, it has the effect of "1 + 1 > 2", and neglecting any one of these interests can harm business performance. H. H. Chen (2003) conducted field interviews and a questionnaire in nine enterprises in China and found that the interests of different stakeholders in enterprises are complex and conflicting, and the governance process of enterprises needs to follow the principle of balance, while factoring in the needs and conflicting interests of stakeholders.

In summary, stakeholders are defined and categorized differently, and their degree of influence on and importance to an enterprise's performance appraisal varies significantly. Chakravarthy (1986) argues that valuing and balancing stakeholder relationships has a positive impact on enterprise performance. Flak and Dertz (2005) emphasize that different categories of stakeholders of an organization can have different levels of impact on the development of the organization, and the needs of key stakeholders need to be considered in the implementation of the organization's strategic objectives. Besides, it is obviously very difficult for enterprises to

satisfy all the demands of different stakeholder groups and individuals (Greenley & Foxall, 1996)). This is due to the conflicting interests of the stakeholders and the limited resources and management capabilities of the enterprise (Amit & Schoemaker, 1993). Therefore, enterprises need to balance the needs of various stakeholders in the performance appraisal process as much as possible, and emphasizing only a single type of stakeholder can affect the improvement of organizational performance to the detriment of organizational development (Slater & Narver, 1995).

2.2.5.2 Stakeholder theory and hospital performance

Stakeholders' demands in hospitals are more diverse, complex, and even contradictory than those in enterprises. Therefore, application of stakeholder theory to hospital performance appraisal is bound to face more challenges. This is particularly true in public hospitals, which need to ensure the public interest and implement functional positioning while achieving a balance between social and economic benefits to ensure sustainable development.

In the performance management reform in public hospitals in China, managers play a pivotal role in handling and balancing the relationships among key stakeholders and meeting the demands of all stakeholders. Some Chinese scholars have already introduced stakeholder theory in exploring comprehensive performance appraisal and management of public hospitals. For example, D. M. Zhang (2006) applied stakeholder theory to hospital management and found that the biggest challenge for hospital managers is to maintain a dynamic balance among various interest groups, meet the frequent and competing demands of each group, and ultimately achieve a win-win situation for all parties. A. W. Wu (2008) explored the associations between hospital key stakeholders (patients, competitors, employees, and government) oriented management and public hospital performance based on the case of a nonprofit public hospital and constructed a stakeholder orientation and performance relationship model. An analysis based on structural equation modeling (SEM) reveals that key stakeholders such as government, hospital managers, clinicians, and medical insurance providers have a significant impact on the comprehensive hospital performance (Fan, 2017). Theoretical analysis and empirical research both indicate that the behavioral variables of each stakeholder directly affect the comprehensive performance of public hospitals.

With reference to the existing research on definition and classification of the stakeholders of public hospitals and based on the stakeholder definition given by Freeman (1984) emphasizing "who can affect or is affected by the achievement of the organization's objectives", this study argues that the stakeholders of performance appraisal in tertiary public hospitals are

individuals and groups who have interests in the process of performance appraisal implementation and are able to influence the performance appraisal results to the greatest extent while being influenced by the performance appraisal implementation process. Public hospitals are relatively complex organizations where different stakeholders contribute to and influence hospital performance appraisal to different degrees. Therefore, it is necessary to first identify the key stakeholders of public hospitals and the extent to which the "National Appraisal" indicators are related to these key stakeholders. Based on this, this study puts forward the first research question:

RQ1: Who are the key stakeholders of tertiary public hospitals? To what extent are the "National Appraisal" indicators related to these key stakeholders? Are the demands of the key stakeholders balanced and taken into due account?

To answer this research question, this study first identified eight different types of stakeholders based on the definition and classification of stakeholders in public hospitals in the existing literature, then selected experts who had been engaged in hospital management for many years, and identified the key stakeholders of public hospitals using the Delphi method. It also elaborated on the degree of influence of different stakeholders on organizational performance and explored the extent to which the "National Appraisal" indicators are related to these key stakeholders. The details are described in Chapter 3.

2.3 The balanced scorecard

2.3.1 The balanced scorecard

In the 1990s, it was recognized that the conventional performance management model, which focused only on financial indicators, was not conducive to long-term organizational growth and that intangible assets were important to the success of a company (Johnson & Kaplan, 1991). In this context, Robert S. Kaplan, a professor at the Harvard Business School, and David P. Norton, founder of Renaissance Solutions, Inc., published a landmark article entitled "The Balanced Scorecard: Measures that Drive Performance" in the *Harvard Business Review*, officially introducing the concept and model for measuring organizational performance from four perspectives, namely financial, customer, innovation and learning, and internal process, and driving performance improvement (Kaplan & Norton, 1992). In 1993, the two professors published a second article in the *Harvard Business Review* entitled "Putting the Balanced Scorecard to Work" in which they introduced the successful experiences of several enterprises

using the balanced scorecard and described in detail its implementation and operability (Kaplan & Norton, 1993).

With the popularization of the balanced scorecard, the two professors gradually shifted their research focus from organizational performance appraisal to strategic management research of organizations, which added further contents to the balanced scorecard and developed it into a set of logical and rigorous strategic management system. In 1996, the two professors published their third article entitled "Using the Balanced Scorecard as a Strategic Management System", focusing on the application of the balanced scorecard to the four major processes of strategic management: translating the vision, communicating and linking, business planning, as well as feedback and learning (Kaplan & Norton, 1996b). In the same year, the book entitled *The Balanced Scorecard: Translating Strategy into Action* was published, focusing on the process of using the balanced scorecard for strategic management, translating the strategic goals of the company into daily actions of employees, and transforming intangible assets such as the organization's mission and vision into concrete, tangible and measurable action goals to help managers overcome the challenges of executing strategy (Kaplan & Norton, 1996a). The publication of this book marked the rise of the balanced scorecard from a performance measurement tool to a strategic management tool. It is obvious that the balanced scorecard plays an important role in the performance and strategic management of organizations.

The balanced scorecard emphasizes the "balance" of performance appraisal and establishes a performance appraisal system through the four dimensions of financial, customer, internal business process, and learning and growth with causal relationships, providing organizations with a relevant and operable performance management framework. How can the balanced scorecard be used to drive an organization's strategy execution, effectively linking performance appraisal to strategic goals and providing a tool for visualizing strategic communication and strategic management? To this end, Kaplan et al. (2001) furthered the application of the balanced scorecard to strategic management in the following years, proposing five principles for building a strategy-centered organization to drive change. Later, based on the "four dimensions" of the balanced scorecard, Kaplan and Norton (2004) further studied and analyzed strategy management and proposed a strategy execution system with strategy maps and the balanced scorecard as the core, emphasizing that strategy can only be effectively managed though accurate description and measurement. Following that, they published their book on how to use the balanced scorecard to create corporate synergies (Kaplan & Norton, 2006).

Since its inception, the balanced scorecard has attracted considerable research interest. In addition to Kaplan and Norton, the two founders of the balanced scorecard, who have continued

to explore and facilitate the successful application of the balanced scorecard in different types of organizations, other scholars have also actively explored the balanced scorecard in performance management and strategic management to further refine and develop its application. For example, Niven (2002) elaborated on the relevant characteristics of the balanced scorecard as a performance management tool from its development to its application and final results. Following that, Niven (2003) published a book entitled *Balanced Scorecard: Step-by-step for Government and Nonprofit Agencies* in which he elaborated on the operational guidelines and application key points of the balanced scorecard for governments and nonprofit organizations and constructed a general framework for translating an organization's strategy into specific operational objectives and implementation indicators.

Speckbacher et al. (2003) argue that there are three types of balanced scorecards according to the different stages of implementation. The first type combines financial and non-financial (customer, internal business, learning and growth) indicators to form a strategic performance measurement framework with four classical dimensions that do not incorporate causality; the second type focuses on the causal relationship between performance indicators and strategic goals, in which a strategy map is used to illustrate the link between indicators and strategy; and the third type develops a motivation-related strategic control system that helps to implement strategy by defining goals, action plans and incentives, and is described through causality, where communication alone cannot change an organization's behavior. Banker et al. (2004) stated that the balanced scorecard as a comprehensive performance appraisal method needs to be integrated with strategy and is very helpful in facilitating the achievement of organizational goals. Kunc (2008) argued that the successful application of the balanced scorecard by companies has enabled the enhancement of the strategy map to effectively control the overall performance results. It is also believed that the use of the balanced scorecard by organizations in combination with the strategy map management model can improve organizational performance and service quality (Ledin & Machin, 2016).

In summary, the balanced scorecard, as a scientific performance appraisal tool, breaks through the limitations of evaluating with a single financial indicator and adds non-financial indicators to measure organizational performance, driving organizational performance improvement from four dimensions (Kaplan & Norton, 1992). With the introduction of the strategy map by Kaplan et al. (2004), the balanced scorecard gradually rose from a performance measurement tool to a strategic management tool, effectively transforming strategic objectives into measurable and actionable targets according to the four dimensions of the balanced scorecard, and interconnecting and driving each indicator to solve many problems in the

implementation of strategy execution, thereby providing a visual tool for strategic management (Kaplan, 2001; Kaplan et al., 2004; Kaplan & Norton, 2004).

2.3.2 Framework of the balanced scorecard

As a tool for performance measurement and strategic management, the balanced scorecard effectively links performance appraisal and strategic goals, provides decisions about strategic goals in four interrelated and causally related dimensions, and forms a basic framework for performance appraisal with operational guidance centered on the organization's strategic goals, making the organization's strategic goals operational and measurable (Kaplan & Norton, 1996a) (see Figure 2.2).

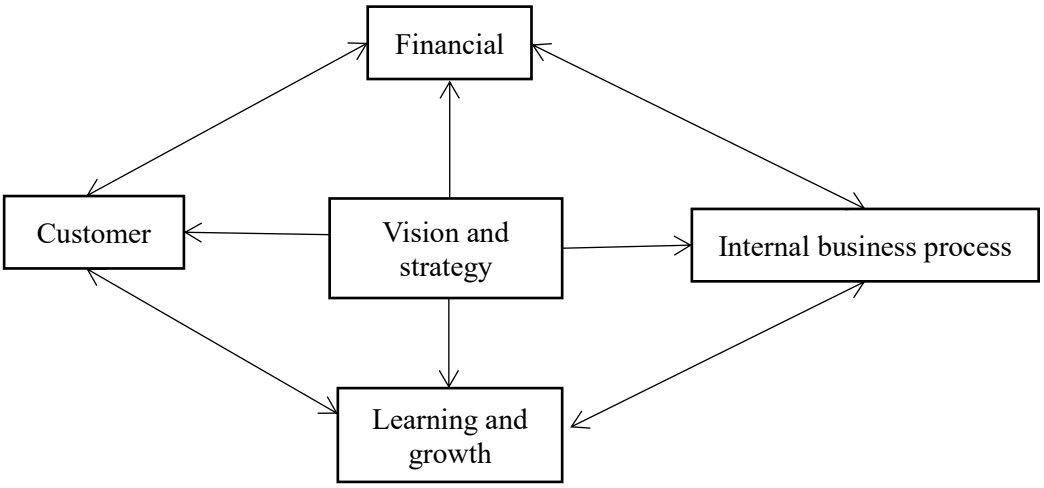


Figure 2.2 Basic framework of the balanced scorecard

Source: Kaplan and Norton (1996a)

Kaplan (2009) defined the four dimensions of the balanced scorecard in his book entitled *Conceptual Foundations of the Balanced Scorecard* and emphasized the existence of causal and logical relationships and interactions among the four dimensions, suggesting that organizations should give full play to the internal functional factors in the process of implementing strategy, breaking it down and keeping it balanced at all levels.

(1) Financial dimension

How do we see shareholders? For enterprises, financial indicators reflect the financial status and economic efficiency, mainly through the assessment of revenue growth and cost control, commonly referred to as "increasing income and reducing expenditure". Financial indicators are of primary concern to for-profit organizations as they reflect sales, profitability, return on investment, and asset utilization. The financial dimension is more concerned with the interests of shareholders and investors.

(2) Customer dimension

How do customers perceive us? Enterprises win market share by providing products or services to target customer groups. Therefore, many enterprises adhere to the principle of "putting customers first". Customer loyalty and satisfaction are the key to financial revenue and profit as well as the basis for survival and development. The customer dimension encompasses the way in which differentiated and sustainable value is created for the target customer and the satisfaction of the customer's need for that value (Roy & Wetter, 2001). The balanced scorecard emphasizes translating customer service requirements into specific measures, and the indicators of the customer dimension can reflect the market changes of enterprises, such as market share and customer satisfaction. It is necessary to focus on customers' interest demands and improving customer satisfaction and then translate these indicators into specific goals towards solutions.

(3) Internal business process dimension

What must a company be good at? The internal business process dimension reflects the competitive advantage of a company's internal process and operations management, which can generate future value for the company (Kaplan et al., 2004). Products and services are the two core competencies of a company. Improving and optimizing internal business process can help a company to continuously produce and develop products that customers expect, attract, and develop customers, while reducing and improving costs and increasing productivity. Improving processes is a driver of shareholder and customer satisfaction (Kaplan & Norton, 2004). Based on customers' measurement criteria, companies need to measure what must be done internally to meet customer expectations. Focusing on internal process optimization can improve customer satisfaction and motivate employees to think proactively to find improvements and enhance core competencies (Ma, 2009). Therefore, the management of the company needs to focus on those key internal business processes that can meet the needs of customers and ensure that all employees in the organization have clear goals for actions, decisions and improvement activities that will help the company to achieve its mission.

(4) Learning and growth dimension

Can enterprises continuously improve and create value? In their book entitled *Strategy Maps: Converting Intangible Assets into Tangible Outcomes*, Kaplan et al. (2004) classified the intangible assets of an organization and their roles in strategy into three categories: human capital, information capital, and organizational capital. It is evident that human capital is related to the strategic development of an organization, and the development of high-quality talents is a source of energy for the long-term development of any organization. The learning and growth dimension reflects the company's investment in talent development to ensure that the

organization has long-term development capability. It also reflects the important role of the organization's intangible assets in the organization's development strategy. An organization's ability to innovate depends on its ability to develop talents. Therefore, it needs to provide training and learning opportunities for employees to increase employee engagement and enhance the organization's ability to innovate and grow. The learning and growth dimension is an enabler for the other three dimensions to be realized effectively and can effectively contribute to the optimization of the organization's internal business process, customer satisfaction, financial wellbeing, and ultimately the achievement of the company's strategic development goals. The company's ability to innovate, improve, and learn is directly related to its value.

Among the four dimensions mentioned above, the financial dimension is the ultimate goal, the customer dimension the key, the internal business process dimension the basis, and the learning and growth dimension the core (Niven, 2003). Members of an organization need to continuously learn and grow, continuously improve the internal business process, and provide satisfactory products or services to customers for the purpose of realizing the sustainable development of the organization's financial goals.

2.3.3 Characteristics of the balanced scorecard

As a performance measurement tool and strategic management tool, the balanced scorecard has the following characteristics:

(1) Effective balance

The core principle of the balanced scorecard is "balance". In the process of implementing the balanced scorecard, an organization can achieve a dynamic balance between financial and non-financial goals, between long-term and short-term goals, between internal and external indicators, as well as between leading and lagging indicators (Kaplan & Norton, 1996a), helping the organization to establish a multi-dimensional and balanced performance appraisal system, which is beneficial to the long-term development of the organization

(2) Focus on key stakeholders

The balanced scorecard implements organizational performance appraisal through four dimensions with causal relationships, focuses on key stakeholders who are closely linked to organizational performance, and reflects stakeholder requirements in a targeted manner. The financial dimension focuses on the interests of shareholders and investors; the customer dimension emphasizes the attitude and satisfaction of customers towards the organization; the internal business process dimension focuses on optimizing internal processes to meet the needs of shareholders and customers; and the learning and growth dimension underscores the

competencies and interests of employees. The balanced scorecard is definitely a performance management tool that integrates the interests of stakeholders' needs (J. D. Zhang & Xu, 2014).

(3) Strengthened connection between strategy and performance management with strategy as the core

A performance management framework can help organizations translate strategic goals into measurable objectives, thus aligning employees' daily behaviors with corporate strategy (Mintzberg & Quinn, 1998). The balanced scorecard emphasizes strategy as the core and effectively aligns the organization's strategic goals with performance management so that the organization's strategic goals are translated into concrete actions, and the strategic goals are effectively implemented through measurable indicators and target values. Finally, through regular review of performance appraisal results, the enterprise management is guided to make adjustment decisions on the indicators and target values of the strategy (Y. Y. Yang, 2019). The balanced scorecard is a tool used to calibrate measures for the concrete implementation of organizational strategies and to control organizational performance (Galloway, 2010).

(4) Emphasis on coordination and communication within the organization

The implementation of an organization's strategy requires the participation of employees at different levels, and the balanced scorecard can improve management efficiency through good communication and collaboration among different departments and employees at different levels. The balanced scorecard constructs a horizontal and longitudinal performance appraisal system from four dimensions, clarifies the logical relationship of organizational synergy, clearly defines the responsibilities, rights and benefits of each department of the organization, reduces interdepartmental communication friction within the enterprise, and achieves good communication effects.

2.3.4 Application of the balanced scorecard to healthcare organizations

The balanced scorecard is one of the most popular management tools and techniques (Andon et al., 2005). The *Harvard Business Review* even referred to it as one of the most influential management concepts of the 20th century. After more than two decades of development and refinement, the scope of application of the balanced scorecard has been gradually extended from enterprises to health authorities and non-profit organizations, especially in the non-profit healthcare sector.

2.3.4.1 Application of the balanced scorecard in the healthcare sector outside China

Although the balanced scorecard was originally used to improve performance management in

for-profit organizations, Kaplan (1999) suggested that the transition of the balanced scorecard to nonprofit organizations was fairly straightforward in early days. Kaplan (2001) specifically pointed out that the balanced scorecard is just as beneficial in improving the implementation of nonprofit organizations, emphasizing that nonprofit organizations are more focused on their mission achievement and social benefits rather than economic benefits. The balanced scorecard was first successfully applied to healthcare service organizations in developed countries. In 1996, healthcare organizations in the U.S. were the first to apply the balanced scorecard to healthcare organizations for strategic management and achieved good results. The application was more common and mature in the field of healthcare management in the U. K., Sweden, and Australia, and then this management tool was gradually adopted by healthcare organizations in many advanced countries around the world and achieved good results, with application studies at different levels such as early performance appraisal, quality evaluation, and strategic management (Voelker et al., 2001). MacStravic (1999) argues that a true balanced scorecard is beneficial to the healthcare sector in focusing on internal operations, motivating internal stakeholders, increasing customer insight, improving loyalty, and strengthening customer relationships.

After extensive market research and analysis, top executives believe that application of the balanced scorecard in healthcare organizations has great potential (MacStravic, 1999). According to a survey in the U. S., the healthcare sector turned out to have the highest level of satisfaction with application of the balanced scorecard among all industries (McDonald, 2012). Inamdar et al. (2002) conducted a qualitative study of nine nonprofit hospitals that implemented the balanced scorecard by interviewing their managers in terms of their motivation for adopting the balanced scorecard, the major challenges and barriers they encountered, as well as the benefits they gained. They concluded that the balanced scorecard is a very beneficial tool to organizations in the healthcare sector for performance management and strategic management, and that the performance of the healthcare system is different from other organizations in that improvement in efficiency is a limited perspective. In practical application, it is important to balance efficiency, cost and quality to provide efficient and accessible care to patients. Zelman et al. (2003) found in their research that the balanced scorecard had been adopted by a wide range of healthcare organizations, including hospitals, psychiatric treatment centers and national healthcare organizations, arguing that the use of the balanced scorecard as a performance management tool is conducive to fiscal management.

Walker and Dunn (2006) state that the balanced scorecard should establish patient-centered strategies in hospitals by monitoring and evaluating the progress and effectiveness of the

hospital's strategic goals. Subsequently, public health systems in some developing and low-income countries also started to apply the balanced scorecard. Evidence from a five-year evaluation of the balanced scorecard application in the Afghan healthcare system showed that Afghanistan pioneered the adoption of a balanced scorecard performance management system to manage healthcare services (Edward et al., 2011). By doing so, it integrated the vision and strategy of the healthcare sector. Impagliazzo et al. (2009) argue that in healthcare organization development and application, the balanced scorecard serves as a strategic management tool to clarify the strategic goals of healthcare organizations, monitor and evaluate the implementation of strategies, and create effective communication and collaboration mechanisms. The balanced scorecard is considered the most appropriate performance appraisal framework for hospitals that can provide information related to internal and external factors that contribute to the success of the organization (Shukri & Ramli, 2015).

The balanced scorecard as a strategy implementation tool is a conceptual tool that can overcome the limitations of the four dimensions (Sasse, 2005). The balanced scorecard proposed by Kaplan and Norton (1992) encompasses four perspectives - financial, customer, internal process, and innovation and learning. Later, in their book entitled *Balanced Scorecard: Translating Strategy into Action*, they mentioned that the four dimensions of the balanced scorecard are highly adaptable and that there is no mathematical theorem stating that these four dimensions cannot be changed and that different perspectives can be added depending on the characteristics of the organization. It is recommended that each dimension of the balanced scorecard should be composed of no more than five indicators, and the total number of indicators should be limited to 20 to 25. The number of indicators is related to the cost or resources required to collect and analyze data in the evaluation process (Kaplan & Norton, 1996a). In adopting a balanced scorecard for nonprofit organizations, it is necessary to develop the best perspective for the balanced scorecard based on the organization's strategy, such as adding a "mission" perspective (Kaplan et al., 2001).

The four dimensions of the balanced scorecard are not static and can be adapted and modified for different organizations, and its flexibility is part of its appeal (Behrouzi et al., 2014). It is a challenge for organizations to decide how many indicators to choose for a balanced scorecard-based performance appraisal indicator system. Gurd and Gao (2008) did a case study on the use of the balanced scorecard in healthcare organizations. The results showed that few healthcare organizations directly applied the traditional four dimensions of the balanced scorecard proposed by Kaplan and Norton (1992). Most of them modified the original four dimensions of the balanced scorecard according to the status of the organization. For example,

some organizations included customer, cost, learning and growth, and internal process as the dimensions of the balanced scorecard; others included finance, innovation and growth, care and service, and system integration. The number of indicators range from 13 to 44.

Using a mixed study approach based on the balanced scorecard, Rahimi et al. (2017) selected a total of 22 suitable indicators for hospital performance appraisal from internal process, financial, innovation and learning, and customer dimensions, respectively. Meanwhile, they suggested that the balanced scorecard model is flexible and can be a useful tool for evaluating and comparing hospital performance. Drawing on the balanced scorecard, Griffith et al. (2002) established a hospital performance appraisal indicator system composed of nine dimensions such as asset depreciation, working capital, complications, mortality, average case cost, and length of stay. In the field of healthcare, many scholars have done a lot of research on the indicators of hospital performance appraisal, the establishment of the indicator system and the allocation of indicator weights, and have developed an extensive and detailed performance appraisal system (Pieper, 2005). Table 2.2 summarizes the selection of different perspectives on the implementation of the balanced scorecard in selected healthcare organizations in the U.S. and the U.K.

Table 2.2 Dimensions of the balanced scorecards implemented in the U.K. and the U.S.

Author(s) (Year)	Country	Main perspectives
Chow et al. (1998)	The U.K.	An emphasis on indicators related to image and reputation
Santiago (1999)	The U.S.	Quality of care is measured in five dimensions: financial, outcome, customer, learning & growth, and internal process
Curtright et al. (2000)	The U.S.	The Mayo Clinic in Minnesota, U.S. introduced the balanced scorecard to establish a performance management and measurement system consisting of seven dimensions, namely, clinical productivity and efficiency, financial, mutual respect and diversity, internal operations, social commitment, external environment assessment, customer satisfaction, and patient characteristics.
Protti (2002)	The U.K.	The UK Department of Health used the balanced scorecard to evaluate the performance of NGS' "information technology strategy" based on four perspectives: financial, internal business process, customer, as well as learning and growth.
Gumbus et al. (2003)	The U.S.	A case study of Bridgeport Hospital in the U.S., where performance assessment dimensions include financial indicators but also require quality, staff retention and patient satisfaction. The balanced scorecard provides a framework for measuring performance in a complex and changing healthcare environment.
Carini et al. (2020)	The U.K.	The performance appraisal indicators of medical institutions mainly contain four dimensions, namely patient centeredness, effectiveness, efficiency, and safety.

2.3.4.2 Application of the balanced scorecard in the healthcare sector in China

China introduced the balanced scorecard relatively late. It is still in the exploration stage and needs to learn from the advanced international management ideas and experiences. Taiwan was the first to introduce and implement the balanced scorecard performance appraisal system in the healthcare sector. In 2002, MacKay Memorial Hospital in Taiwan was the first to introduce the balanced scorecard to hospital performance management and then required relevant departments in the hospital to apply this tool. Taipei Veterans General Hospital and Chang Gung Memorial Hospital have also applied the balanced scorecard to hospital performance appraisal and achieved significant results (Chang et al., 2008). Scholars from the Chinese Mainland have also been exploring the application of the balanced scorecard in the healthcare sector. A search of the publications in Chinese journals on CNKI using the keyword "hospital balanced scorecard" showed that the first article on the use of balanced scorecard in hospital management was entitled "Case Analysis of Performance Management in Foreign Medical Institutions" published by Zhai et al. (2004) which summarized the design, development, and application of the balanced scorecard in nine U.S. medical institutions and the possible problems they encountered. It recognized the balanced scorecard as an effective management tool for medical institutions. The Balanced Scorecard: Step-by-step for Government and Nonprofit Agencies published by Niven (2003) demonstrates how to design a balanced scorecard for government and nonprofit agencies, focusing on the guidelines and key points for application of the balanced scorecard.

It is not advisable for Chinese public hospitals to directly imitate or copy foreign examples of successful applications of the balanced scorecard; instead, the application must be tailored. Some Chinese scholars have taken a positive view of the implementation of the balanced scorecard in hospitals and have obtained empirical evidence through single case. Bi and Liu (2011) argue that the balanced scorecard is important in helping public hospitals to improve social benefits while improving the quality of care and hospital operations as well as training hospital personnel. S. H. Zheng et al. (2018) illustrated in an empirical study that Hospital A started to experiment with the practical application of balanced scorecard in hospital economic management since 2010, which helped the hospital to realize the effective use of resources and achieve the strategic and management goals. Duan (2016) established the balanced scorecard performance appraisal system with reference to the strategic goals of the hospital and proposed that the balanced scorecard could adjust the performance indicators in a timely manner according to the strategic goals of the hospital to improve the performance management system

and achieve the long-term goals of the hospital.

H. P. Luo et al. (2017) collected ten years of performance data on the application of the balanced scorecard in Chengfei Hospital in Sichuan Province. The analysis results show that the indicators of the four dimensions were significantly improved in the initial stage of implementation, and they significantly contributed to improving healthcare quality and safety and reducing costs. Nevertheless, in the course of continuous implementation, it is necessary to adjust and optimize the indicators of each dimension according to the strategy and to continuously follow up on feedback. Based on the framework of the balanced scorecard theory, D. X. Zheng and Xu (2017) combined the contents of Hospital T's strategic planning, transformed strategic objectives into measurable indicators according to the four dimensions of the balanced scorecard, effectively integrated organizational strategy with performance evaluation, and translated strategic objectives into employees' daily actions. J. Y. Liu et al. (2019) summarized the experience of the ten steps of introducing the balanced scorecard in public hospitals by analyzing the experience of Henan Cancer Hospital in the process of building a performance management system with the balanced scorecard. Using Tianjin Jinan Hospital as a case, H. G. Sun (2021) observed its application of the balanced scorecard in performance management and made comparisons among several groups. The results showed that the observation group applying the balanced scorecard reported higher levels of patient satisfaction, growth in the percentage of net financial income, and fast progress of clinicians, and the differences were statistically significant.

Some Chinese scholars also found that implementing the balanced scorecard in hospitals is not an easy task and can face more challenges than in enterprises. The balanced scorecard is a complex hospital performance management system that needs to be integrated with the hospital management's own characteristics and strategic goals. The measurement indicators are initially designed according to the four dimensions of the balanced scorecard, emphasizing that both senior executives and ordinary employees must attach great importance to the entire performance management system and take an initiative to cooperate (Cui, 2004). F. Zhang and Liu (2005) regarded the balanced scorecard as a "compass" for hospital management in a complex environment, and its practical application needs to be aligned with its own functions, tasks and workflow. Not all hospitals have been successful in developing and implementing the balanced scorecard. J. H. Zhang et al. (2017) conducted a questionnaire on the status of balanced scorecard application in public hospitals above Grade A secondary hospitals in Guangdong Province, in which 40 hospitals and 80 hospital managers were selected according to random sampling. The results showed that only four hospitals were using the balanced

scorecard, and even some hospital managers had never heard of the balanced scorecard and thus rarely used the balanced scorecard as a performance and strategic management tool.

Kaplan and Norton (2004) discussed four main difficulties that organizations encounter in applying the balanced scorecard: (1) unclear strategy, (2) difficulty in decomposing indicators, (3) lack of collected data, and (4) inadequate internal communication. Due to the special characteristics of the healthcare sector, the scientific nature of indicator selection and indicator weighting can be more challenging than that of companies in performance appraisal in addition to the above-mentioned four difficulties (Schalm, 2008).

The four dimensions of the balanced scorecard form a basic strategy-oriented framework, and many Chinese scholars have carried out research on the dimensions and indicators of the balanced scorecard in public hospitals. Table 2.3 presents the perspectives and indicators selected by Chinese scholars for applying the balanced scorecard to hospitals.

In summary, the balanced scorecard, as an advanced tool for strategy-oriented performance measurement, emphasizes the core idea of "balance". The financial dimension reflects the interests of shareholders; the customer dimension focuses on the interests of customers; the learning and growth dimension underlines the interests of employees; and the internal business dimension underscores the interests of employees and customers. The four dimensions are balanced and drive each other (Kaplan & Norton, 1992). The balanced scorecard can also be applied to nonprofit organizations where the indicators of the stakeholder dimensions can be modified and adjusted based on the needs of organizations (J. W. Wang, 2018).

Table 2.3 The perspective of applying the balanced scorecard to hospitals in China

Author(s) (Year)	Main perspectives
X. Zhuang et al. (2006)	Selection of 34 indicators from five dimensions, including social benefits, work quality, work efficiency, asset operation, and development potential
D. Y. Zhang et al. (2007)	Establishment of an indicator system composed of four dimensions: patients, quality of care, organizational operation, as well as development and innovation
Tang (2008)	Construction of a performance appraisal indicator system for general public hospitals consisting of four primary indicators, namely patient, process, innovation and learning, and financial dimensions, 13 secondary indicators and 48 tertiary indicators
P. L. Zhang et al. (2009)	The performance appraisal system of Chongqing Ninth People's Hospital was analyzed from the four dimensions of the balanced scorecard: financial, patient, process, and learning and growth, integrating the five elements of

Author(s) (Year)	Main perspectives
	hospital resources: people, finance, materials, information and time, resulting in 12 Level 2 indicators and 39 Level 3 indicators. The results show that the balanced scorecard is effective in controlling the excessive growth of medical expenses, effectively controlling costs, and improving efficiency.
Guan (2012)	The Delphi method and analytic hierarchy process were used to establish a performance appraisal indicator system for Hospital M's Performance Management Cycle System, which contains 11 objectives, four Level 1 indicators, and 38 secondary indicators based on the four dimensions of the balanced scorecard.
Guo et al. (2013)	Identification of 22 performance appraisal indicators based on the three dimensions of social benefits, economic benefits and sustainable development of public hospitals
L. Wang (2013)	In light of the status quo of Deyang People's Hospital, the four dimensions of the balanced scorecard were used to translate the hospital's strategic objectives into 36 specific key performance indicators (KPIs) by decomposing them layer by layer, forming a perfect performance appraisal system.
J. W. Wang (2018)	A five-dimensional balanced scorecard performance appraisal indicator system consisting of 11 Level 2 indicators was constructed for Hospital W. The social responsibility dimension was added to the traditional four dimensions of the balanced scorecard to assess the return of public hospitals to public interest orientation through the measurement of hospital social responsibility.

However, so far China is still in the stage of exploration as not many public hospitals in China have successfully applied the balanced scorecard. Organizations can construct a balanced scorecard that matches their development status according to industry characteristics and different strategies. But there are no clear answers to how many dimensions and how many specific appraisal indicators are sufficient (Y. M. Hu, 2010). The "National Appraisal" indicators for tertiary public hospitals have been guiding public hospitals to implement functional positioning and patient-centeredness, highlighting the characteristics of the four dimensions of the balanced scorecard. However, there are few existing studies analyzing the "National Appraisal" indicators from the perspective of the balanced scorecard.

This study selected 31 out of the 55 "National Appraisal" indicators (including 26 national monitoring indicators) and invited experienced hospital managers to categorize the 31

indicators into the four dimensions of the balanced scorecard. In this sense, this study is a pioneering one and will answer the second research question:

RQ2: How should the key indicators of the "National Appraisal" be categorized into the four dimensions of the balanced scorecard?

2.4 The "National Appraisal" of tertiary public hospitals in China

Kaplan and Norton (1996a) argue that "If you can't measure it, you can't manage it (p. 21)." The management guru Peter Drucker also put forward a similar idea in his book entitled Harvard Business Review on Measuring Corporate Performance (Drucker, 1998). Armstrong and Baron (2005) mention that quantifying performance goals through performance measurement contributes to an effective performance management process. In 2019, the Chinese government established a unified performance appraisal for tertiary public hospitals (referred to as the "National Appraisal" below) indicator system.

2.4.1 The "National Appraisal" indicators

The "National Appraisal" consists of three levels of performance appraisal indicators: four Level 1 indicators concerning healthcare quality, operational efficiency, sustainable development, and satisfaction, 14 Level 2 indicators, and 55 Level 3 indicators (including 50 quantitative indicators and five qualitative indicators), of which those indicated with a ▲ label are key appraisal indicators monitored by the state authority (See Table 2.4).

Table 2.4 Framework of performance appraisal indicator system for tertiary public hospitals

Level 1 indicator	Level 2 indicator	Level 3 indicator (Indicator No. and name)	Indicator attribute	Indicator orientation
Healthcare quality	(I) Functional positioning	1. Ratio of the number of outpatients to the number of discharges	Quantitative	Monitoring for comparison
		2. Number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations)	Quantitative	Gradual increase↑
		3. Proportion of day surgeries to elective surgeries	Quantitative	Monitoring for comparison
		4. Proportion of discharged patients who underwent a surgery▲	Quantitative	Gradual increase↑
		5. Proportion of discharged patients who underwent a minimally invasive surgery▲	Quantitative	Gradual increase↑
		6. Proportion of discharged patients who underwent a Level 4 surgery▲	Quantitative	Gradual increase↑
		7. Proportion of special need medical services	Quantitative	Monitoring for comparison

Level 1 indicator	Level 2 indicator	Level 3 indicator (Indicator No. and name)	Indicator attribute	Indicator orientation
Operational efficiency	(II) Patient safety	8. Incidence of postoperative complications▲	Quantitative	Gradual decrease↓
		9. Surgical site infection rate of aseptic operations▲	Quantitative	Gradual decrease↓
		10. Single-disease quality control▲	Quantitative	Monitoring for comparison
		11. Positive rate of large equipment examination	Quantitative	Monitoring for comparison
		12. Large medical equipment maintenance and quality control management	Qualitative	Monitoring for comparison
		The number of clinical test items that have passed the national external quality assessment▲	Quantitative	Gradual increase↑
	(III) Rational drug use	14. Mortality rate of cases in the low-risk group▲	Quantitative	Gradual decrease↓
		15. Quality nursing service ward coverage	Quantitative	Gradual increase↑
		16. Ratio of reviewed prescriptions to the total number of prescriptions	Quantitative	Gradual increase↑
		17. Intensity of antibiotic usage (DDDs)▲	Quantitative	Gradual decrease↓
		18. Proportion of basic drug prescriptions for outpatients	Quantitative	Gradual increase↑
		19. Utilization rate of essential drugs for inpatients	Quantitative	Gradual increase↑
		20. Proportion of varieties of essential medicines purchased	Quantitative	Gradual increase↑
		21. Proportion of sum of bid-winning drugs in centralized procurement of drugs organized by the state	Quantitative	Gradual increase↑
	(IV) Service process	22. Average appointment rate for outpatients	Quantitative	Gradual increase↑
		23. Average waiting time after outpatient appointment	Quantitative	Gradual decrease↓
		24. Function application level of the electronic medical record▲	Qualitative	Gradual increase↑
	(V) Resource efficiency	25. Number of inpatients per doctor per day	Quantitative	Monitoring for comparison
		26. Number of pharmacists per 100 beds	Quantitative	Monitoring for comparison
	(VI) Balance of payments structure	27. Proportion of outpatient revenue to medical revenue	Quantitative	Monitoring for comparison
		28. Percentage of outpatient revenue from medical insurance funds	Quantitative	Monitoring for comparison

Level 1 indicator	Level 2 indicator	Level 3 indicator (Indicator No. and name)	Indicator attribute	Indicator orientation
		29. Proportion of hospitalization income to medical income	Quantitative	Monitoring for comparison
		30. Proportion of inpatient income from medical insurance funds	Quantitative	Monitoring for comparison
		31. Proportion of medical service revenue (excluding drugs, consumables, examination and testing revenue) to medical revenue▲	Quantitative	Gradual increase↑
		32. Proportion of revenue from adjuvant drugs	Quantitative	Monitoring for comparison
		33. Proportion of personnel expenditure to business expenditure▲	Quantitative	Gradual increase↑
		34. Energy consumption expenditure per ten thousand yuan of income▲	Quantitative	Gradual decrease↓
		35. Balance of income and expenditure▲	Quantitative	Monitoring for comparison
		36. Asset-liability ratio▲	Quantitative	Monitoring for comparison
		37. Medical income growth rate	Quantitative	Monitoring for comparison
	(VII) Cost control	38. Rate of increase in outpatients' medical expense per visit▲	Quantitative	Gradual decrease↓
		39. Rate of increase in outpatients' medication expense per visit▲	Quantitative	Gradual decrease↓
		40. Rate of increase in average medical expense per inpatient▲	Quantitative	Gradual decrease↓
		41. Rate of increase in average medication expense per inpatient▲	Quantitative	Gradual decrease↓
	(VIII) Economic management	42. Total budget management	Qualitative	Gradual improvement
		43. Standardize the establishment of chief accountants	Qualitative	Gradual improvement
	(IX) Personnel structure	44. The title structure of health technicians	Quantitative	Monitoring for comparison
Continuous development		45. The proportions of anesthesiologists, pediatricians, intensive care specialists, pathologists and TCM practitioners▲	Quantitative	Gradual improvement↑
		46. Doctor-nurse ratio▲	Quantitative	Monitoring for comparison

Level 1 indicator	Level 2 indicator	Level 3 indicator (Indicator No. and name)	Indicator attribute	Indicator orientation
Satisfaction	(X) Talent training	47. Percentage of employees admitted from other hospitals (especially counterpart support hospitals and hospitals within medical consortiums) for advanced training and who have returned to their original hospitals to work independently.	Quantitative	Gradual improvement↑
		48. The pass rate of hospital residents taking the Qualification Examination for Doctors for the first time▲	Quantitative	Gradual improvement↑
	(XI) Discipline development	49. Work results of medical personnel training undertaken by the hospital	Quantitative	Gradual improvement↑
		50. Fund for scientific research projects per 100 health technicians▲	Quantitative	Gradual improvement↑
		51. Amount of scientific research results per 100 health technicians	Quantitative	Gradual improvement↑
	(XII) Credit building	52. Comprehensive public credit evaluation ratings	Qualitative	Monitoring for comparison
	(XIII) Patient satisfaction	53. Outpatient satisfaction▲	Quantitative	Gradual improvement↑
		54. Inpatient satisfaction▲	Quantitative	Gradual improvement↑
	(XIV) Medical staff satisfaction	55. Medical staff satisfaction▲	Quantitative	Gradual improvement↑

Source: General Office of China's State Council (2019)

2.4.2 Performance appraisal purposes

The implementation of the "National Appraisal" in tertiary public hospitals is a pioneering work in China's new healthcare reform. It has drawn great attention from health authorities and hospital managers across the country and has provided a useful management tool for hospital performance management. "What gets measured gets attention, particularly when rewards are tied to the measures" (Eccles, 1991, p. 131). In other words, "What you measure is what you get" (Kaplan & Norton, 1992, p. 1). The purpose of implementing the "National Appraisal" is to guide public hospitals to achieve the following "three transformations and three improvements" (General Office of the National Health Commission of the PRC, 2019):

Transformation of hospital development model: to promote the development of tertiary public hospitals from the orientation on scale expansion to the orientation on quality and efficiency, focusing on healthcare quality improvement.

Transformation of hospital management model: from extensive administrative management to all-round performance management, focusing on improving service efficiency. Previously, many hospitals used the distribution model based on the balance of income and expenditure to encourage departments to generate income, resulting in over-diagnosis and overtreatment, repeated examinations, over-prescription for commissions, and other profit-seeking behaviors. Healthcare resources were seriously wasted. At present, the public hospital reform has entered the crucial stage, where the mode of hospital management needs to be changed, and the management of hospitals needs to be more refined.

Transformation in the direction of hospital investment: hospitals transform from vigorously investing in hardware and facilities to strengthening the income distribution management of employees and focusing on improving the salary package of medical professionals. The scientific and reasonable distribution of income can motivate and mobilize the initiative of employees.

2.4.3 Performance appraisal indicators

Public hospitals are non-profit organizations that cannot regard pursuit of economic benefits as their main purpose. Their performance results are influenced by multiple stakeholders, which determines the complexity and multidimensionality of performance appraisal of public hospitals. An organization's performance appraisal system needs to fully consider and meet the needs of its key stakeholders as much as possible in order to maximize the value of the appraisal (Suo, 2012). Therefore, performance appraisal of public hospitals needs to balance multiple stakeholders to reflect the efficiency of hospital operations and the quality of healthcare services more scientifically and accurately.

In the "National Appraisal", healthcare quality is a key dimension receiving keen attention from the state. It is measured by 24 indicators, accounting for 43.6% of all the indicators; operational efficiency reflects the level of lean management of public hospitals and is measured by 19 indicators, accounting for 34.5% of all the indicators; sustainable development mainly assesses the building of talent teams as well as teaching and research capacity in public hospitals and encompasses nine indicators, accounting for 16.4% of all the indicators. Satisfaction is divided into patient satisfaction and medical staff satisfaction. Patient satisfaction is measured by three indicators covering both outpatients and inpatients, accounting for 5.5% of all the indicators. This shows that healthcare quality is the focus of the "National Appraisal". Healthcare quality, which is related to the survival and development of the hospital, is the most important criterion for evaluating performance management, and continuous healthcare quality

improvement is an important goal of hospital performance management (Tuo & Ding, 2018).

Performance appraisal is an important yardstick to test the effectiveness of healthcare reform and a complex systematic project. It is particularly important to explore and study the implementation effects of the "National Appraisal". Over the past three years since its implementation, hospital managers have mainly focused on how to improve the performance appraisal results and on the performance of certain specific indicators. Empirical studies on the implementation effects of the "National appraisal" are still very limited or even absent. Based on a review of existing literature and theories, this study uses hospitals in prefecture-level cities as cases to find out the changes brought by the implementation of the "National appraisal" to the key stakeholders of hospitals and the concurrent challenges through an analysis of quantitative data and the data collected from semi-structured interviews with key stakeholders of the sample hospitals. It also explores whether the hospitals aligned the "National Appraisal" indicators with their own strategic goals and the main drivers of successful implementation of the "National appraisal".

In this context, this study conducts an exploratory study on the effective implementation of the "National appraisal" to answer the following research questions:

RQ3: What benefits and positive changes has the implementation of the "National Appraisal" brought to the key stakeholders?

RQ4: What are the challenges faced by tertiary public hospitals at the prefecture level in the implementation of the "National Appraisal"? What key appraisal indicators need to be added and improved?

RQ5: What is the status of implementation of the "National Appraisal" in tertiary public hospitals?

RQ5.1: How should the "National Appraisal" indicators be aligned with hospitals' organizational strategy and be implemented?

RQ5.2: What are the main drivers of successful implementation of the "National Appraisal"?

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Chapter 3: Research Methods

This chapter describes the research methods used in this study, including expert consultation using the Delphi method, quantitative analysis of annual performance appraisal data and the semi-structured interviews with key stakeholders in the three sample hospitals, elaborates on the research process, and discusses the reliability and validity of the study.

3.1 Research methods overview

A mixed methods research design combining qualitative and quantitative approaches can complement each other well, and qualitative case studies can compensate for the limitations of quantitative research (Tashakkori et al., 1998). To increase the research validity, this study adopts a mixed methods design combining the following qualitative and quantitative methods:

(1) The Delphi method

The Delphi method is primarily used to gather and distill expert opinions and to obtain group consensus on a given subject (Dalkey & Helmer, 1963). It is a relatively straightforward and flexible method of gathering information by structuring a group communication process to facilitate problem solving and model building (Linstone & Turoff, 1975). It is an iterative process in which a series of questions of concern, solutions, and predictions are made into separate questionnaires sent to designated experts. Each time a subsequent questionnaire is prepared based on the results of the previous one until a consensus is reached and the research questions answered. The first and second research questions of this study were answered using the Delphi method. Specific stakeholders in tertiary public hospitals were defined based on a review of the existing literature. After that, relevant experts were invited to complete the questionnaire. The results were summarized and analyzed to produce round one results. In round two questionnaire , experts were invited to select the appraisal indicators most relevant to the key stakeholders with reference to round one results. Then, they were asked to categorize the "National Appraisal" indicators into the four dimensions of the balanced scorecard for analysis. Results of the two rounds of expert consultations were then analyzed and summarized.

(2) Quantitative analysis of performance appraisal data of three hospitals

This study selected tertiary public hospitals located in different prefecture-level cities as sample hospitals based on the principle of convenience sampling. The "National Appraisal" data of the three sample hospitals over the 2018-2020 timespan were used for comparative analysis, which revealed the trends of change in the indicators of different dimensions of the sample hospitals from the balanced scorecard perspective. On this basis, the implementation effects of the "National Appraisal" in different prefecture-level cities were identified to shed light on the essence of things and law of development.

(3) Semi-structured interviews

This study used semi-structured interviews known for flexibility with a rough outline to directly lead to topics or themes closely related to the research questions. They also allow the interviewees' ideas to be heard and require the development of an interview protocol and recording of the interview questions (Rabionet, 2011). In this study, the researcher designed a semi-structured interview outline based on a quantitative analysis of the key indicators of the "National Appraisal" of the sample hospitals over the 2018-2020 timespan and conducted face-to-face interviews with key stakeholders of the sample hospitals. Then the interview data were analyzed to identify the benefits and positive changes brought by the implementation of the "National Appraisal" in the hospitals and the concurrent challenges as well as to explore the main drivers of successful implementation and how different hospitals align their organizational strategies with the "National Appraisal". On this basis, exploratory answers to RQ3, RQ4, and RQ5 were provided.

3.2 Research process

Research process design refers to a logical sequence of empirical data to link the research questions with the final conclusions, which is a logical model of empirical evidence and a key link to ensure the smooth progress of the study (Yin, 2009). This study follows the empirical research design process consisting of four stages, namely, the first round of Delphi expert consultations, the second round of Delphi expert consultations, a quantitative analysis of the "National Appraisal" data of the sample hospitals, and semi-structured interviews with key stakeholders of the sample hospitals. The research flowchart is shown in Figure 3.1.

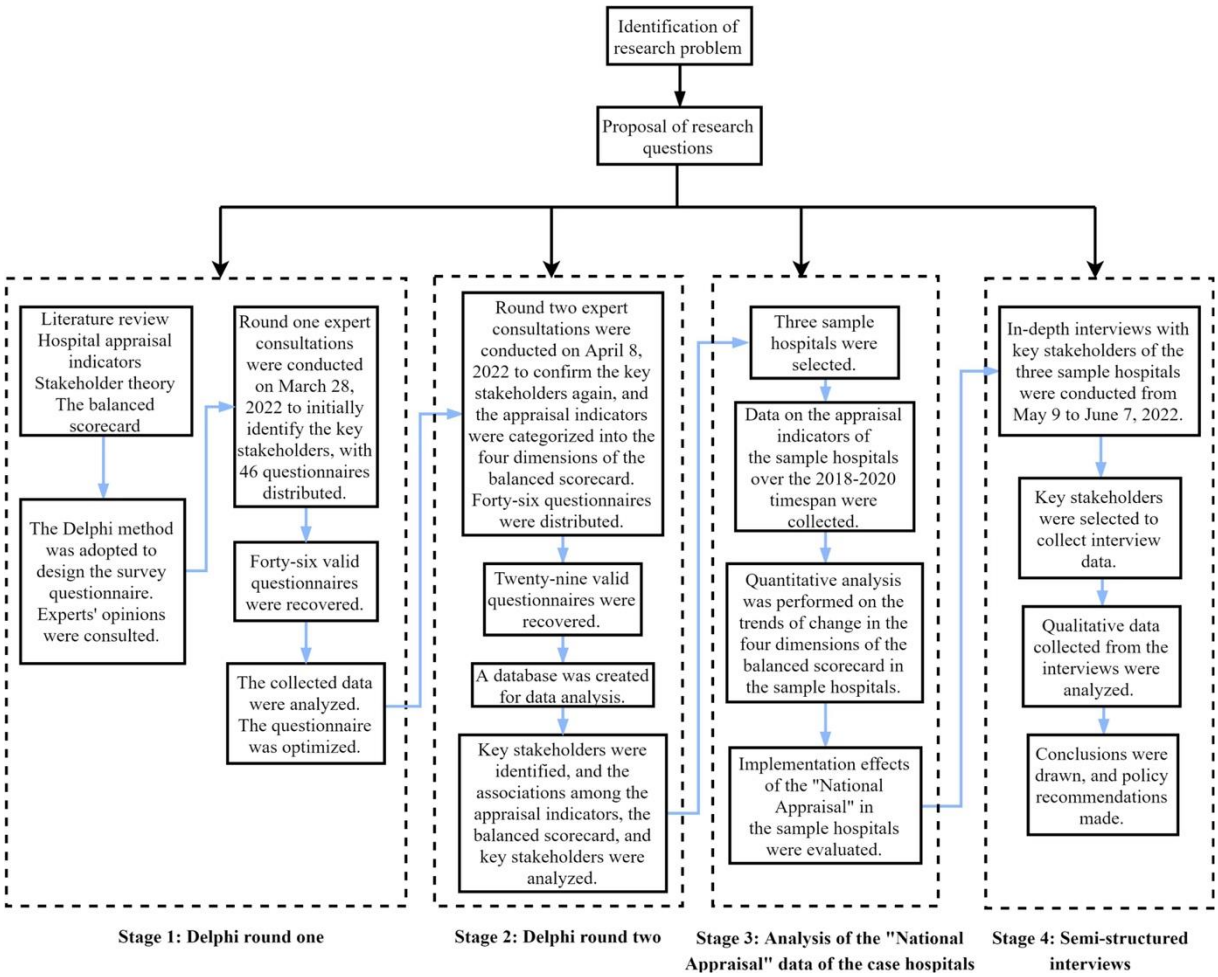


Figure 3.1 Research flowchart

This study is an empirical study based on a mixed methods design combining quantitative and qualitative research methods. From the quantitative perspective, archival data on key appraisal indicators of the three sample hospitals over the 2018-2020 timespan were collected and analyzed, and descriptive statistics were conducted to compare and analyze the trends of change in key appraisal indicators. From the qualitative perspective, the Delphi method was adopted to identify the key stakeholders of public hospitals, and interviews with key stakeholders of the sample hospitals were conducted to obtain first-hand data to explore the implementation effects of the "National Appraisal" and concurrent challenges and to identify the key drivers of its successful implementation for the purpose of facilitating the implementation of the national performance appraisal policies. The structure of the study is featured by "proposal of research questions – literature review - convenience sampling (identification of the sample hospitals) – data collection - quantitative data analysis – design of interview outline – analysis of qualitative interview data - theory construction – proposal of conclusions and recommendations.

3.3 The Delphi method

3.3.1 The expert panel for the Delphi method round one

The first round of expert consultations was conducted using a convenience sampling method, and 46 experts from the fields of hospital management and clinical medicine in ten provinces and cities across China were selected from February 2022 to March 2022. The entry criteria of the experts are: (1) more than ten years of experience in clinical medicine, hospital management and other relevant fields; (2) senior professional titles; (3) experience in department or division management; and (4) willingness to participate in this study. The demographic characteristics of the experts are shown in Table 3.1.

Table 3.1 Demographic characteristics of the experts consulted

Variable	Number (N)/Mean	Percentage (%)/Standard Deviation (SD)
Age	52.15	6.53
Years of service in the current position	18.02	12.93
Post		
Vice presidents and above	30	65.2%
Functional department leaders	13	28.3%
Association leaders	3	6.5%
Educational background		
Doctoral degree holders	10	21.7%
Master's degree holders	22	47.8%
Holders of a bachelor's degree or below	14	30.4%
Department		
Clinical departments	27	58.7%
Management departments	19	41.3%
Total	46	100%

3.3.2 Questionnaire for the Delphi method round one

The first round of expert consultations identified nine potential key stakeholders that appeared most frequently in the existing literature based on a prior literature review: health authorities, hospital managers, patients and their families, hospital employees, competitors, suppliers, industry associations, the public, and the media. Accordingly, this study designed a questionnaire to consult the key stakeholders of tertiary hospitals perceived by experts and assigned scores to the expert agreement obtained for each stakeholder: Strongly agree (6 points), agree (5 points), somewhat agree (4 points), somewhat disagree (3 points), disagree (2 points), and strongly disagree (1 point). The key stakeholders of public hospitals were identified by assessing the degree of consistency of expert opinions. The questionnaire is given in Annex A.

3.3.3 The expert panel for the Delphi method round two

In the second round, a total of 32 hospital management experts with relatively richer management experience (vice presidents or above or association leaders) were selected from the expert panel for Delphi round one and consulted again.

3.3.4 Questionnaire for the Delphi method round two

Feedback from round one expert consultations was summarized; the relevant contents were accurately described; and the relevance of the 31 key indicators of the "National Appraisal" to the key stakeholders and the four dimensions of the balanced scorecard was added to round two questionnaire for scoring according to the research questions. First, round two experts scored the key stakeholders of tertiary public hospitals according to their degree of recognition; second, a total of 31 key performance appraisal indicators consisting of 26 national key monitoring indicators and five important indicators were selected, and experts were invited to evaluate the relevance of these indicators to the key stakeholders.

The specific steps are as follows: experts were invited to select from the 31 key performance appraisal indicators the ones they considered highly relevant to the stakeholders one by one and assign a score to the degree of relevance: Relevant (1 point), quite relevant (2 points), and highly relevant (3 points). Finally, experts were invited to categorize the 31 key performance appraisal indicators into the four dimensions of the balanced scorecard one by one. The questionnaire is shown in Annex B.

3.3.5 Data analysis

The Kendall's coefficient of concordance (Kendall's W) was used in both rounds of expert consultations to assess the consistency of experts' opinions on key stakeholders. This analysis was developed by Kendall and Babington-Smith (1939) and is often used in practical applications to evaluate the consistency of ratings of multiple indicators by different evaluators. In the healthcare sector, Kendall's W is widely used in the evaluation of scale reliability and the evaluation of consistency of experts' opinions using the Delphi method. In general, if the p-value of the statistical test corresponding to the Kendall's W is less than 0.05, the consistency coefficient is considered statistically significant. In other words, there is consensus in experts' opinions. With reference to the existing literature related to the Delphi method, expert consistency can be considered good if the coefficient reaches about 0.3. The Kendall's W was

calculated using the nonparametric test module of SPSS Statistics 26.0.

The experts' commitment was evaluated through the effective recovery rate of the questionnaires. The degree of expert authority was assessed through experts' self-assessed familiarity with the performance appraisal indicators, and the experts' familiarity was divided into six levels and assigned scores: very familiar (6 points), quite familiar (5 points), familiar (4 points), quite unfamiliar (3 points), unfamiliar (2 points), and not familiar at all (1 point). The average familiarity scores of experts were converted into a 10-point scale, i.e., the average score was divided by six and then multiplied by ten to obtain the expert authority coefficient, which is usually considered by scholars to be no smaller than 7 to indicate a relatively high degree of authority of the experts included.

In round two expert consultations, the degree of relevance between each key performance appraisal indicator and the interests of key stakeholders was assessed by calculating the scores assigned to each appraisal indicator by key stakeholders. Meanwhile, each appraisal indicator had a certain number of expert endorsements under each of the four dimensions of the balanced scorecard into which the key performance appraisal indicators were categorized by the experts. The dimension with the highest number of endorsements was confirmed as the balanced scorecard dimension to which the appraisal indicator should belong. On this basis, the key indicators of the "National Appraisal" were analyzed from the balanced scorecard perspective to identify potential limitations.

3.4 Implementation outcome of the "National Appraisal" in the sample hospitals

3.4.1 Selection of the sample hospitals

According to the *2021 China Health Statistics Yearbook*, China had 2,588 public tertiary hospitals at the end of 2020 (National Health Commission of the PRC, 2021), and different tertiary hospitals vary greatly at different levels. This study chose hospitals located in prefecture-level cities as the sample hospitals. By March 2022, China had 334 prefecture-level cities, and prefecture-level hospitals refer to those established in prefecture-level cities (including cities specifically designated in the state plan) (X. Zhuang et al., 2006). Currently, most of the hospitals in prefecture-level cities are in a helpless state identical to the "middle layer of the sandwich" squeezed between provincial hospitals boasting strong technologies and resources and county-level hospitals receiving strong state support. Even hospitals in the same

prefecture-level city are faced with competition from several hospitals at the same level. In this context, prefecture-level hospitals are faced with huge development bottlenecks (Y. Q. Zhuang, 2012). This shows that implementation of the "National Appraisal" has the most prominent impact on prefecture-level hospitals. In this sense, the prefecture-level hospitals selected in this study are representative for studying the implementation effects of the "National Appraisal".

The number and quality of sample hospitals are closely related to the research questions. If the number of sample hospitals is too small, it will be impossible to cross-validate the data; if the number is too big, the data will be lengthy, rendering the study too demanding of time and human resources. Considering the researcher's own available resources, time, and convenience, three hospitals that had good working relationships with the researcher's employer were selected as the sample hospitals. A good cooperation history allowed the researcher to interact well and smoothly with the key stakeholders of the sample hospitals during collection of archival data and qualitative interviews, which was conducive to ensuring the authenticity and reliability of the research data. Three tertiary public hospitals located in prefecture-level cities were selected. The background information of the sample hospitals is provided in Annex C.

The researcher herself was working at a hospital management research center while she was studying in the Doctor of Management in Healthcare program. She maintained close relationships with the managers of several hospitals, which provided an adequate source of data for this study. Through her connections with different hospital managers, she was able to directly contact the relevant hospital departments of the three sample hospitals to provide data on the performance appraisal indicators over the 2018-2020 timespan. As hospitals are required to report the performance data on relevant indicators to the health authorities every year, the quality of the obtained data is high. This study collected data on 31 key indicators of the "National Appraisal", including 26 national key monitoring indicators. See Annex B for details.

3.4.2 Data analysis

In January 2019, the Chinese government initiated the "National Appraisal", a unified performance appraisal system across the country, and required all tertiary public hospitals to complete the analysis and evaluation of the performance of hospitals in the previous year by the end of September 2019 according to the national performance appraisal index system. Therefore, the first year' national appraisal data was in fact the data of 2018, and the annual assessment since then is based on the data of the previous year. In order to trace the implementation effect of the national appraisal since its implementation and the changes of the hospital performance measured by the National Appraisal index, this study targeted and

analyzed the 2018-2020 national examination data of three hospitals. According to the results of the two rounds of Delphi expert consultations, the dimensions reflected by the performance appraisal indicators were divided by combining the balanced scorecard and key stakeholders. Bar charts were generated in Excel to analyze the trends of change of the performance appraisal indicators under different dimensions between 2018 and 2020 to provide data support for the design of semi-structured interview outline and achieve cross-validation between quantitative and qualitative analysis, thereby forming a chain of evidence from multiple sources.

3.5 Semi-structured interviews with key stakeholders of sample hospitals

3.5.1 Interviewees

Based on the preliminary Delphi expert consultations, an interview outline was designed to address the potential problems on key performance appraisal indicators reflecting the interests of key stakeholders in tertiary public hospitals, and semi-structured interviews were conducted with representative stakeholders selected from the key stakeholders of the three sample hospitals mentioned above to obtain qualitative data. There are many factors affecting performance appraisal results, and changes in specific indicators cannot be made without the active participation of stakeholders. This study combined relevant research on the definition and classification of stakeholders in public hospitals by domestic and foreign researchers, and selected representatives of key stakeholders in the sample hospitals to conduct qualitative interviews. The total number of interviewees in the three hospitals was 41, and the details are shown in Table 3.2.

Table 3.2 Demographic characteristics of the interviewees and interview data

Interviewee (ID)	Stakeholder	Specialty/ Department	Education background	Years of service in the current position	Date of interview	Length of interview
CZ Hospital						
Ca1	Hospital manager	Clinical medicine	Doctoral degree holder	3	June 1, 2022	49m 50s
Ca2	Hospital manager	Pharmacy	Bachelor's degree holder	2	June 1, 2022	52m 56s
Ca3	Hospital manager	Clinical medicine	Doctoral degree holder	2	June 1, 2022	37m 45s
Ca4	Hospital manager	Clinical medicine	Doctoral degree holder	3	June 1, 2022	24m 15s
Ca5	Hospital manager	Clinical medicine	Master's degree holder	6	June 1, 2022	61m 59s
Ca6	Hospital manager	Clinical medicine	Doctoral degree holder	1	June 1, 2022	61m 60s
Ca7	Hospital manager	Computer	Bachelor's degree holder	11	June 1, 2022	41m 22s
Cd1	Doctor or nurse	Clinical medicine	Master's degree holder	3	June 1, 2022	31m 48s
Cd2	Doctor or nurse	Clinical medicine	Master's degree holder	12	June 2, 2022	29m 16s
Cd3	Doctor or nurse	Clinical medicine	Master's degree holder	9	June 2, 2022	23m 19s
Cd4	Doctor or nurse	Clinical medicine	Master's degree holder	8	June 2, 2022	26m 15s
Cg1	Representative of a health authority	Deputy Director of the Health Commission	Doctoral degree holder	5	June 2, 2022	35m 46s
Cp1	Patient	Orthopedics			June 2, 2022	4m 42s
Cp2	Patient	Gastroenterology			June 2, 2022	3m 25s
Cp3	Patient	Gastrointestinal			June 2, 2022	10m 22s
Cp4	Patient	Gastrointestinal			June 2, 2022	9m 58s
GZ Hospital						
Ga1	Hospital manager	Clinical medicine	Bachelor's degree holder	2	10/5/2022	48m 26s
Ga2	Hospital manager	Clinical medicine	Master's degree holder	5	10/5/2022	49m 29s
Ga3	Hospital manager	Network engineering	Bachelor's degree holder	14	10/5/2022	31m 21s
Ga4	Hospital manager	Clinical medicine	Master's degree holder	2	10/5/2022	48m 43s
Ga5	Hospital manager	Nursing	Master's degree holder	10	11/5/2022	36m 15s
Gd1	Doctor or nurse	Clinical medicine	Bachelor's degree holder	28	10/5/2022	42m 25s
Gd2	Doctor or nurse	Sports medicine	Bachelor's degree holder	28	10/5/2022	35m 04s
Gg1	Representative of a health authority	Chief of the Institutional Reform Section of the Health Commission	Doctoral degree holder	3	11/5/2022	53m 33s
Gp1	Patient	Stomatology			10/5/2022	3m 31s
Gp2	Patient	Neurology			10/5/2022	4m 19s
Gp3	Patient	Endocrinology			10/5/2022	3m 02s

Interviewee (ID)	Stakeholder	Specialty/ Department	Education background	Years of service in the current position	Date of interview	Length of interview
Gp4	Patient	General practice			11/5/2022	5m 09s
Gp5	Patient	Spine surgery			11/5/2022	4m 03s
QY Hospital						
Qa1	Hospital manager	Clinical medicine	Doctoral degree holder	1	21/5/2022	32m 06s
Qa2	Hospital manager	Clinical medicine	Bachelor's degree holder	7	20/5/2022	70m 05s
Qa3	Hospital manager	Clinical medicine	Master's degree holder	12	20/5/2022	37m 52s
Qa4	Hospital manager	Clinical medicine	Bachelor's degree holder	3	20/5/2022	29m 29s
Qd1	Doctor or nurse	Clinical medicine	Master's degree holder	22	20/5/2022	30m 18s
Qd2	Doctor or nurse	Clinical medicine	Master's degree holder	1	20/5/2022	15m 30s
Qd3	Doctor or nurse	Clinical medicine	Master's degree holder	5	21/5/2022	41m 27s
Qd4	Doctor or nurse	Clinical medicine	Master's degree holder	1	21/5/2022	35m 04s
Qp1	Patient	Nephrology			21/5/2022	5m 51s
Qp2	Patient	Cerebrovascular			21/5/2022	3m 11s
Qp3	Patient	Nephrology			21/5/2022	3m 31s
Qp4	Patient	Cerebrovascular			21/5/2022	3m

3.5.2 Interview outline

Based on the proposed research questions, an interview outline was designed prior to the interviews and gradually refined as the interviews were conducted one by one. The key common questions for all the interviews included: What positive changes has the implementation of the "National Appraisal" brought to the key stakeholders? What are the challenges faced by tertiary public hospitals at the prefecture level in the process of implementing the "National Appraisal"? From the perspective of key stakeholders, do you think the current appraisal indicators balance the interests of all parties, and what key appraisal indicators need to be supplemented and improved? How do you compare the implementation results of the "National Appraisal" across different prefecture-level hospitals? How are the "National Appraisal" indicators linked to the hospital's organizational strategy and implemented (how to use the balanced scorecard to align performance appraisal indicators with the hospital's strategic goals)? What are the key drivers of successful implementation of the "National Appraisal"? See Annex D for details.

In addition to the common questions of interest, the researcher designed specific questions for each hospital based on the characteristics of changes in the appraisal indicators among different hospitals. For example, for GZ Hospital, the questions "what are the reasons for the reduction in the number of referrals to lower-level hospitals?" and "what are the reasons for the low growth rate of medical income?" were asked; for CZ Hospital, the reasons for the difficulty in increasing the proportion of medical service revenue were explored in depth.

3.5.3 Process of interviews with key stakeholders

In order to enrich the interview contents to better answer the research questions, the author made a lot of preliminary preparation, including reviewing the literature, developing interview ideas, drafting the interview outline, discussing and revising the interview outline with her supervisor, screening the interviewees, and understanding the background of the interviewees; listening attentively to the interviewees' answers and taking notes during each interview; compiling the interview notes on the same day of the interviews; converting the recorded interview data into textual data; verifying the details with the interviewees on the next day to clarify any confusion; and collecting interviewees' views and suggestions on the "National Appraisal" according to the interview outline.

3.5.4 Interview data analysis

Qualitative interview data were analyzed using MAXQDA 2020 software. By collecting interview data from three sample hospitals, a multi-case and multi-level study was established. This study adopted open coding, which refers to the process of extracting keywords from the interview data records, conceptualizing them to form Level 1 codes, and then categorizing concepts with similar kernels to form Level 2 codes. It is a process of abbreviating a large number of data records level by level according to certain principles, using concepts and categories to correctly reflect the content of the data, and breaking down, segmenting, and re-integrating the data records to abstract concepts.

Open coding: All the interview data were imported into MAXQDA 2020 for open coding. After decomposition, there were 392 original statements, which were organized, analyzed, and interpreted. The information contained in the original statements was labeled in order, during which the original meaning of the statements was retained as much as possible. For example, in Question 1, the answer by Ga1 is "*I am directly in charge of the quality management office, which supervises the corresponding departments to collect data. Normally, we will analyze the data of the 'National Appraisal' and rectify the ones with poor quality. I regularly participate in the analysis and report of the 'National Appraisal' data.*" The main information was extracted by labeling, and the Level 1 codes are "head of functional department" and "data trend analysis and feedback". These two labels are independent of each other and can reflect the gist of the original text. All interview data were coded 1,194 times, and 554 Level 1 codes were obtained, including 322 related to hospital managers, 157 related to clinicians, 44 related to representatives of health authorities, and 31 related to representative patients (see Table 3.3 for details). Subsequently, based on the Level 1 codes under each question, Level 2 coding was conducted to analyze and discuss the implementation status of the "National Appraisal" and the challenges therein.

Table 3.3 Open coding I of qualitative interview data

Original statements	Labels
Question 1: What are your role and tasks in the implementation of the "National Appraisal"?	
The quality control department is responsible for collecting and controlling the quality of data and interpreting the indicators. Firstly, the indicator data collection schedule is formulated according to the definitions of indicators; the sources of data are determined; division of labor is made regarding the data collection, and the responsible persons are identified; indicators are interpreted, training sessions carried	aa1 Data collection aa2 Data quality control aa3 Indicator interpretation aa4 Assignment of indicators to the responsible persons aa5 Facilitation of the implementation of the "National

Original statements	Labels
out, guidance on data collection provided, and the hospital internal data collection operation manual compiled. On this basis, the appraisal data are analyzed and feedback given. (Ga5) *I am directly in charge of the quality management office, which supervises the corresponding departments to collect data. Normally, we will analyze the data of the "National Appraisal" and rectify the ones with poor quality. I regularly participate in the analysis and report of the "National Appraisal" data. (Ga1)* …	Appraisal" indicators aa6 Data trend analysis and feedback aa7 Head of functional department
Question 2: How does your hospital implement the "National Appraisal" and advance its implementation? *The "National Appraisal" indicators are decomposed to each department and linked to the performance bonuses of clinicians as well as to the year-end rating and merit evaluation of each department. These indicators are related to department directors' ratings, merit evaluation and post allowances. The amount of year-end bonus is determined according to the scores of each indicator. For some of the important indicators, individual awards will be presented departments and individuals that have done a good job. Departments are assessed on a monthly and yearly basis.* *If data analysis results suggest that the department indicators have deviated from the requirements for "National Appraisal", the department will be required to identify reasons and make rectifications. (*Ga1) *Clinicians are engaged through the comprehensive objective management assessment by the hospital's clinical department, medical laboratory and related functional departments. The indicators of the "National Appraisal" are included into the assessment and scoring system of clinicians for monthly and annual assessment, which directly affects the performance bonuses of departments and individuals. (Ga5)* …	aa8 Decomposition of indicators to relevant departments aa9 Linkage with performance bonuses aa10 Awards to excellent employees aa11 Real-time appraisal feedback aa12 Real-time monitoring aa13 Assignment of indicators to functional departments by the Appraisal Office
Question 3: How does your hospital collect data on the implementation of the "National Appraisal"? *The indicators are decomposed to each relevant department according to their daily work functions. For each indicator, one person is responsible for data collection, and the other is responsible for quality control. A dedicated person is responsible for collecting, monitoring and improving the data on each indicator. (Ga5)* *The data of each month are checked and reported to the higher authority, and modifications are made according to the requirements of the "National Appraisal". These are daily tasks and are performed every month regardless of the "National Appraisal". (Qa4)* …	aa14 Submission of data by clinical departments aa15 Collection of data by clinical departments from assignment of the functional departments aa16 Collection of data by the responsible persons of indicators aa17 Decomposition to functional departments by the Quality Management Office
Question 4: What positive changes has the implementation of the "National Appraisal" brought to your hospital? *(1) The "National Appraisal" functions as a baton. Take the surgery system for example. Inpatients are admitted on a selective basis, which means that not all patients can be*	aa18 Baton role aa19 Advocation of difficult surgeries

Original statements	Labels
admitted into the hospital. The "National Appraisal" emphasizes the proportion of discharged patients who underwent a Level 4 surgery and the proportion of discharged patients who underwent a minimally invasive surgery. To increase these proportions, physicians cannot admit patients who do not have surgical indications or who do not need to be hospitalized but can either be treated directly in the outpatient department or be placed in day surgery. Previously, patients were just admitted into the hospital for inpatient care. This change also motivates doctors to really focus on treating intractable and severe diseases and can give full play to the professionalism of tertiary public hospitals. Our strategic goal remains to be a regional center committed to treating intractable diseases and developing new technologies. We have also done some calculations. For inpatients with minor diseases who do need to undergo a surgery or only need to undergo a minor surgery, our hospital ends up losing money treating them according to the current medical insurance scheme. This is because now there are no price markups on drugs and consumables, but they both entail costs. (2) The "National Appraisal" indicators can guide hospitals to carry out structural adjustment in such aspects as the proportions of beds in the internal medicine department and the surgery department. Although there is an impact on the admission of patients in the early days, it will lead to empty beds in some departments and low bed utilization rate. Now the bed utilization rate in some departments is only between 80% and 90%. We have to undergo a painful process. Now the proportion of surgical beds has been higher than the proportion of beds in the internal medicine department. (Qa1) *(1) Our hospital's internal targets for the "National Appraisal" indicators are set based on the internal development of the hospital to truly reflect the status of the hospital.* *(2) Our hospital plans to integrate the "National Appraisal" indicators into our internal management information system to enable our hospital's information system to monitor these indicators.* *(3) We now use the "National Appraisal" data as an effective management means to guide our hospital to make progress. (Ca7)* …	aa20 Strict implementation in accordance with the admission standards aa21 More admissions of patients in need of surgical treatment aa22 Focus on treating difficult miscellaneous diseases aa23 Performance of minor surgeries at a loss aa24 Adjustment of the proportions of beds in the internal medicine department and the surgery department aa25 Physician adoption of surgical procedures aa26 Identification of development goals aa27 Understanding of the hospital development status aa28 Improvement in information technology
Question 5: How do the health authorities advance the implementation of the "National Appraisal" in your view?	
Health authorities, as managers of the healthcare sector and policymakers, need to guide hospitals to achieve sound development and improve their capacity. They should optimize the allocation of healthcare resources, integrate resources, optimize the industry landscape, and guide local hospitals to achieve complementary development by setting requirements on the entry criteria for specialties. (Ga2) *Professionals should be allowed to do professional work. Every hospital leader wants to manage the hospital well and give it more autonomy. Many government officials have not*	aa29 Guiding role on hospital development aa30 Complementary development of hospitals achieved through entry criteria for specialties aa31 More consultations on the opinions of clinical professionals aa32 More consideration of the reality of hospitals while

Original statements	Labels
worked in hospitals and are encouraged to consult the professional advice of professionals while formulating policies. At present, hospitals are struggling to survive due to insufficient investment from the government department and increasing personnel expenditure in aspects including salaries and training & learning as well as high labor cost. The personnel expenditure has taken up as much as 36% of the total expenditure. Our hospital has 3,152 employees. In the peak period, 22% of the employees were involved in the fight against the COVID-19 pandemic. The medical insurance department does not have a corresponding medical insurance policy to encourage patients to seek treatment in local hospitals. There is only a 5% difference in the reimbursement rate between patients going directly to a large provincial hospital and being referred by a local hospital to a higher-level hospital. This rate does not make a difference for ordinary people. Consequently, areas with a developed transportation network are bound to lose patients. In fact, many patients could not get out of the city during the COVID-19 pandemic. We solved their problems as well. Therefore, I hope that relevant health authorities can introduce more favorable policies and provide more financial support for hospitals. (Ca5)	formulating policies aa33 The need to provide financial support for hospitals aa34 Hindered sustainable development due to a high proportion of personnel expenditure aa35 The need to formulate medical insurance policies to retain patients. aa36 Lowered restrictions on financial indicators
…	
Question 6: Do you think it necessary to further improve the "National Appraisal" indicator system? *Improvements are needed: Differentiated appraisal of tertiary hospitals in China by classification and the administrative division levels of their locations should be carried out. A single set of criteria cannot be used to measure hospitals at different levels. Instead, less weight should be assigned to indicators on research output for prefecture-level hospitals while more weight should be assigned to indicators on clinical competence. There is also a need to reduce the required number of published research articles to improve the performance of clinicians.* (Ga1) *(1) It is unreasonable to use a single set of indicators to assess all tertiary hospitals. It is recommended that the appraisal should be differentiated by classification and the administrative division levels of their locations, and the demographic factors of the city be factored in. Now many hospitals are losing money. But when hospitals struggle to sustain normal operation and the government does not invest much, hospitals need to survive and retain talents before thinking about serving public interests.* *(1) Scientific research indicators should also be treated on a differentiated basis. For example, the weight of scientific research indicators can be greater for university-affiliated hospitals as well as hospitals under the provincial health commissions and the Ministry of Health, while the corresponding weight for prefecture-level urban hospitals need to be adjusted because they need to focus more on developing clinical services.* (Ca4)	aa37 Differentiated appraisal of hospitals by classification and the administrative division levels of their locations aa38 Great emphasis attached to clinical practice by prefecture-level hospitals aa39 Less weight to scientific research indicators aa40 Differentiated appraisal of hospitals by the size of local population aa41 Increased input from the government aa42 Weak scientific research
…	…

Original statements	Labels
In total there are 392 original sentences (219 by hospital managers, 138 by representative clinicians, 22 by representatives of health authorities, and 13 by representative patients)	A total of 554 labels (322 for hospital managers, 157 for representative clinicians, 44 for representatives of health authorities, and 31 for representative patients)

3.6 Validity and reliability

In assessing the validity and reliability of empirical studies, this study referred to the research theories proposed by Yin (2009) and Gibbert et al. (2008). The details are presented in Table 3.4.

Table 3.4 Research strategy ensuring validity and reliability

	Research strategy	Strategy application stage	Strategy used in this study
Validity	• Perform pattern matching for key stakeholders identified to those reported by other authors in literature. • Derive balanced scorecard framework from literature; • Theory triangulation by integrating the lens of both stakeholder theory and balanced scorecard. • Use multiple sources of data, including expert opinions, interview data and archival data from three hospitals.	Research design; Data collection; Data analysis;	• The research design was developed by referring to a large body of literature. The balanced scorecard and stakeholder theory were used to initially identify the logical relationships between the factors. The results were derived by analyzing the intrinsic relationships between the results from multiple perspectives, including Delphi expert consultations, archival data on indicators of sampling hospitals and interviews with hospital stakeholders. • Multiple sources of data were collected and used. Two rounds of questionnaires were conducted to collect the expert opinions. Interviews were conducted to collect the opinions of multiple stakeholders. Then a chain of evidence from multiple sources was formed in conjunction with the archival data collected from the hospital's previous performance appraisals.
Reliability	• Provide a careful and detailed research procedures (see Figure 3.1) • Apply software to analyze data; • Form a complete chain of evidence from multiple sources of data.	Data collection	• A standardized research plan was formulated in advance and strictly implemented; • A professional qualitative analysis software was used to ensure accurate data entry and extraction; • A questionnaire was conducted among a larger number of experts in multiple fields, and Kendall's W was used to evaluate the consistency of results;

Source: Gibbert et al. (2008); Yin (2009)

This study paid continuous attention to validity and reliability throughout the whole process covering research design, data collection and data analysis using the following methods.

(1) Validity: First, in the research design, the researcher reviewed a large amount of previous literature and used the mature balanced scorecard and stakeholder theory to propose the basic framework and research questions. Next, a mixed design combining quantitative and qualitative research methods was used. Miles and Huberman (1994) argue that the idea of applying multiple sources at the same time or at different times to derive research findings can increases the normality, rigor and reliability of the study. In the quantitative questionnaire , questionnaires were administered to experts in two rounds, and feedback was provided on the results of round one survey, which was validated again in the second round; in the qualitative study, interviews were conducted with multiple stakeholders to collect the views of different roles in approaching the questions from different perspectives to corroborate each other. Meanwhile, archival data on the performance appraisal of the sample hospitals over the three-year timespan and data of interviews with the performance appraisal stakeholders were collected. The archival data and qualitative interview results corroborated each other.

(2) Reliability: First of all, a complete and scientific research protocol was developed and strictly implemented under the guidance of the supervisor. The data collection process strictly followed the four basic principles mentioned by Yin (2009): (1) using multiple sources of evidence; (2) building a research database; (3) corroborating data obtained from different sources to form an "evidence triangle"; and (4) using electronic data with prudence. In addition, to ensure the reproducibility of the research steps; this study strictly recorded the data collected from the interviews, ensured the accurate entry of the interview data, used professional qualitative analysis software, and arranged two persons to code the data to ensure that the codes could accurately reflect the meaning of the sentences and fully extract the information from the interviewees. Lastly, this study conducted a questionnaire among more than 40 experts, which was an adequate sample size. Two rounds of Delphi surveys were conducted to assess the consistency of experts' opinions using standardized statistical methods. The experts surveyed by the questionnaire and the key stakeholders interviewed in the sample hospitals all had a good basis of cooperation with the enterprise where the researcher was working so that the researcher was able to gain their trust, and all respondents had a high degree of cooperation.

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Chapter 4: Results

Based on the research methods described in Chapter 3, this chapter presents the results of the Delphi expert consultations, the analysis of "National Appraisal" data of the three sample hospitals over the 2018-2020 timespan, and the analysis of qualitative data collected from interviews with the key stakeholders of the three sample hospitals.

4.1 Results of the two-round Delphi study

4.1.1 Delphi round one

This section introduces the preliminary identification of the key stakeholders of tertiary public hospitals through the Delphi method.

4.1.1.1 Demographic characteristics of round one experts and their scores

Forty-six questionnaires were distributed in the first round of expert consultations, and 46 were recovered, representing a recovery rate of 100%. The 46 management experts surveyed were all hospital leaders or medical association leaders, with an average age of 52 years old and an average of 18 years of service in their current positions. Those with a master's degree or above took up 69.5%, and those with a clinical professional background 58.7%. See Table 4.1 for details.

The mean scores for the nine potential key stakeholders ranged from 5.43 to 3.87 points. Experts believed that the top five key stakeholders of the "National Appraisal" were hospital managers, clinicians, patients and their families, health authorities, and the public. Meanwhile, there was no statistical difference in the scores of each key stakeholder among managers of different levels and managers with different professional backgrounds., meaning their opinions were largely consistent. The details are presented in Table 4.1.

Table 4.1 Stakeholder scores assigned by experts in different positions and with different professional backgrounds

Item	Vice presidents and above, mean (SD) (N=30)	Functional department leaders, mean (SD) (N=13)	*p* value	Clinical managers, mean (SD) (N=27)	Managers, mean (SD) (N=19)	*p* value	Total mean (SD) (N=46)
Health authorities	4.80 (1.16)	5.00 (1.00)	0.617	4.93 (1.17)	4.58 (1.26)	0.344	4.78 (1.21)
Hospital managers	5.47 (0.82)	5.31 (0.63)	0.533	5.33 (0.83)	5.58 (0.61)	0.279	5.43 (0.75)
Patients and their families	5.07 (0.94)	4.46 (1.13)	0.123	5.00 (0.96)	4.63 (1.42)	0.299	4.85 (1.17)
Clinicians	5.20 (1.06)	5.15 (0.80)	0.902	5.26 (0.86)	4.89 (1.45)	0.291	5.11 (1.14)
Competitors	4.47 (0.97)	4.77 (1.09)	0.402	4.41 (0.93)	4.53 (1.39)	0.729	4.46 (1.13)
Suppliers	4.00 (1.17)	3.69 (1.44)	0.482	4.04 (0.98)	3.63 (1.64)	0.300	3.87 (1.29)
Industry associations	4.23 (1.41)	3.77 (1.74)	0.354	4.11 (1.42)	4.21 (1.62)	0.827	4.15 (1.49)
The public (social residents and the ecological environment)	4.60 (0.81)	4.46 (1.05)	0.647	4.63 (0.84)	4.47 (0.96)	0.562	4.57 (0.89)
The media	3.87 (1.17)	4.15 (1.21)	0.486	4.15 (1.13)	3.53 (1.31)	0.092	3.89 (1.23)

4.1.1.2 Round one experts and the consistency of their identification of key stakeholders

The consistency of the appraisal results was first assessed for all the 46 respondents, and the Kendall's W for all the nine indicators of the 46 questionnaires is 0.273 ($p < .001$). After removing "the media" which ranked the last, the Kendall's W of the first eight indicators is 0.263 ($p < .001$). The same process was repeated, and the Kendall's W of the first seven indicators is 0.223 ($p < .001$), the first six indicators 0.231 ($p < .001$), the first five indicators 0.222 ($p < .001$), until the Kendall's W of the first four indicators drops steeply to 0.116 ($p < .001$). Based on an overall consideration of the above results, the number of key indicators, and the value of Kendall's W, it is most reasonable to select the first five indicators as the key stakeholders, namely, hospital managers, clinicians, patients and their families, health authorities, and the public (social residents and the ecological environment).

To further test the reliability of the results considering the differences in the perceptions of key stakeholders between hospital managers above and below the level of vice president, 30 managers above the level of vice president were selected for the analysis of Kendall's W. See Annex E for the average ranking of the nine stakeholders. The results indicate that the ranking

of stakeholders is stable and consistent with the results of all the 46 respondents. Meanwhile, the Kendall's W of all the nine indicators for all the 30 respondents at the level of vice president or above was 0.331 ($p < .001$), 0.301 ($p < .001$) for the first eight indicators, 0.291 ($p < .001$) for the first seven indicators, 0.285 ($p < .001$) for the first six indicators, 0.273 ($p < .001$) for the first five indicators, and 0.154 ($p < .001$) for the first four indicators. The consistency of scores of managers above the level of vice president improved compared to all the 46 respondents. It is still the best to select the top five indicators as key stakeholders.

In the same fashion, consistency of results was assessed for 11 president-level respondents. Despite some fluctuations in the ranking of the results, ranking of the top five stakeholders remained stable. The Kendall's W of the scores assigned to the nine stakeholders by the 11 presidents reaches 0.525 ($p < .001$). The coefficient is 0.369 ($p < .001$) for the top five indicators, and 0.059 ($p < .001$) for the top four indicators ($p < .001$). The significant increase in the value of the Kendall's W compared to the previous respondents indicated that president-level managers were more consistent in their opinions on stakeholders and agreed on the first five indicators as key stakeholders.

Based on the changes in Kendall's W, the top five stakeholders by the ranking of scores were identified in the first round of questionnaire as the key stakeholders initially identified in this study, namely: hospital managers, clinicians, patients and their families, health authorities, and the public (social residents and the ecological environment). On this basis, the researcher conducted the second round of questionnaire among respondents at the vice president level and above.

4.1.2 Delphi round two results: The relevance of indicators to key stakeholders

Delphi round two results further confirmed the stakeholders of tertiary public hospitals. On that basis, respondents were asked to categorize the "National Appraisal" indicators into the four dimensions of balanced scorecard and assign scores to the degree of relevance between the key stakeholders and the key indicators of the "National Appraisal" to assess to what extent are the said key indicators scientific and comprehensive.

4.1.2.1 Demographic characteristics of round two experts and the consistency of their scores

In the second round of expert consultations, 32 questionnaires were distributed, 29 of which were recovered, representing a recovery rate of 90.6%. The experts generally rated themselves as being highly familiar with the appraisal indicators of tertiary public hospitals, with a

reliability coefficient of 9.25, indicating a high degree of reliability of the assessment results. According to the written opinions of round one experts, the researcher replaced the item "patients and their families" with "patients". The experts all agreed that the five key stakeholders are highly relevant to the "National Appraisal" indicators, and the ranking of their importance fluctuated compared with round one expert consultations. Specifically, the relevance rating of patients rose from the third place in round one to the first place in round two, followed by hospital managers, clinicians, health authorities, and the public, as shown in Annex F. Consistency evaluation was performed on the scores assigned to the five stakeholders by the experts, the mean is 3.55 for patients, 3.55 for hospital managers, 3.34 for clinicians, 2.55 for health authorities, and 2.00 for the public, with a Kendall's W of 0.317 ($p < .001$). Through two rounds of expert consultations, it can be confirmed that the key stakeholders of the performance appraisal indicators of tertiary public hospitals are: patients, hospital managers, clinicians, health authorities, and the public.

4.1.2.2 Performance appraisal indicators from balanced scorecard perspective

The balanced scorecard was introduced, and the 31 key performance indicators of the "National Appraisal" were categorized into different dimensions according to the opinions of round two experts. The dimension with the highest number of expert agreements for each appraisal indicator was the dimension considered in this study. The results showed that six indicators belonged to the financial dimension, eight indicators the customer dimension, 12 indicators the internal business process dimension, and five indicators the learning and growth dimension. In terms of the customer dimension, experts' opinions diverged considerably on the rate of increase in average medical expense per inpatient (Indicator 40), rate of increase in outpatients' medical expense per visit (Indicator 38), rate of increase in outpatients' medication expense per visit (Indicator 39), rate of increase in average medication expense per inpatient (Indicator 41), and average outpatient appointment rate (Indicator 22). Only less than 60% of the experts agreed that these indicators belong to the customer dimension and the remaining 40% argued that these indicators should be classified into the financial dimension. The same is true with the number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations) (Indicator 2) in the internal process dimension. Only 48.3% of the experts agreed with the dimension classification, while most of the remaining experts held that this indicator should be classified into the customer dimension. See Table 4.2 for details.

Table 4.2 Results of the categorization of the key indicators of the "National Appraisal" into the balanced scorecard dimensions

Item	Dimension	Number of endorsers	Percentage of endorses
35. Balance of income and expenditure▲	Financial dimension	29	100%
36. Asset-liability ratio▲	Financial dimension	29	100%
37. Medical income growth rate	Financial dimension	28	96.60%
31. Proportion of medical service revenue (excluding drugs, consumables, examination and testing revenue) to medical revenue▲	Financial dimension	26	89.70%
34. Energy consumption expenditure per ten thousand yuan of income▲	Financial dimension	26	89.70%
33. Proportion of personnel expenditure to business expenditure▲	Financial dimension	25	86.20%
53. Outpatient satisfaction▲	Customer dimension	28	96.60%
54. Inpatient satisfaction▲	Customer dimension	28	96.60%
23. Average waiting time for an outpatient visit after the appointment	Customer dimension	19	65.50%
40. Rate of increase in average medical expense per inpatient▲	Customer dimension	17	58.60%
38. Rate of increase in outpatients' medical expense per visit▲	Customer dimension	16	55.20%
39. Rate of increase in outpatients' medication expense per visit▲	Customer dimension	16	55.20%
41. Rate of increase in average medication expense per inpatient▲	Customer dimension	16	55.20%
22. Average outpatient appointment rate	Customer dimension	15	51.70%
8. Incidence of postoperative complications▲	Internal business process dimension	28	96.60%
10. Single disease quality control▲	Internal business process dimension	28	96.60%
13. The number of clinical test items that have passed the national external quality assessment▲	Internal business process dimension	28	96.60%
9. Surgical site infection rate of aseptic operations▲	Internal business process dimension	27	93.10%
14. Mortality rate of cases in the low-risk group▲	Internal business process dimension	27	93.10%
17. Defined daily dose (DDDs)▲	Internal business process dimension	27	93.10%
25. Number of inpatients per doctor per day	Internal business process dimension	24	89.70%
24. Function application level of the electronic medical record▲	Internal business process dimension	22	86.20%
4. Proportion of discharged patients who underwent a surgery▲	Internal business process dimension	24	82.80%
1. Proportion of discharged patients who underwent a Level 4 surgery▲	Internal business process dimension	24	82.80%
5. Proportion of discharged patients who underwent a minimally invasive surgery▲	Internal business process dimension	23	79.30%
2. Number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations)	Internal business process dimension	14	48.30%
50. Fund for scientific research projects per	Learning and growth	28	96.60%

Item	Dimension	Number of endorsers	Percentage of endorses
100 health technicians▲	dimension		
48. The pass rate of hospital residents taking the Qualification Examination for Doctors for the first time▲	Learning and growth dimension	27	93.10%
45. The proportions of anesthesiologists, pediatricians, intensive care specialists, pathologists and TCM practitioners▲	Learning and growth dimension	25	86.20%
46. Doctor-nurse ratio▲	Learning and growth dimension	21	72.40%
55. Medical staff satisfaction▲	Learning and growth dimension	17	58.60%

In summary, in terms of the percentage of endorsers, the experts' opinions on the financial dimension indicators are the most consistent while the opinions on the customer dimension indicators are the least consistent. The means of the endorsement percentages for the four dimensions are 93.7% for financial, 66.8% for customer, 86.5% for internal business process, and 81.38% for learning and growth. There are statistical differences in the endorsement percentage of the customer dimension compared to those of the financial and internal business process dimensions, with *p* values being .002 and .006, respectively.

The most relevant key stakeholders of each tertiary public hospital's performance appraisal indicators were also analyzed. According to the expert assessment results, the stakeholder with the highest percentage of endorsement is the most directly relevant stakeholder for that appraisal indicator. Experts' opinions were divided in the assessment of several appraisal indicators. For example, a considerable number of experts deemed such indicators as proportion of discharged patients who underwent a surgery (Indicator 4), proportion of discharged patients who underwent a Level 4 surgery (Indicator 6), and proportion of discharged patients who underwent a minimally invasive surgery (Indicator 5) to be most relevant to hospital managers or clinicians; while some experts considered such indicators as incidence of postoperative complications (Indicator 8), surgical site infection rate of aseptic operations (Indicator 9), and mortality rate of cases in the low-risk group (Indicator 14) most relevant to clinicians. See Annex G for details.

Based on the scores assigned to the relevance of each appraisal indicator to the key stakeholders by the experts, a calculation was performed to identify the most relevant stakeholders for each performance appraisal indicator. Among the 31 indicators, 15 are most relevant to hospital managers, four to clinicians, 11 to patients, one to health authorities, and zero to the public, as indicated in Table 4.3.

Table 4.3 Scores assigned by experts to the association of each item with each stakeholder

Item	Hospital managers		Clinicians		Patients		Health authorities		The public		Most relevant stakeholders
	Total score	Mean score	Total score	Mean score	Total score	Mean score	Total score	Mean score	Total score	Mean score	
4. Proportion of discharged patients who underwent a surgery▲	34	2.62	32	2.67	5	1.67	2	2	0	0	Hospital managers
6. Proportion of discharged patients who underwent a Level 4 surgery▲	37	2.53	31	2.82	5	1.67	0	0	0	0	Hospital managers
10. Single disease quality control▲	27	2.33	24	2.67	20	2.86	2	2	0	0	Hospital managers
13. The number of clinical test items that have passed the national external quality assessment▲	45	2.5	6	2.33	15	2.5	2	2	3	3	Hospital managers
17. Defined daily dose (DDDs)▲	33	2.83	17	2.57	18	2.25	0	0	5	2.5	Hospital managers
24. Function application level of the electronic medical record▲	48	2.72	15	2.5	6	3	6	2	0	0	Hospital managers
31. Proportion of medical service revenue (excluding drugs, consumables, examination and testing revenue) to medical revenue▲	58	2.68	16	2.67	0	0	2	2	0	0	Hospital managers
33. Proportion of personnel expenditure to business expenditure▲	42	2.8	31	2.82	3	3	6	3	0	0	Hospital managers
34. Energy consumption expenditure per ten thousand yuan of income▲	64	2.67	3	3	3	3	2	2	3	1.5	Hospital managers
35. Balance of income and expenditure▲	63	2.63	4	2	3	3	4	2	0	0	Hospital managers
36. Asset-liability ratio▲	58	2.68	0	0	3	3	13	2.33	0	0	Hospital managers
37. Medical income growth rate	46	2.56	11	2.2	11	2.75	3	1.5	0	0	Hospital managers
45. The proportions of anesthesiologists, pediatricians, intensive care specialists, pathologists and TCM practitioners▲	27	2.33	26	2.17	4	2	6	2	0	0	Hospital managers
46. Doctor-nurse ratio▲	40	2.56	24	2.4	4	2	2	2	0	0	Hospital

Item	Hospital managers		Clinicians		Patients		Health authorities		The public		Most relevant stakeholders
	Total score	Mean score	Total score	Mean score	Total score	Mean score	Total score	Mean score	Total score	Mean score	
50. Fund for scientific research projects per 100 health technicians▲	42	2.63	21	2.63	0	0	3	1.33	2	1	managers Hospital managers
5. Proportion of discharged patients who underwent a minimally invasive surgery▲	28	2.55	30	2.58	13	2.17	0	0	0	0	Clinicians
25. Number of inpatients per doctor per day	18	2.71	58	2.68	0	0	0	0	0	0	Clinicians
48. The pass rate of hospital residents taking the Qualification Examination for Doctors for the first time▲	21	2.1	37	2.47	0	0	4	2	1	1	Clinicians
55. Medical staff satisfaction▲	11	2.75	69	2.88	0	0	3	3	0	0	Clinicians
8. Incidence of postoperative complications▲	16	2.83	26	2.6	37	2.92	0	0	0	0	Patients
9. Surgical site infection rate of aseptic operations▲	16	2.83	26	2.45	33	2.83	0	0	0	0	Patients
14. Mortality rate of cases in the low-risk group▲	17	2.57	29	2.64	32	2.91	0	0	0	0	Patients
22. Average outpatient appointment rate	19	2.38	0	0	49	2.63	0	0	5	2.5	Patients
23. Average waiting time for an outpatient visit after the appointment	17	2.57	0	0	55	2.75	0	0	5	2.5	Patients
38. Rate of increase in outpatients' medical expense per visit▲	17	2.57	6	2	48	2.67	2	2	0	0	Patients
39. Rate of increase in outpatients' medication expense per visit▲	13	2.33	9	2.25	48	2.67	2	2	0	0	Patients
40. Rate of increase in average medical expense per inpatient▲	14	2.8	8	2.67	46	2.61	6	2.33	0	0	Patients
41. Rate of increase in average medication expense per inpatient▲	14	2.8	10	2.5	45	2.65	6	2.33	0	0	Patients
53. Outpatient satisfaction▲	3	3	6	2.33	62	2.86	3	3	6	3	Patients
54. Inpatient satisfaction▲	3	3	17	2.57	52	2.89	3	3	6	3	Patients
2. Number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations)	6	2	10	2.5	26	2.36	29	2.64	0	0	Health authorities

The results in Sections 4.1.1 and 4.1.2 provide answers to RQ1 *(Who are the key stakeholders of tertiary public hospitals? To what extent are the "National Appraisal" indicators related to these key stakeholders? Are the demands of the key stakeholders balanced and taken into due account?):* This study identifies five key stakeholders of tertiary public hospitals, namely, hospital managers, clinicians, patients, health authorities, and the public. Among them, four key stakeholders are closely related to the performance appraisal indicators of tertiary public hospitals: hospital managers, clinicians, patients, and health authorities. Among the 31 key appraisal indicators, 15 are most relevant to the interests of hospital managers, taking up the largest percentage (48.4%); 11 indicators are most relevant to the interests of patients, taking up the second largest percentage (35.5%); four indicators are most relevant to the interests of clinicians, accounting for 12.9%; only one indicator is most relevant to the interests of health authorities, accounting for 3.2%; no indicator is relevant to the public.

Based on some of the results in Section 4.1.2, RQ2 *(How should the key indicators of the "National Appraisal" be categorized into the four dimensions of the balanced scorecard?)* can be answered. Specifically, the financial dimension is composed of six indicators, all of which are most relevant to the interests of hospital managers; the customer dimension consists of eight indicators, all of which are most related to the interests of patients; the internal business process dimension encompasses 12 indicators, of which six are most relevant to hospital managers, two to clinicians, three to patients, and one is to health authorities; and the learning and growth dimension is measured by five indicators, of which three are most relevant to hospital managers, and two to clinicians.

4.2 Implementation outcome of the "National Appraisal" in the sample hospitals

The data measured by the key indicators of the "National Appraisal" most relevant to various key stakeholders of the sample hospitals in the past three years since its implementation were analyzed from the perspectives of different stakeholders.

Seen from the balanced scorecard dimensions each key indicator of the "National Appraisal" is categorized into, the most relevant indicators for hospital managers include all six financial dimension indicators and half of the internal business process indicators; the most relevant indicators for clinicians include two indicators of the internal business process dimension and two indicators of the learning and growth dimension; the most relevant indicators for patients include all eight indicators under the customer dimension and three indicators under the internal

business process dimension; and one indicator under the internal business process dimension is the most relevant to health authorities. As indicated in Table 4.4, appraisal indicators are mainly focused on the interests of hospital managers and patients, with fewer indicators most relevant to clinicians as well as health authorities, and zero indicator most relevant to the interests of the public.

Table 4.4 Distribution of the key indicators of the "National Appraisal" among key stakeholders and the balanced scorecard dimensions

Dimension	Hospital managers N (%)	Clinicians N (%)	Patients N (%)	Health authorities N (%)	Total
Financial	6 [31, 33, 34, 35, 36, 37] (100)	0	0	0	6 (19.3)
Customer	0	0	8 [22, 23, 38, 39, 40, 41, 53, 54] (100)	0	8 (25.8)
Internal business process	6 [4, 6, 10, 13, 17, 24] (50)	2 [5, 25] (16.6)	3 [8, 9, 14] (25)	1 [2] (8.3)	12 (38.7)
Learning and growth	3 [45, 46, 50] (60)	2 [48, 55] (40)	0	0	5 (16.1)
Total	15 (48.4)	4 (12.9)	11 (35.5)	1 (3.2)	31 (100)

Note: N indicates the number of indicators in the respective dimension; the numbers within the square brackets ([]) indicate the numbers of the specific appraisal indicators under the respective dimensions.

4.2.1 Trends of change in the appraisal indicators most relevant to hospital managers

The number of indicators most relevant to hospital managers among the 31 key indicators of the "National Appraisal" is the largest, namely 15 indicators consisting of six indicators of the financial dimension, six from the internal business process dimension and three under the learning and growth dimension. So, what changes have occurred over the 2018-2020 timespan in these indicators most relevant to hospital managers at the sample hospitals?

In the financial dimension, all hospital indicators exhibited a trend of positive development. Among them, Indicator 31 (proportion of medical service revenue (excluding drugs, consumables, examination and testing revenue) to medical revenue), Indicator 33 (proportion of personnel expenditure to business expenditure), Indicator 34 (energy consumption expenditure per ten thousand yuan of income) and Indicator 35 (balance of income and expenditure) of CZ Hospital were all at normal levels and did not change much; Indicator 37 (medical income growth rate), which was high in the first two years, dropped to -8.41% in 2020; Indicator 36 (asset-liability ratio) was significantly high, remaining at around 70%, much higher than 47% recommended by the state authority (see Figure 4.1).



Figure 4.1 Trends of change in the key indicators of the "National Appraisal" for managers of CZ Hospital from 2018 to 2020

Note: The indicators in the red square brackets are financial indicators; those in the yellow square brackets are internal business process indicators; and those in the black square brackets are learning and growth indicators.

As to GZ Hospital, during the period from 2018 to 2020, Indicator 31 (proportion of medical service revenue (excluding drugs, consumables, examination and testing revenue) to medical revenue), Indicator 35 (balance of income and expenditure), and Indicator 37 (medical income growth rate) ranged from significantly higher than the national reference values to significantly improved to close to the national reference values (31-26.15, 35-0, 37-none, respectively); Indicator 33 (proportion of personnel expenditure to business expenditure) increased from below the national reference value to slightly above the national reference value (34.94); Indicator 34 (e energy consumption expenditure per ten thousand yuan of income) also

became closer to the national reference value (95.44), but the speed of improvement was slow; Indicator 36 (asset-liability ratio) was significantly better than that of CZ Hospital, fluctuating around 30%, lower than the national reference value (47.17) (see Annex H).

Regarding QY Hospital, Indicator 31 (proportion of medical service revenue (excluding drugs, consumables, examination and testing revenue) to medical revenue) and Indicator 36 (asset-liability ratio) remained at normal levels during the three-year period; Indicator 33 (proportion of personnel expenditure to business expenditure) increased year by year until it exceeded the national reference value. Indicator 34 (energy consumption expenditure per ten thousand yuan of income), Indicator 35 (balance of income and expenditure) and Indicator 37 (medical income growth rate) increased gradually to be close to the national reference values year by year. These three financial indicators changed from slightly high to normal, as shown in Annex I.

In the internal business process dimension, all indicators were developing better and better in CZ Hospital. Among them, Indicator 4 (proportion of discharged patients undergoing surgery) and Indicator 17 (defined daily dose (DDDs)) were better than the values recommended by the state government (4-45 and 17-40, respectively) and were getting better; Indicator 6 (proportion of discharged patients who underwent a Level 4 surgery) and Indicator 24 (function application level of the electronic medical record) were gradually developing, but were still significantly below the values recommended by the state government (6-40 and 24-8, respectively).

The trend of change of GZ Hospital was identical to that of CZ Hospital, with all indicators exhibiting positive development. Besides, Indicator 4 (proportion of discharged patients who underwent a surgery) of GZ Hospital was at a higher level than CZ Hospital; Indicator 6 (proportion of discharged patients who underwent a Level 4 surgery) was lower and far away from the national reference value; Indicator 17 (defined daily dose (DDDs)) of GZ Hospital was higher compared to CZ Hospital and needs to be further lowered; and Indicator 13 (the number of clinical test items that have passed the national external quality assessment) was developing relatively faster.

QY Hospital was behind the two hospitals in all the indicators. Specifically, its Indicator 4 (proportion of discharged patients who underwent a surgery) and Indicator 6 (proportion of discharged patients who underwent a Level 4 surgery) were lower than the first two hospitals; Indicator 17 (defined daily dose (DDDs)), though lower than the national reference value, was on the rise and needs to be controlled; Indicator 13 (the number of clinical test items that have passed the national external quality assessment) and Indicator 24 (function application level of the electronic medical record) were relatively well developed among these three hospitals.

The customer dimension is irrelevant for hospital managers. Thus, it is not discussed here.

In the learning and growth dimension, inadequate research funds and relative shortage of anesthesiologists, pediatricians and nurses were common problems facing the three hospitals. The percentages of anesthesiologists, pediatricians and pathologists were relatively low and showed no significant improvement during the three-year period. Besides, the doctor-nurse ratio was significantly high, indicating a shortage of nurses; Indicator 50 (fund for scientific research projects per 100 health technicians) increased in 2019, followed by a significant drop in 2020, and was overall largely away from the national reference value. As to GZ Hospital, its proportion of pediatricians still lagged significantly behind the national reference value despite improvement in the three years; its doctor-nurse ratio was also significantly higher than recommended, while its Indicator 50 (fund for scientific research projects per 100 health technicians) was significantly lower than recommended. QY Hospital was identical to CZ Hospital. Specifically, Indicator 45 (the proportions of anesthesiologists, pediatricians, intensive care specialists, pathologists and TCM practitioners) was lower than the national reference value and showed no significant improvement; the doctor-to-nurse ratio was higher than recommended; and Indicator 50 (fund for scientific research projects per 100 health technicians) was lower than recommended.

Overall, among the indicators relevant to hospital managers, the financial indicators of all the three sample hospitals were gradually returning to normal. It is worth noting that the asset-liability ratio (Indicator 36) of CZ hospital was high and did not improve significantly, and its function application level of the electronic medical record (Indicator 24) was low; in addition, all the three hospitals faced an unbalanced doctor-nurse ratio (Indicator 46).

4.2.2 Trends of change in the key indicators of the "National Appraisal" most relevant to clinicians

The indicators most relevant to clinicians under the internal business process dimension are Indicator 5 (proportion of discharged patients who underwent a minimally invasive surgery) and Indicator 25 (number of inpatients per doctor per day) and those under the learning and growth dimension are Indicator 48 (the pass rate of hospital residents taking the Qualification Examination for Doctors for the first time) and Indicator 55 (medical staff satisfaction). No indicators in the financial and customer dimensions are relevant to clinicians.

In the internal business process dimension, CZ Hospital had a high proportion of discharged patients who underwent a minimally invasive surgery (Indicator 5), which dropped from 48.87% in 2018 to 36.24% in 2020, both higher than the national reference rate of 25%; there was no

significant change in the number of inpatients per doctor per day (Indicator 25). GZ Hospital also performed better in the proportion of discharged patients who underwent a minimally invasive surgery (Indicator 5), which dropped from 67.2% in 2018 to 40.59% in 2020, higher than the national reference rate; the number of inpatients per doctor per day (Indicator 25) in GZ Hospital decreased from 3.27 in 2018 to 2.75 in 2020, representing a decrease in workload. But it was significantly higher compared to CZ Hospital (see Annex J). The proportion of discharged patients who underwent a minimally invasive surgery (Indicator 5) in QY hospitals rose from 16.89% in 2018 to 19.33% in 2020, but still fell short of the national reference value and was significantly lower than those in CZ Hospital and GZ Hospital; and the number of inpatients per doctor per day (Indicator 25) decreased from 2.71 in 2018 to 2.02 in 2020, representing reduced workload. See Annex K for details.

In the learning and growth dimension, the pass rate of hospital residents taking the Qualification Examination for Doctors for the first time (Indicator 48) at CZ Hospital ranged from 80% to 87%, with a big room for improvement to reach the national reference rate of 100%; and medical staff satisfaction (Indicator 55) increased from 91.18% in 2018 to 96.43% in 2020, exceeding the national reference rate of 85%. The pass rate of hospital residents taking the Qualification Examination for Doctors for the first time (Indicator 48) at GZ Hospital increased from 86.2% in 2018 to 95.3% in 2020, showing rapid growth and better than CZ Hospital; medical staff satisfaction (Indicator 55) fluctuated around 95%. The pass rate of hospital residents taking the Qualification Examination for Doctors for the first time (Indicator 48) at QY hospital ranged from 63.93% to 76.4%, significantly lower than the rates at CZ Hospital and GZ Hospital, while medical staff satisfaction (Indicator 55) at QY hospital increased from 83.3% in 2018 to 92.5% in 2020.

Overall, among the indicators relevant to clinicians, CZ Hospital and GZ Hospital got significantly higher scores than QY Hospital, and clinicians in GZ Hospital had a heavier workload. See Figure 4.2 for details.

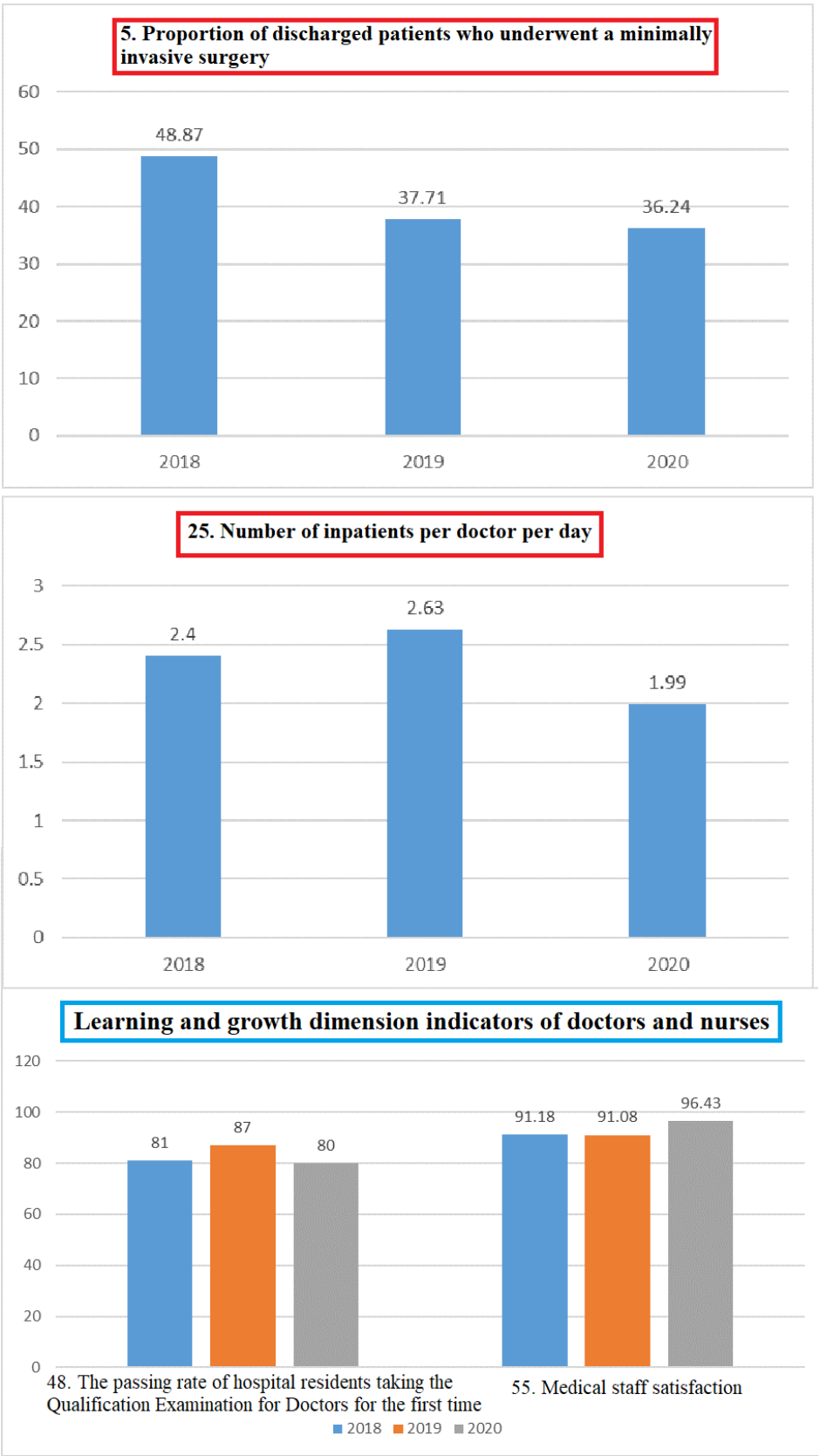


Figure 4.2 Trends of change in the key indicators of the "National Appraisal" for clinicians of CZ Hospital from 2018 to 2020

Note: The indicators in the red square brackets are internal business process indicators, and those in the blue square brackets are learning and growth indicators.

4.2.3 Trends of change in the key indicators of the "National Appraisal" most relevant to patients

There are 11 key indicators of the "National Appraisal" most relevant to patients in tertiary public hospitals, and they are mainly distributed in the customer dimension (eight indicators) and internal business process dimension (three indicators) of the balanced scorecard. Through an analysis of the data of the sample hospitals' performance appraisal indicators, the trends of change in the indicators most relevant to patients for each sample hospital are as follows.

In terms of CZ Hospital, Indicator 22 (average outpatient appointment rate) rapidly increased from 47.86 in 2018 to 89.4 in 2020, reflecting the rapid development of hospital information technology; Indicator 23 (average waiting time for an outpatient visit after the appointment) increased from 11.81 minutes in 2018 to 26 minutes in 2020; Indicator 38 (rate of increase in outpatients' medical expense per visit) dropped from the high rate of 42.34% in 2019 to 0 in 2020; Indicator 39 (rate of increase in outpatients' medication expense per visit) exhibited a similar trend of change, dropping from 43.18% in 2019 to -22.18 in 2020; Indicator 40 (rate of increase in average medical expense per inpatient) slightly increased; Indicator 41 (rate of increase in average medication expense per inpatient) slightly decreased; Indicator 53 (outpatient satisfaction) and Indicator 54 (inpatient satisfaction) decreased, but both remained above 90%.

Overall, GZ Hospital performed better than CZ Hospital. Its average outpatient appointment rate (Indicator 22) increased from 89.28 in 2018 to 91.07 in 2020; average waiting time for an outpatient visit after the appointment (Indicator 23) was also relatively short, remaining between 7.5 minutes and 10.2 minutes; rate of increase in outpatients' medical expense per visit (Indicator 38) remained at a low level, with negative growth in all the three years; rate of increase in outpatients' medication expense per visit (Indicator 39), rate of increase in average medical expense per inpatient (Indicator 40) and rate of increase in average medication expense per inpatient (Indicator 41) all remained at low levels in the three years, with medication expense showing negative growth; outpatient satisfaction (Indicator 53) and inpatient satisfaction (Indicator 54) both remained above 95%. See Annex L for details.

QY Hospital's overall performance of indicators in the customer dimension was poorer than the other two hospitals. Specifically, its average outpatient appointment rate (Indicator 22) increased from 50.1% in 2018 to 79.15% in 2020, but still relatively low; average waiting time for an outpatient visit after the appointment (Indicator 23) remained above 20 minutes; Indicators 38, 39, 40, 41 and other indicators reflecting medical expenses all exhibited positive

growth with a trend of increase in the growth rate, indicating that patients need to bear a heavy burden of medical expenses and there was no significant improvement; outpatient satisfaction (Indicator 53) and inpatient satisfaction (Indicator 54) were both low, with the former being lower than 90%. See Annex M for details.

In the internal business process dimension, incidence of postoperative complications (Indicator 8) at CZ Hospital decreased from 0.79 in 2018 to 0.71 in 2020, while surgical site infection rate of aseptic operations (Indicator 9) and mortality rate of cases in the low-risk group (Indicator 14) remained at 0, both below the national reference thresholds. The incidence of postoperative complications (Indicator 8) at GZ Hospital was relatively low, decreasing from 0.9 in 2018 to 0.16 in 2019 and to 0.18 in 2020, while surgical site infection rate of aseptic operations (Indicator 9) was 0.12 in 2019 and 0.07 in 2020; mortality rate of cases in the low-risk group (Indicator 14) remained at 0%. The incidence of postoperative complications (Indicator 8) at QY Hospital was also at a low level, ranging from 0.43 to 0.61; surgical site infection rate of aseptic operations (Indicator 9) ranged from 0.04 to 0.07; and the mortality rate of cases in the low-risk group (Indicator 14) also remained at 0%.

Overall, among the patient-related appraisal indicators in the customer dimension, GZ Hospital got the highest scores; CZ Hospital got the second highest scores but underwent rapid changes from 2018 to 2020; and QY Hospital got the lowest scores and had no significant improvement in most indicators. All the three hospitals performed well in the patient-related appraisal indicators of the internal business process dimension with none of the indicators exceeding the national reference thresholds. See Figure 4.3 for details.

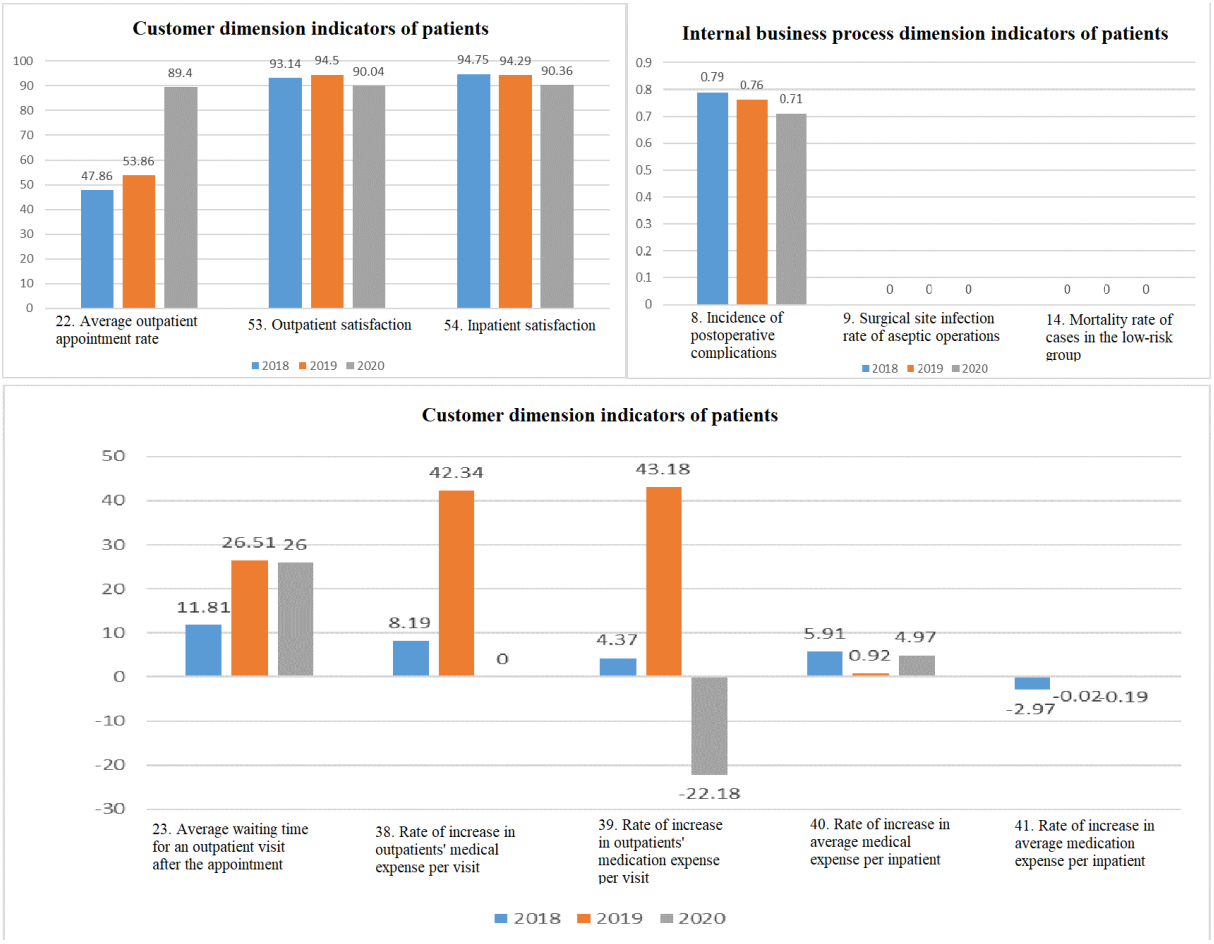


Figure 4.3 Trends of change in the key indicators of the "National Appraisal" for patients of CZ Hospital from 2018 to 2020

4.2.4 Trends of change in the key indicators of the "National Appraisal" most relevant to health authorities

There is only one indicator most relevant to health authorities, which is Indicator 2 (number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations) under the internal business process dimension of the balanced scorecard. It is an indicator reflecting health authorities' hierarchical diagnosis and treatment, requiring tertiary hospitals to transfer patients with common diseases to county-level hospitals. The number of referrals to lower-level hospitals at CZ Hospital exhibited a downward trend, from 92,000 referrals in 2018 to 36,000 referrals in 2020, indicating that the hospital reduced its efforts in the implementation of hierarchical diagnosis and treatment. In contrast, the number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations) at GZ Hospital increased year by year, from 3,257 in 2018 to 5,889 in 2020. The number of referrals to lower-level hospitals also increased from 77,000 in 2018 to 195,000 in 2020. See Annex N for details.

4.3 Semi-structured interviews with key stakeholders from the sample hospitals

4.3.1 Remarks of each stakeholder to the "National Appraisal" indicators

The key stakeholders identified by the respondents were again clinicians, patients, hospital managers, and health authorities. Overall, the appraisal task was primarily undertaken by hospital managers who were directly responsible for implementation. Besides, three managers and nearly half of the clinicians identified clinicians as the primary implementers, taking on more tasks than hospital managers.

There was abundant feedback on the appraisal of clinicians based on the "National Appraisal". Both hospital managers and clinicians believed that "the workload of scientific research assessment is heavy", "there is not enough attention to the interests of clinicians", and "doctors' normal treatment of patients is affected" are the main problems existing in the appraisal of clinicians.

For example, *"[T]here is not enough attention to the interests of clinicians. As a result, the actual satisfaction of clinicians is not high. The indictors fail to reflect the interests of clinicians. Out of the 55 indicators, only one indicator concerns the satisfaction of clinicians. Do you think clinicians will be satisfied?" (Ca5)*

"The priority of clinicians is to provide medical care to patients and make patients satisfied. However, sometimes their responsibility conflicts with the 'National Appraisal' indicators. For example, whether a patient should undergo surgery should be considered based on the patient's condition and affordability. Clinicians should not be required to make choices based on the 'National Appraisal' indicators." (Ga2)

Meanwhile, the codes worthy of attention include "Clinicians should have a greater say in the choice of indicators" and "An incentive mechanism should be set up", which are worth exploring. For example, *"[T]hese indicators should be generated to increase the engagement of clinicians. They should not be set by the senior management solely based on how they think without due consideration of clinical decisions." (Cd4)*

The importance of the indicator system to the interests of patients was recognized by most of the interviewees. The system gives an overall consideration of the healthcare services obtained by patients from multiple perspectives such as quality of care, cost, and convenience. Detailed coding results are shown in Table 4.5.

Table 4.5 Two-level codes on the extent to which the key indicators of the "National Appraisal reflect the status of all parties' commitments and interests

Leve 1 codes	Leve 2 codes	Hospital managers	Doctors and nurse	Representatives of health authorities	Total
Key stakeholders most relevant to the indictor		13 interviewees	6 interviewees	2 interviewees	21 interviewees
Clinicians	Clinicians	13	6	1	20
Patients	Patients	12	6	2	20
Hospital managers	Hospital managers	12	4	1	17
Health authorities	Health authorities	9	1	2	12
Percentage of appraisal task performance		16 interviewees	11 interviewees	2 interviewees	29 interviewees
Doctors undertake 45% of the task. Doctors undertake 40% of the task. Doctors undertake 1/3 of the task. Managers undertake 50-95% of the task.	A large share of the task (over 50%) undertaken by managers	12	4	0	16
Doctors undertake 70% of the indicators. Doctors undertake 70-80% of the indicators. Doctors undertake 60% of the indicators. Doctors undertake over 50% of the indicators. Managers undertake 40% of the indicators. Clinicians undertake at most 60% of the indicators.	A large share of the task (over 50%) undertaken by clinicians	3	5	0	8
Indicators are highly relevant to nursing care. Department directors and clinicians are the primary implementers. Implementation by clinical department leaders is important, and department directors lack motivation.	Clinical departments as the main performers	2	4	0	6
Each indicator is assigned to the corresponding leader. For indicators with low scores, the respective managers will be punished accordingly. The party secretary and the president are the responsible persons.	Managers as responsible persons for indicators	2	0	2	4
Development goals need to be identified. Communication of instructions is insufficient. Indicators have a guiding role. Hospital managers are responsible for guiding implementation.	Delivery of instructions by managers	3	0	1	4
Appraisal of doctors based on the indictors		16 interviewees	10 intervie	0 interviewee	26 interviewees

Leve 1 codes	Leve 2 codes	Hospital managers	Doctors and nurse	Representatives of health authorities	Total
			wees		
It is difficult to acquire scientific research projects. We need to undergo hierarchical appraisals. Scientific research takes up excessive weight. Regional hospitals are mainly focused on clinical care and have lower requirements for scientific research indicators.	Heavy workload of scientific research assessment.	11	2		13
There are limited indicators relevant to interests. The interests of clinicians are not adequately considered. Interests are not reflected.	Inadequate attention to the interests of clinicians	8	4		12
The appraisal indicators conflict with patients' conditions. Over-treatment is performed on those who should not undergo surgery. Doctors do not dare to prescribe drugs for those who should be prescribed drugs. The required drugs are not procured. There are restrictions on patient care. The cost of drugs and consumables hinder the development of new technologies.	Adverse impact on doctors' normal treatment of patients	7	2		9
The same measures are reasonable. The indicators are reasonable. Most indicators are reasonable.	Reasonable appraisal indicators	7	1		8
The true workload of clinicians is not reflected. The degree of association with nurses is low. Nurses need to undertake heavy tasks. Indicators related to nursing are limited.	The need to pay attention to the efforts made by clinicians	6	1		7
Main performers. Clinicians are the main performers.	Main performers	3	1		4
Clinicians have little say. The engagement of clinicians in setting the indicators should be increased.	The need to increase the say of clinicians in the choice of indicators	2	1		3
Satisfaction is related to our salary packages. More incentives are needed, and penalties should be reduced.	The need to set up an incentive mechanism	2	1		3
The appraisal has helped enhance our diagnosis and treatment capacity as well as our scientific research ability.	Improved work ability due to the appraisal	2	0		2
Our workload has increased as a result.	Increased workload due to the appraisal	1	0		1
The appraisal has helped reduce our burden by improving operational efficiency.	Enhanced work efficiency due to the appraisal	0	1		1
The appraisal's consideration of patients' interests		15 interviewees	10 intervie	0 interviewee	25 interviewees

Leve 1 codes	Leve 2 codes	Hospital managers	Doctors and nurse wees	Representatives of health authorities	Total
Healthcare quality, medical technology and healthcare quality, safety of care There is a high degree of attention.	Attention to healthcare quality A high degree of attention	13 10	3 6		16 16
Medical expenses	Attention to medical expenses	9	2		11
Convenience of diagnosis and treatment	Attention to convenience of medical care	3	0		3
Patient satisfaction	Attention to satisfaction	2	1		3
Not many indicators reflect patients' interests. The proportion should be further increased.	Inadequate indicators	1	1		2
Total number of Level 1 codes: 65	Total number of Level 2 codes: 26				Total coding frequency: 221 times

Based on the above empirical results, the answers to RQ1 *(Who are the key stakeholders of tertiary public hospitals? To what extent are the "National Appraisal" indicators related to these key stakeholders? Are the demands of the key stakeholders balanced and taken into due account?)* are as follows:

Hospital managers are the main responsible persons; clinicians, as the main performers, undertake most of the appraisal tasks; the interests of patients as the recipients of healthcare services are fully attended to, while the interests of clinicians as the providers of healthcare services are relatively neglected. It is worth noting that health authorities as one type of the key stakeholders make the rules for the delivery of healthcare services but are barely involved in the game. Local governments do not provide specific support for the implementation of the "National Appraisal", meaning their power and responsibilities are not balanced. Therefore, while strengthening the appraisal of healthcare service providers, there is also a need to strengthen the responsibilities that health authorities should assume in performance appraisal.

4.3.2 Path to the implementation of the "National Appraisal" in hospitals

The sample hospitals all have an independent department responsible for implementing hospital-wide performance appraisal, with CZ Hospital and GZ Hospital led by the quality management office and QY Hospital led by the accreditation and evaluation department. The specific path is clear. In general, "the competent department assigns the indicators to each functional department". Then the functional department conveys the indicators to each department. The department directors are responsible for conducting performance appraisal of the indicators, implementing the indicators in daily diagnosis and treatment, and regularly summarizing the indicators and reporting them to the corresponding functional department. Meanwhile, each functional department monitors the completion of the indicators in real time, assesses the implementation, and provides feedback on the implementation to the respective department.Health authorities also have an independent department responsible for performance appraisal, which urges hospital leaders to implement the "National Appraisal" indicators in tertiary public hospitals through administrative means such as "fund allocation and appropriation" and "change of hospital leadership positions".

Implementation of the appraisal indicators is mainly realized through administrative means, following a top-down approach from health authorities to hospital leaders to department directors and finally to clinicians through the performance appraisal means. The Level 2 codes of the keywords in the implementation process are shown in Table 4.6.

Table 4.6 Two-level codes on the implementation pathway of the "National Appraisal" in hospitals

Level 1 codes	Level 2 codes	Hospital managers (14 interviewees)	Clinicians (11 interviewees)	Representatives of health authorities (two interviewees)	Total
Appraisal of economic indicators, appraisal of healthcare quality indicators, real-time appraisal feedback, daily appraisal of indicators by the quality control department, quarterly appraisal, and application of appraisal results by the organization and personnel department	Real-time appraisal feedback	17	9	1	27
Communication of indicators to department directors through meetings, assignment of indicators to the relevant departments, linkage of appraisal to performance, target appraisal responsibility letter, performance appraisal	Assignment of indicators to relevant departments	20	0	0	20
Communication of indicators to department directors through meetings, assignment of indicators to the relevant departments, linkage with performance, target appraisal responsibility letter, performance appraisal	Linkage with performance	14	3	2	19
Dedicated management to monitor the completion of departmental indicators, regular meetings to summarize indicators, real-time monitoring, monitoring of the completion of indicators by healthcare administration departments, monthly summaries by departments	Real-time monitoring of implementation progress	9	8	1	18
Establishment of hospital, departmental and individual indicators, ex-ante management, integration with comprehensive target management assessment, linkage between "National Appraisal" indicators and department indicators, and assignment of indicators to clinical department for daily execution	Assignment of indicators to clinical department for daily execution	3	10	0	13
The director of each department carried out appraisal in the respective department. The department	Implementation of	6	6	0	12

Level 1 codes	Level 2 codes	Hospital managers (14 interviewees)	Clinicians (11 interviewees)	Representatives of health authorities (two interviewees)	Total
director assigns indicators to clinicians for implementation. Other departments aid implementation, including the nursing department, medical affairs office, performance appraisal office, and quality control office	appraisal in each department by the department director				
The director of each department carries out appraisal in the respective department. The department director assigns indicators to clinicians for implementation. Other departments assist in implementation, including the nursing department, medical affairs office, performance appraisal office, and quality control office.	Assistance from functional departments in the implementation of indicators to other departments	10	0	0	10
Fund allocation and appropriation, changes in hospital leadership positions, supervision by administrative means	Supervision by administrative means	0	0	5	5
Assignment of indicators to each functional department by the Appraisal Review Office	Assignment of indicators to functional departments by the competent department	2	0	0	2
Total number of Level 1 codes: 32	Total number of Level 2 codes: nine				Total coding frequency: 126 times

Based on the above empirical results, the answer to RQ5.1 *(How should the "National Appraisal" indicators be aligned with hospitals' organizational strategy and be implemented?)* is as follows:

Each sample hospital has an independent department dedicated to implementing performance appraisal. The balanced scorecard is used to assign the appraisal indicators to the corresponding functional departments, which will communicate the indicators to the department directors until the indicators are finally assigned to the finance, clinical and other departments and implemented in daily work. The data are reported on a quarterly basis. Each functional department monitors the completion of the indicators in real time, assesses the implementation, and feeds back the results to the department. The study reveals that the stakeholders of each hospital have failed to express a clear organizational strategy, nor have they managed to link the organizational strategy to the performance appraisal indicators.

4.3.3 Changes brought to key stakeholders by the "National Appraisal"

The results of the interviews indicate that the most important role of the "National Appraisal" is to clarify hospital development directions and the functional positioning of tertiary public hospitals as well as to facilitate and guide hospital reform. Hospitals have become selective in admitting patients, especially inpatients. See Table 4.7.

Table 4.7 Two-level codes on the positive impact brought by implementation of the "National Appraisal"

Level 1 codes	Level 2 codes	Frequency
Baton role; developed understanding of the status of hospital development; identified development goals; orientation towards patients' needs; developed understanding of our own development level; identified our weaknesses and development direction; orientation towards solving problems; comprehensive development in all indicators; clarified the positioning of tertiary hospitals; enhanced public interest orientation; a guiding role in identifying the direction of improvement; a significant development in the previously neglected indicators such as the pass rate of hospital residents taking the Qualification Examination for Doctors for the first time; increased motivation in scientific research; and more emphasis on scientific research development	A clarified hospital development direction	40
Set surgical performance; advocated difficult surgeries; increased the proportion of discharged patients who underwent a surgery; increased the proportions of discharged patients who underwent a Level 3 or Level 4 surgery; increased the motivation to perform high level surgeries	Advocation of difficult surgeries	24

Level 1 codes	Level 2 codes	Frequency
Improved patient consultation process; upgraded information technology; established the five-level electronic medical record; increased information technology investment; controlled bed utilization rate to reduce doctors' burden; hierarchical diagnosis and treatment; increased operational efficiency; upgraded information technology development; and improved operational efficiency	Enhanced hospital operational efficiency	24
Improved healthcare quality and safety; analyzed the causes of complications; improved diagnosis and treatment outcomes; and improved healthcare services.	Improved healthcare services	18
Emphasis on high-quality development, lean management, structural adjustment, and health insurance cost control while achieving revenue growth	Improved management	12
Strengthened discipline development and specialty training; established new departments with staff and equipment; formed superior disciplines; emphasized the development of surgical and critical care as well as new technologies.	Strengthened discipline development	10
Rational allocation of resources; adjustment of the proportion of beds in the internal medicine department to those in the surgical department; physician adoption of surgical procedures; optimized distribution of resources in the internal medicine department and the surgical department	Reasonable allocation of resources	9
Selective admission of patients; focus on solving difficult miscellaneous diseases; admission of more patients requiring surgery	Admission of patients according to the positioning of Grade A tertiary hospitals	8
Focus on patients' interests; improved patient satisfaction; and emphasis on patients' interests	Emphasis on patients' interests	8
Invited external experts to deliver coaching and mentoring sessions; participation in training abroad; invited experts from other hospitals to provide guidance; increased learning and training sessions.	Development of doctor's professional competence	6
Reduced intensity of the use of Defined daily dose (DDDs); standardized medical practices; strict adherence to admission criteria	Standardized diagnosis and treatment	6
Talent cultivation; talent introduction	An increased number of talents	5
Drivers of change; reduced manager-physician conflict in the reform process	Provision of reform drivers	2
More focus on employee and patient satisfaction and improved employee satisfaction	Improved employee satisfaction	2
Total number of Level 1 codes: 74	Total number of Level 2 codes: 15	Total coding frequency: 174 times

For example, *"[T]ake the surgical system for example. It selects inpatients, and not all patients can be admitted to the hospital. The 'National Appraisal' emphasizes the proportion of Level 4 surgeries and minimally invasive surgeries. To increase the proportions of these two types of surgeries, doctors cannot place patients who do not have indications for surgery*

[researcher's note: In clinical practice, patients are only qualified for survey when they have certain disease characteristics] or who do not need to be hospitalized. Instead, they should directly place such patients in outpatient care or for daytime surgery. Previously, patients were admitted to the hospital for hospitalization without screening. This change has enabled doctors to really solve intractable and severe cases and live up to the reputation of tertiary public hospitals." (Qa1)

The "National Appraisal" has helped us upgrade our level of medical care, strengthen discipline development and talent training, and enhance our hard power.

For example, *"[W]e have established a minimally invasive interventional unit to increase the proportion of minimally invasive procedures. We have also invested in relevant equipment and personnel. To improve medical technology, we have sent our staff to study abroad." (Ga5)*

The "National Appraisal" has also led to improvement in our soft power such as operational efficiency and management.

For example, *"[W]e have established a patient-centered information system. Our hospital is experimenting the model featured by "payment after diagnosis and treatment". The information system is built with the convenience of patients in mind. For example, patients can make appointments directly with their medical insurance cards and pay for the remaining fees themselves after the amount covered by medical insurance is settled. Besides, it also helps reduce the waiting time for an outpatient visit after the appointment." (Ca7)*

Meanwhile, software was used to generate a word cloud for the words that appeared frequently in Level 1 codes, which allows readers to visualize the frequency of the key words out of the Level 1 codes as indicated in Annex O.

As to the specific frequency of responses by different stakeholders, the managers' responses mostly focus on hospital development direction and operational management, while the doctors' responses focus on aspects such as the level of healthcare services and business competence improvement. The high-frequency words of stakeholder responses are also generally consistent among different hospitals, with "a clarified hospital development direction", "enhanced hospital operational efficiency", "improved management", "strengthened discipline development", and "improved healthcare services" ranking among the first by frequency of appearance. "Advocation of difficult surgeries" appeared more frequently in CZ Hospital. Similarly, "admission of patients according to the positioning of Grade A tertiary hospitals" appeared with higher frequency in QY hospital. Both hospitals attached great importance to the positioning of hospitals to solve difficult miscellaneous diseases. See Annex P for details.

Based on the above empirical results, the answer to RQ3 (What benefits and positive

changes has the implementation of the "National Appraisal" brought to the key stakeholders?) is as follows:

The main benefit brought by the implementation of the "National Appraisal" is that it has enabled hospitals to clarify their direction for improvement and development positioning, which is reflected in improved healthcare services, enhanced operational efficiency, strengthened discipline development, and improved management performance. For hospital managers and health authorities, implementation of the "National Appraisal" has helped them clarify orientation and development direction, provided them with sufficient motivation to advance reform and improve operational efficiency, management performance and healthcare services, which ultimately benefits patients. For doctors and nurse, implementation of the "National Appraisal" has contributed to their improved business ability, provided them with more training and learning opportunities, and provided patients with standardized diagnosis and treatment.

4.3.4 Challenges and dilemmas in the "National Appraisal" implementation

The challenges and dilemmas facing the implementation of the performance appraisal are broadly divided into two categories. The first category denotes that the implementation of positive guidance indicators is quite difficult and requires funding, talent and policy support in many aspects. For prefecture-level cities in the "middle layer of the sandwich", "a lack of professional talents", "difficult access to patients with difficult miscellaneous diseases" and "need for more financial investment" are the top codes by frequency.

For example, *"[P]refecture-level hospitals are the middle layer of the sandwich. County-level hospitals directly transfer the intractable and severe patients emphasized in the 'National Appraisal' to larger-scale hospitals in provincial capitals. As a result, prefecture-level hospitals do not have so many surgery patients and critically ill patients. In addition, in terms of the scientific research, the fund for scientific research projects per 100 health technicians needs to reach nine million for research projects to get full scores. We simply cannot meet this requirement. We still have a long way to go." (Qa2)*

The second category is about the lack of alignment between appraisal indicators and the reality in the destruction and reconstruction of the old order. In the process of implementing the indicators, the vested interests of various actors will render implementation difficult, such as the conflict between some policy-oriented indicators and the vested interests of "patients", "hospitals" as well as "clinicians". In the process of implementing the indicators, some patients are affected by the conflict and can hardly access their desired healthcare services.

For example, *"[T]op hospitals in provincial capitals arrange for patients to be discharged*

after three to five days of surgical treatment or transferred to prefecture-level hospitals and local hospitals for post-operative rehabilitation. However, in prefecture-level cities, community support has not been established, and patients are discharged after surgery without removing the stitches, resulting in low levels of patient satisfaction and increased days of hospitalization, which eventually affect the performance of the 'National Appraisal' indicators." (Ga2)

The control of medical expenses also causes greater operational pressure to hospitals or conflicts with the principles of clinical diagnosis and treatment.

For example, *"[T]he 'National Appraisal' is the focus of the national healthcare authorities. But some indicators conflict with indicators of the medical insurance department, such as the pressure of hospital survival and development and the pressure of medical insurance payment." (Ga4)*

The harm caused to the interests of clinicians will ultimately affect the interests of patients.

For example, "*[T]he ratio of drugs and the ratio of consumables are set according to different departments and patients. Clinicians are given this target and need to meet it. If we have to meet the hard targets, there will be protocols that are not compatible with patient care"* (Cd4). See Table 4.8.

Table 4.8 Two-level codes on the "National Appraisal" implementation challenges

Level 1 codes	Level 2 codes	Frequency
Lack of professional managers, weak scientific research, lack of talents, and difficulty to improve scientific research capacity	Lack of professional talents	17
Difficulty to increase the proportion of Level 4 surgeries; reluctance of county-level hospitals to transfer patients to higher-level hospitals; choice of severe patients to go to higher-level hospitals; lack of critically ill patients; empty beds in municipal hospitals resulting from the principle that "major diseases should be treated within the county"; high bed vacancy rate due to bed expansion; how to ensure patient referrals to higher-level hospitals; insufficient sources of patients amid technology improvement; loss of patients and talents in prefecture-level hospitals	Difficulty in obtaining patients with difficult miscellaneous diseases	16
Lack of uniform charging standards for the same surgery; significant loss of points in cross-level evaluation; too much idealism and lack of feasibility	Lack of general applicability of the indicators	12

Level 1 codes	Level 2 codes	Frequency
of some indicators; the need to focus more on clinical competence in professional title evaluation; inappropriateness to apply the same set of appraisal indicators for all types of hospitals.		
Need for information system support; large investment; insufficient government support; and low resource investment in prefecture-level cities	Need for financial input in multiple aspects	12
Lack of community hospitals to meet demand after reducing admissions of patients into internal medicine department and old-age patients; conflict between the "National Appraisal" indicators and patients' interests; reduced patient satisfaction due to shortened length of hospital stay; 48-hour validity of appointment; inconvenience to access treatment for internal medicine patients; conflict between indicators and patients' treatment needs; challenges in controlling medical expenses; increased ratio of consumables as good care requires good consumables; balance and alignment between directive tasks and patients' needs; difficulty to meet patients' needs due to the lack of resources in community hospitals	Conflict between indicators and patients' needs	10
Contradictions between increasing scores and hospital operation and development; conflict between hospital survival and development and medical insurance payment pressure; huge pressure on hospital profitability; ensuring hospital operation while improving "National Appraisal" scores; contradictions between new technologies and medical costs; ensuring survival first before considering indicators; balance between hospital development and public interest; balance between healthcare quality and safety and medical expenses	Conflict between indicators and hospital needs	8
Need to change medical practices and habits; need to increase engagement of clinicians; need to improve the accuracy of data collection; high demands on leadership management ability; high pressure on functional departments; low level of medical care	Higher requirements on staff's level of expertise	7
Pressure to restructure business; too many high-intensity surgeries and uncertain development prospects for surgeons and physicians; too low cost of care; and difficulty in boosting healthcare service revenue in the internal medicine department	Conflict between indicators and the interest of clinicians	5
Conflict between clinical treatment plan and the "National Appraisal" indicators; influence on doctors' choice of the optimal treatment plan	Conflict between indicators and the diagnosis and treatment standards	2
Impact of the COVID-19 pandemic	Impact of the COVID-19 pandemic	2
Total number of Level 1 codes: 55	Total number of Level 2 codes: 10	Total coding frequency: 91 times

Regarding the responses of different stakeholders, managers mostly expressed their opinions from a management perspective, with the top three pieces of feedback by frequency being "lack of professional talents", "need for financial input in multiple aspects" and "lack of general applicability of the indicators, as indicated in Annex Q.

For example, *"[T]he fees charged in different provinces and cities are different. There are no uniform charging standards nationwide. Doctors make the same efforts, but they charge different fees. How do we carry out appraisal in this aspect when the fees charged for the same surgery differ?" (Ga4)*

Clinicians mainly proceeded from the clinical perspective. The top three pieces of their feedback by frequency are "difficulty in obtaining patients with difficult miscellaneous diseases", "lack of professional talents", and "conflict between indicators and patients' needs", followed by the excessive weight of scientific research assessment.

For example, *"[R]egarding some basic scientific research assessments, clinicians do not have the time and energy on the one hand, and it does not fall into the areas of their expertise on the other hand. Performance appraisal should be carried out in different departments for hospitals at different levels. Performance appraisal of some large laboratories should be carried out using scientific research indicators. However, there is no need to look at scientific research indicators for clinicians." (Cd4)*

In addition, clinicians held that the appraisal had affected the normal treatment to some extent.

For example, *"[I]n terms of the implementation of indicators, everyone has different degrees of acceptance and different implementation strength. Delivery of good care may require the use of good consumables, which will take up the share of consumables and cause conflict." (Qd4).*

Meanwhile, a word cloud of the words that appeared with high frequency in Level 1 codes on implementation challenges was generated, which provides a visual presentation of the frequencies of occurrence of various keywords as indicated in Annex R.

Based on the above empirical results, the answer to the first sub-question of RQ4 *(What are the challenges faced by tertiary public hospitals at the prefecture level in the implementation of the "National Appraisal"?)* is as follows:

On the one hand, it is quite difficult to implement some of the indicators of positive guidance as it requires support from various aspects such as funding, talents and policies. Prefecture-level cities, which are the middle layer of the sandwich, are faced with the "lack of professional talents", "difficulty in obtaining patients with difficult miscellaneous diseases",

and "lack of financial investment" compared with first-tier cities; on the other hand, in the destruction and reconstruction of the old order, some of the appraisal indicators are poorly oriented to fit the reality of the hospitals, and the indicators will affect the vested interests of multiple players in the implementation process, making their implementation tough. For example, some policy-oriented indicators conflict with the interests of "patients", "hospitals", and "clinicians", which ultimately affects the interests of patients. All these are the problems faced by the current appraisal.

4.3.5 The main drivers of successful implementation of the "National Appraisal"

The most important guarantee for successful implementation of the "National Appraisal" is the need for attention and support from the management. Whether the implementation of the "National Appraisal" can strongly advance given that it may affect the interests of all parties and whether the resistance and difficulties encountered can be successfully resolved are both crucial for its implementation. Managers need to understand the indicators in depth at the strategic level, while combining with scientific management methods.

For example, *"[I]t should not be done as a task. Instead, it is a need for the hospital's operation and development and should be integrated into the daily management and work to deliver satisfactory outcomes. Appraisal should not be carried out for the sake of appraisal. Instead, it should be aligned with the strategic goals of the hospital." (Ca2)*

Implementation should be advanced with the input of human, material and financial resources.

For example, *"[T]he support from health authorities should be adequate so as to truly support the sustainable development of the hospital." (Ca4)*

Meanwhile, attention should also be paid to the feedback and adjustment of indicators.

For example, *"[T]he indicator system needs to be optimized, and more consideration given to patients' needs for clinical treatment, to treat patients' diseases. Prefectural-level hospitals have not paid more attention to clinical medical technologies, and it is necessary to reduce the proportion of appraisal indicators on scientific research." (Ga2)* See Table 4.9 for details.

Table 4.9 Two-level codes on main factors influencing the successful implementation of the "National Appraisal"

Level 1 codes	Level 2 codes	Hospital managers (15 interviewees)	Clinicians (six interviewees)	Representatives of health authorities (two interviewees)	Total (20 interviewees)
Guidance and support from health authorities; leadership attention	Attention and support from managers	15	5	1	21
Goal alignment between employees and managers; effective execution by ordinary employees; responsibility for the organizational structure of the "National Appraisal"; establishment of a team to facilitate the "National Appraisal"; and implementation of detailed indicators by middle managers	The ability to execute orders	7	4	0	11
Financial support from the government; information technology support; more developed information technology; and the need to attract talents	Resource input	7	2	1	10
Resource allocation and adjustment; regular supervision by an independent department; guidance rather than punishment; hospital differentiation; inclusion of performance appraisal; scientific management measures; use of incentives to enhance the motivation of clinicians; avoidance of too much focus on indicators at the expense of scientific management	Scientific management	3	3	2	8
The need to set up a scientific indicator system and continuously optimize it; balanced interrelationship between indicators; consideration of patients' needs; and attention to interpretation of the indicators	Optimization of indicators	4	1	1	6
Clarification of our position; understanding of the definition of indicators; understanding and recognition of the definition of indicators; the use of appraisal results	In-depth understanding of indicators	1	2	2	5
Upgraded medical technologies; improved medical staff competence through training; strengthened surgery development	Ability improvement	2	1	0	3
Total number of Level 1 codes: 31	Total number of Level 2 codes: 7				Total coding frequency: 64 times

Based on the above empirical results, the answer to RQ5.2 *(What are the main drivers of successful implementation of the "National Appraisal"?)* is as follows:

No policy can be implemented without the support of the management. Therefore, the "attention and support from managers" ranks the first. Besides, the specific people responsible for implementation should have a strong "ability to execute orders", together with "resource input", "scientific management" and "increased understanding of the indicators by those responsible for implementation" to ensure smooth implementation. Besides, it is also important to optimize the indicators based on real-time feedback.

4.3.6 The roles of health authorities in the "National Appraisal" implementation

As the initiator of the "National Appraisal", health authorities control the right to set the appraisal indicators and have the right to set the rules of medical practices and treatment. Hospital managers and clinicians, as the main executors, may face a series of challenges in the implementation process and need coordination and support from health authorities to find solutions.

The interview results show that hospitals need health authorities to implement "differentiated criteria for the establishment of new specialties to optimize the competitive landscape" the most.

For example, *"[H]ealth authorities, as policymakers in the healthcare sector, need to guide hospitals to develop well and improve their capabilities. They need to optimize the distribution of healthcare resources, integrate resources, optimize the structure, and allow local hospitals to differentiate from each other by differentiating the government's criteria for the establishment of new specialties"*. (Ga2)

Besides, the appraisal implementation process requires coordination from medical insurance policies.

For example, *"[I]n the oncology department, only with support in the charging standards and medical insurance policy can improvement in the 'National Appraisal' indicators be realized. Take the cost of consumables for example. Non-reimbursement or low imbursement rate under the medical insurance scheme will increase the burden of patients and thus affect the ability improvement of hospitals." (Ga3)*

Furthermore, hospital managers also need feedback on the appraisal results to guide the next step of improvement.

For example, *"[C]ompetent government authorities need to guide hospitals to improve specific areas of weakness and address existing problems, provide timely feedback on indicator*

appraisal results, make public details of the indicators of hospitals at the same level, understand the competitors, and perform benchmarking analysis. They should not just focus on the appraisal rankings." (Ga5)

At present, health authorities have not made full use of this batch of collected data to guide hospital development.

"We still have not received feedback on the data collected in 2020." (Ga5)

As a result, some hospital managers believe that health authorities have failed to play their specific roles in the appraisal.

For example, *"[L]ocal governments have not played any specific role. They basically do not pay attention to how hospitals can improve the 'National Appraisal' indicators." (Qa1)*

Some interviewees also mentioned the need for more consideration of clinicians' opinions in the development of policies, which is consistent with the feedback from clinicians presented in Table 4.9. See Table 4.10.

Table 4.10 The role government authorities should assume in the implementation of the "National Appraisal"

Level 1 codes	Level 2 codes	Hospital managers (ten interviewees)	Representatives of health authorities (two interviewees)	Total (12 interviewees)
Optimization of the competitive landscape; establishment of new specialties to ensure differentiation of hospitals; criteria for the introduction of new technologies and new projects; balanced distribution of medical resources; and functional positioning of hospitals	Differentiated criteria for the establishment of new specialties to optimize the competitive landscape	5	4	9
The need to develop policies to retain patients; adjustment of the reimbursement ratios for hospitals at different levels; improvement of the charging standards; medical insurance coverage of consumables costs; expansion of oncology drug coverage; clear positioning of medical insurance; and policy support from medical insurance	Need for coordination from medical insurance policies to facilitate the implementation of the appraisal indicators	7	1	8

Level 1 codes	Level 2 codes	Hospital managers (ten interviewees)	Representatives of health authorities (two interviewees)	Total (12 interviewees)
departments				
Timely feedback on indicator appraisal results; guidance on hospital development based on data; guiding hospital development; development of indicator reference values based on local competitors; and facilitation of the application of performance appraisal results	Timely feedback and guidance on appraisal results	7	1	8
The need to provide financial support for hospitals; clarity on the non-profit nature; clarity on the public interest orientation	Provision of financial support	6	0	6
Insufficient attention to hospitals; no tangible representation of the current role	No tangible representation of the current role	4	0	4
The need for reduced financial restrictions; difficulty to increase revenue without increase in hospital size; hindered sustainable development due to a high percentage of personnel expenses	The need for reduced financial restrictions	4	0	4
Increased consultations with clinical professionals; more considerations of hospital realities in policy development	More consideration of clinicians' professional opinions when formulating policies	2	0	2
Total number of Level 1 codes: 32	Total number of Level 2 codes: 7			Total coding frequency: 41 times

4.3.7 Suggestions for improving performance appraisal indicators

Suggestions for improving the indicators mainly focus on the adaptability of existing indicators. Interviewees generally expressed that it is not reasonable to use the same set of indicators for performance appraisal at different hospitals. Instead, the performance appraisals of different

hospitals should be differentiated by local development status, size of local population, the administrative division levels of their locations, and other relevant factors.

For example, *"[I]t is not appropriate to adopt a unified set of indicators. Appraisal of hospitals should be differentiated by classification and the administrative division levels of their locations while factoring in demographic and economic factors. For example, when you evaluate a person, if he/she is a talent at the municipal/provincial/national level, you should compare him/her with his/her counterparts at the respective levels."* (Ca5)

Alternatively, different weights should be assigned to different indicators when assessing hospitals at different levels of development.

"It is easy for hospitals under the provincial health commissions or the Ministry of Health to meet most indicators. But it is difficult for hospitals in prefecture-level cities and counties to meet the same requirements. Therefore, different weights should be considered." (Ca7)

Besides, prefecture-level hospitals should pay more attention to clinical care and reduce the weight of scientific research.

For example, *"[F]or non-university-affiliated prefecture-level urban hospitals, clinical indicators should be emphasized because they do not have many opportunities to undertake teaching and research tasks."* (Ga2)

Meanwhile, the objectivity of the indicators needs to be ensured. Two managers mentioned that the "medical staff satisfaction" indicators are not objective enough and have poor traceability and should be improved.

For example, *"[P]atient and medical staff satisfaction indicators are unobjective and not traceable. Hospitals would ask clinicians to fill in high scores to improve satisfaction, especially the satisfaction of clinicians. So, the scores do not necessarily reflect their true opinions. Even if clinicians are not satisfied, they still give high scores due to the pressure from hospital leaders and consideration of the honor of the hospital." (Qa2)*

Some interviewees also suggested adding some new indicators, such as setting indicators that reflect government cooperation.

For example, *"[T]he indicators on financial input from local governments and staff settings are lacking and basically not considered. The same is true with the policy orientation of medical insurance. Nowadays, we cannot simply rely on the efforts of hospital mangers and clinicians to achieve hospital development."* (Cg1)

Indicators reflecting longitudinal changes in the hospital itself should also be added.

For example, *"[A]ttention should be paid to a hospital's achievement of indicators and the*

dynamic assessment thereof." (Cd1)

Some also mentioned adding indicators to reflect clinician's interests. See Table 4.11.

Table 4.11 Two-level codes on suggested improvements to indicators

Level 1 codes	Level 2 codes	Hospital managers (13 interviewees)	Clinicians (five interviewees)	Representatives of health authorities (two interviewees)	Total (20 interviewees)
Appraisal of hospitals by the administrative division levels of their locations and classification, local development status, number of Grade A tertiary hospitals in the area, and size of local population; assignment of different weights to different indicators; differentiated pricing standards for healthcare services in different provinces resulting in poor comparability; differentiated appraisal for scientific research indicators	Differentiated appraisal	19	2	2	23
A heavy focus on clinical indicators by prefectural hospitals; abandonment of higher ranking in the "National Appraisal" list due to a large gap from the requirements for some indicators; weak scientific research; reduced weight of indicators related to scientific research or Level 4 surgery for prefectural hospitals; reduced weight of scientific research	Increased weight of clinical indicators and decreased weight of scientific research indicators	13	1	0	14
Extraction of more indicators from the information system to ensure authenticity and traceability; unobjective satisfaction indicators; and assignment of high scores by clinicians due to administrative pressure	Establishment of more objective indictors extracted from the information system	4	0	0	4
Increased government input; the need for guidance and cooperation from medical insurance policy; and lack of indicators for government financial input	Establishment of indicators reflecting support from health authorities	1	0	2	3
Good reasonability compared with its own performance in the previous years; increased longitudinal assessment provided by the hospital itself; dynamic appraisal based on the achievement of indicators in previous years	Addition of indicator(s) reflecting longitudinal changes	1	1	1	3
Too low fees charged for nursing items; the need to	Greater alignment	0	2	0	2

Level 1 codes	Level 2 codes	Hospital managers (13 interviewees)	Clinicians (five interviewees)	Representatives of health authorities (two interviewees)	Total (20 interviewees)
align indicators with the need for quality clinical care	between indicators and clinical needs				
Addition of indicators reflecting the interests of clinicians; addition of indicators reflecting pastoral care for clinicians	Addition of indicators reflecting the interests of clinicians	1	0	1	2
Continuous requirement of indicators to reflect the interests of doctors and patients; reasonable range for each indicator	Reasonable range for each indicator	2	0	0	2
Addition of indicator(s) to control scale expansion	Addition of indicator(s) to control scale expansion	0	0	1	1
Establishment of a feedback mechanism for indicators	Establishment of a feedback mechanism for indicators	0	1	0	1
Total number of Level 1 codes: 30	Total number of Level 2 codes: 10				Total coding frequency: 55 times

Based on the above results, the answer to the second sub-question of RQ4 (*What key appraisal indicators need to be added and improved?*) is as follows:

The feedback provided by most interviewees is the hope of diversified appraisal because hospitals at different levels and in different places are faced with different situations, undermining the applicability of one set of indicators; they also mentioned the need for reduced weight assigned to scientific research; clinicians hoped that clinical needs be taken into account when setting indicators and greater say be granted to clinicians; officials from health authorities pointed out the lack of a sense of engagement and hoped that indicators(s) reflecting the degree of coordination from health authorities be added.

4.3.8 Other feedback related to the specific situations of the sample hospitals

"Number of referrals to lower-level hospitals" is the only indicator in the "National Appraisal" that experts deem to be most relevant to relevant health authorities. It reflects the determination of health authorities to implement hierarchical diagnosis and treatment. However, this indicator has not been well implemented in CZ Hospital and GZ Hospital. During the interviews, managers of two sample hospitals also shared their views on this indicator and the dilemma facing them.

First, the most important reason is that transferring patients to lower-level hospitals produces a significant impact on the normal operation of the hospital. Hospital managers must first ensure the survival of the hospital before they can effectively implement the policies. Therefore, they do not have enough motivation to implement the indicator.

For example, *"[I]n prefecture-level hospitals like our hospital, if we only treat major diseases, our business and economic indicators will obviously be jeopardized. In this context, how can hospital managers fulfill this indicator on referrals to lower-level hospitals at the cost of the more critical indicators? The answer lies in operation and efficiency. We need to choose the lesser of two evils." (Ca1)*

Second, the government has not set an indicator on the number of referrals to higher-level hospitals. The policy has been advocating that "major diseases should be treated within the county". Besides, as township hospitals have improved their healthcare services, they are unwilling to transfer patients to higher-level hospitals. As a result, prefecture-level hospitals can only serve the patients in the urban center, which has affected their operation. Meanwhile, the competition among medical consortiums to transfer patients to higher-level hospitals also becomes fierce.

For example, *"[H]ierarchical diagnosis and treatment is currently one-way. There is no*

requirement for referrals to higher-level hospitals, which is unreasonable. There should be not only indicators for referrals to lower-level hospitals but also indicators for referrals to higher-level hospitals. County-level hospitals now have improved conditions and adequate equipment. But in recent years, the number of patients transferred to higher-level hospitals has decreased instead of increased. The central government has been vigorously supporting the development of county-level hospitals in recent years. Some large hospitals are even transferring patients to county-level hospitals." (Ga2)

Third, there are other reasons such as lack of software system support for referrals, poor information sharing, and the absence of relevant statistics, all which undermine the motivation of doctors to recommend referrals; meanwhile, the willingness of patients to be transferred to lower-level hospitals is also low. They prefer to get better treatment in higher-level hospitals.

In addition, CZ Hospital is also confronted with the difficulty of increasing the proportion of income from healthcare services. During interviews, its hospital managers also talked about this problem. They particularly mentioned that increasing the number of high-level surgeries is the main solution to increasing the proportion of income from healthcare services. However, high-level surgeries also require more expensive equipment and consumables and entail more tests and examinations. The positive associations among the costs of various items/services have led to increased income from medical services, but its proportion out of the total income can hardly be increased. Further increases in the expenses of healthcare services are not feasible due to limitations on the payment according to the types of diseases and increases in medical expenses will add more burden to patients.

For example, *"[A]s more consumables are consumed for advanced, high-precision and cutting-edge surgeries and some new technologies, the proportion of consumables may increase as a result. Hospitals are subject to a lot of restrictions, and the indicators are interrelated. While performing advanced, high-precision and cutting-edge surgeries and applying new technologies, more consumables are needed, leading to a higher proportion of the cost of consumables. The hospital has taken many ways to control the use of some non-essential drugs and consumables, such as the auxiliary drugs and auxiliary consumables that fall into the targets key monitoring. However, with the increase in the proportion of surgeries, interventional and implantable consumables are increasing, which is very difficult to control."* (Ca2). See Table 4.12 for details.

Table 4.12 Two-level codes on the feedback on the specificity of the sample hospitals

Level 1 codes	Level 2 codes	Frequency
Open codes on the dilemma to transfer patients to lower-tier hospitals		
Abandonment of these indicators; protection of business and economic indicators; reluctance to transfer patients to lower-level hospitals to ensure the survival and profitability of the hospital	Referrals to lower-level hospital affecting hospital operation	8
Failure to realize hierarchical diagnosis and treatment; ability to serve patients in the central urban area only; the need for township hospitals to set indicators for referrals to higher-level hospitals; reluctance of county-level hospitals to transfer patients to higher-level hospitals due to their own improved treatment capacity; fierce competition among township medical consortiums for referrals of patients to higher-level hospitals	Lack of referrals to higher-level hospitals	7
Poor interoperability between information systems; lack of a sophisticated referral network	Inadequate software support	7
Inconsistent understanding of the referral criteria; unclear definition of patients qualified for referrals to lower-level hospitals; and denial of the significance of indicators	Insufficient understanding of indicators	5
The possibility for patients to access better treatment options if transferred to higher-level hospitals; lack of primary care resources; and reluctance of patients to be transferred to lower-level hospitals	Referrals to lower-level hospitals undermining patients' interests	4
Open codes on the dilemma to increase the proportion of income from healthcare services		
High cost of drugs and consumables for high-level surgeries		11
Restriction on the increase in the proportion of income from healthcare services due to the positive associations among different sources of income		7
High income from healthcare services for high-level surgeries		3
A higher number of surgeries		2
Limited income resulting from payment according to the types of diseases		2
Increased tests and examinations		2
Treatment through minor surgeries at a loss		1
Small amount covered in the medical insurance scheme for surgeries performed in small cities		1
Low fees charged due to the inability to charge some items		1
Low percentage of medical insurance coverage		1

4.3.9 The patient's experience of medical treatment

A total of 13 patients from the three sample hospitals were interviewed, and the keywords mentioned by the interviewees were mainly focused on convenience, expenses, and quality of healthcare services. First, the most important reason for them to visit a prefecture-level hospital

is the high degree of convenience, with the frequency of "convenient and easy to see a doctor" being 9, "short waiting time" being 6, and "long waiting time" being 2. As to expenses, the frequency of "reduced expenses" is 7, "no significant change in expenses" 2, "high reimbursement ratio" 2, and "high expenses" 1. Regarding quality of healthcare services, the frequency of "good medical technologies" is 7, "advanced equipment" 3, and "passable medical technologies" 1.

4.4 Summary of qualitative research results

Based on the above results, the five research questions can be answered, together with a profound analysis of the positive influences of the implementation of the "National Appraisal" on tertiary hospitals in China. Besides, the problems of the current appraisal system are identified, and stakeholders' suggestions on the appraisal indicators put forward, as detailed in Table 4.13.

Table 4.13 Summary of research results

Research questions	Section	Summary of results
RQ1: Who are the key stakeholders of tertiary public hospitals? To what extent are the "National Appraisal" indicators related to these key stakeholders? Are the demands of the key stakeholders balanced and taken into due account?	4.1.1, 4.1.2	Four key stakeholders are identified: hospital managers, clinicians, patients, and health authorities. Of the 31 core appraisal indicators, 15 are most relevant to the interests of hospital managers, 11 the interests of patients, four the interests of clinicians, and only one the interests of health authorities.
RQ2: How should the key indicators of the "National Appraisal" be categorized into the four dimensions of the balanced scorecard?	4.1.2	The financial dimension consists of six indicators, all of which are most relevant to the interests of hospital managers; the customer dimension encompasses eight indicators, all of which are most relevant to the interests of patients; the internal business process dimension is composed of 12 indicators, of which six are most relevant to hospital managers, two to clinicians, three to patients, and one to health authorities; and the learning and growth dimension is measured by five indicators, of which three are most relevant to hospital managers and two to clinicians.
RQ3: What benefits and positive changes has the implementation of the "National Appraisal" brought to the key stakeholders?	4.3.3	The "National Appraisal" has clarified the direction for improvement and development orientation for each hospital, reflected in improved healthcare services, enhanced operational effectiveness, greater discipline development, and better management.
RQ4: What are the challenges faced by tertiary public hospitals at the prefecture level in the implementation of the "National Appraisal"? What key appraisal	4.3.1, 4.3.4, 4.3.7	On the one hand, implementation of the indicators positive guidance is difficult and requires support from various parties such as funding, talents and policies; on the other hand, in the destruction and reconstruction of the old order, the indicators will

Research questions	Section	Summary of results
indicators need to be added and improved?		affect the vested interests of various players in the implementation process, rendering continued advancement difficult. Therefore, it is necessary to give more consideration to the interests of the supply side of healthcare services on the one hand and to strengthen the responsibility of health authorities in performance appraisal on the other hand. It is hoped that classified appraisal be implemented, less weight assigned to scientific research, clinical needs taken into account in the development of indicators, clinicians granted greater say, and indicators reflecting the degree of cooperation of health authorities added.
RQ5.1: How should the "National Appraisal" indicators be aligned with hospitals' organizational strategy and be implemented?	4.3.2	Each sample hospital has an independent department responsible for implementing performance appraisal. The balanced scorecard is adopted to assign appraisal indicators to the corresponding functional department, which will communicate with the department director and finally assign the applicable indicators to finance, clinical and other departments for implementation in their daily work.
RQ5.2: What are the main drivers of successful implementation of the "National Appraisal"?	4.3.5	The primary driver is "attention and support from management". On this basis, the specific responsible persons need to have a strong ability to execute orders. "Resource input" and "scientific management" are also indispensable. In addition, people responsible for implementation need to develop "an-depth understanding of the treatment" to ensure the smooth implementation.

Meanwhile, the research results are summarized from the perspectives of stakeholder theory and the balanced scorecard, leading to the following model (Figure 4.4) depicting the "National Appraisal".

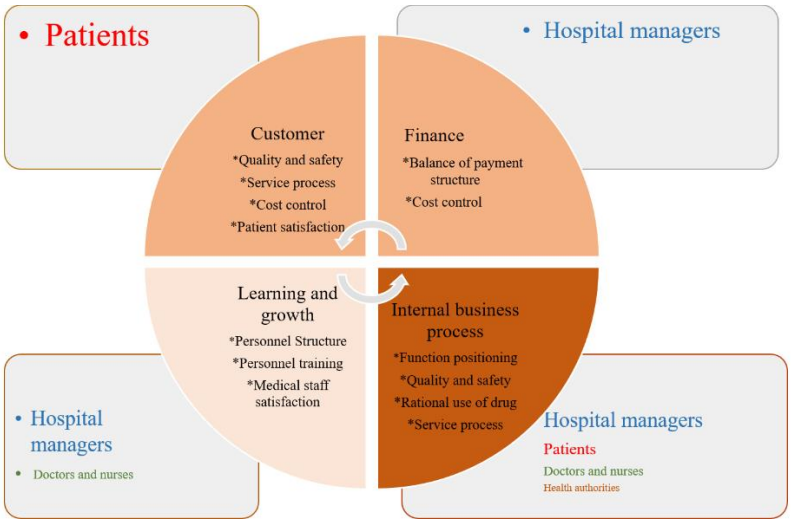


Figure 4.4 Stakeholder-based performance appraisal model from the perspective of the balanced scorecard

Chapter 5: Discussion and Conclusions

This chapter provides an overview of the empirical findings, develops further discussion on the research questions in relation to the findings, presents relevant implications and recommendations for policymakers and hospital managers, and finally draws conclusions and points out the limitations and suggestions for further research.

5.1 An overview of research findings

Guided by stakeholder theory and the balanced scorecard, this study explored China's "Performance Appraisal System" of tertiary public hospitals and its implementation effects with a mixed design combining both quantitative and qualitative methods. Specifically, the Delphi method was used to identify the key stakeholders of Chinese public hospitals and to relate the key indicators of the "National Appraisal" to those stakeholders; next, the archival data on the performance appraisal of the three sample hospitals during a three-year period were analyzed to understand the implementation effect of the "National Appraisal"; and lastly, qualitative data collected from semi-structured interviews with the key stakeholders of the said sample hospitals were analyzed to obtain the final research results.

Results of the Delphi expert consultations revealed the following findings: The key stakeholders of public hospitals include hospital managers, clinicians, patients, and health authorities. Both the quantitative data analysis and interview results of the sample hospitals indicate that the "National Appraisal" has gradually brought its "baton" role into play after three years of implementation. It has effectively guided public hospitals to implement their functional positioning and strongly pushed public hospital managers to strengthen scientific management reflected in their gradual shift of attention from ranking results to how to improve hospital internal management. Specific manifestations include improvement in multiple aspects such as healthcare quality and safety, rational use of drugs and information technology development; meanwhile, some of the appraisal indicators are not in line with the development of hospitals, which brings confusion and challenges to hospital managers as well as clinicians. For example, due to the huge expenditure on human and financial resources necessitated by the three-year COVID-19 pandemic prevention and control, many hospitals are now faced with a negative balance of income and expenditure and struggle to make ends meet.

Due to the imbalance in the urban development of cities, tertiary public hospitals also differ significantly in their level of development. This is particularly true in the area of scientific research. Compared to university-affiliated hospitals, prefecture-level hospitals as the "middle layer of the sandwich" have difficulties in both the introduction of scientific researchers and the access to scientific research funds, and this problem is not easy to solve. The appraisal will fail to serve as a benchmark and provide effective references if the same scientific research appraisal indicators are applied to measure tertiary public hospitals in different regions. In addition, this study also finds that the appraisal indicator system focuses heavily on indicators related to hospital managers and patients, while the indicators related to the sense of fulfillment and interests of clinicians are limited.

This study is one of the first empirical studies combining quantitative and qualitative methods to evaluate the implementation effects of the "National Appraisal" in Chinese tertiary public hospitals from multiple perspectives. The data on the performance of the appraisal indicators in several hospitals and interviews with key stakeholders of the sample hospitals were analyzed to ensure the authenticity and objectivity of the research results. The results can provide references for health authorities to further optimize performance appraisal indicators, provide hospital managers with more scientific and effective management methods and tools to strengthen internal management, and contribute to the sustainable development of the "National Appraisal" in a better direction for the ultimate benefit of patients.

5.2 Discussion

5.2.1 Key stakeholders of public hospitals and the relevance of appraisal indicators

Discussion 1: Identification of the key stakeholders of tertiary public hospitals, the relevance of the key indicators of the "National Appraisal" to the key stakeholders, and whether the "National Appraisal" has balanced the interests and needs of all key stakeholders

The key stakeholders are most closely related to an organization, including shareholders, managers and employees (H. H. Chen, 2003). The government is the shareholder of public hospitals. It needs to bring into play its investor role by providing financial support to public hospitals on the one hand and acts as a regulator by formulating relevant policies and establishing monitoring, appraisal as well as reward and punishment mechanisms on the other hand. Hospital managers, as leaders of the hospital, largely influence the operation and sustainable development of the whole hospital (Y. L. Zhao, 2005). The main managers include

the hospital president, vice president(s), party secretary, deputy party secretary, and department directors, who organize and coordinate the hospital's human and financial resources. Clinicians are the direct providers of healthcare services. Their medical practices directly affect the quality and efficiency of healthcare services, reflecting the core competitiveness of public hospitals (Fan, 2017). Patients are the demand side of healthcare services, service recipients of the healthcare system, payers of medical expenses, and very important guarantors of hospitals' income. Given the crucial role they play in the survival and development of public hospitals, they are rightfully key stakeholders of public hospitals.

Based on literature review and the Delphi method, this study identifies the key stakeholders of public hospitals to be patients, hospital managers, clinicians, health authorities, and the public according to the scores assigned by experts to the consistency of stakeholders, as shown in Table 4.1. Some Chinese scholars have used the "Mitchell score-based approach" to define public hospital stakeholders in terms of three attributes: legitimacy, urgency and power. For example, Cheng et al. (2015) adopted the approach and identified public hospital stakeholders to be government, hospital staff and patients. Similarly, Liu (2018) comprehensively analyzed and classified 17 types of public hospital stakeholders based on the Mitchell score-based approach. The results showed that the government, hospital staff and patients are definite stakeholders. The identification of key stakeholders of public hospitals in this study is basically the same as that by Cheng et al. (2015) and Liu (2018) using the Mitchell score-based approach. Nevertheless, this study argues that hospitals and hospital employees should mainly include hospital managers as well as clinicians and should not be generalized into one type. This is the difference in the identification of key stakeholders of public hospitals in this study.

The roles and responsibilities of different stakeholders differ in the implementation of the "National Appraisal". Internal employees are considered the most important influences on organizational performance (Bowen & Ostroff, 2004). Hospital managers and clinicians are directly involved in and implement the "National Appraisal" and thus directly influence performance appraisal results. Top hospital managers can influence other stakeholders by allocating resources, introducing incentives, and establishing reward and punishment mechanisms. Functional department managers collect and monitor data on the "National Appraisal" indicators on a daily basis and give timely feedback.

This study reveals that the number of "National Appraisal" indicators related to hospital managers is the largest, accounting for 48.4%. Interviewees from the sample hospitals believe that hospital managers are responsible for more than 60% of the implementation effect of the "National Appraisal" and play a pivotal role. However, results of the "National Appraisal" need

not only the attention of the hospital management but also the active participation of all clinicians. It can only be thoroughly implemented through the daily work of all clinicians in clinical departments, medical laboratories and other departments (Delaney & Huselid, 1996). The results of Delphi expert consultations of this study suggest that only 12.9% of the "National Appraisal" indicators reflect the interests of clinicians, showing that the "National Appraisal" neglects the interests of clinicians and fails to fully mobilize their initiative and enthusiasm. If clinicians are not given a strong sense of participation in the "National Appraisal" and think that the results of hospital appraisal are only a matter of concern for hospital managers, the efficiency of hospital performance management will be directly reduced as a result, and it will be difficult for hospitals to obtain competitive performance appraisal results. The interests of clinicians tend to be reflected in higher income, reasonable workload, more social respect, and better career development (Nong et al., 2014). Therefore, the "National Appraisal" should place greater emphasis on the sense of fulfillment, salary packages and career development of clinicians in addition to a stricter code of conduct.

This study also finds that the "National Appraisal" is highly associated with patients. Public hospitals need to provide patients with high-quality, efficient and convenient healthcare services. It is found that 11 indicators (35.5%) in the "National Appraisal" are directly related to patients' interests, including indicators related to quality and safety, service process, cost control, and patient satisfaction. This fully demonstrates that the "National Appraisal" actively guides public hospitals to put patients at the center of healthcare and give priority to meeting patients' needs. Results of the Delphi expert consultations show that zero indicator is most relevant to the public, which refer to social residents and the ecological environment in this context. This is because experts classified the indicators related to the public into the patient category.

Health authorities, as the competent authorities of medical institutions, are one type of key stakeholders of public hospitals and are responsible for balancing the interests of both the supply and the demand sides. An analysis of the "National Appraisal" shows that the number of indicators directly related to the government accounts for only 3.2%, suggesting that the "National Appraisal" does not highlight the role of health authorities at all levels, which are marginalized. Health authorities are healthcare policymakers. To draw an analogy, if the central government is compared to a "headmaster", then local governments are "head teachers", and hospitals are "students". Whether students can get high marks in examinations depend on their own efforts, the teaching management of the "head teachers" as well as the "headmaster's" supervision and motivation of the "head teachers". Although the "National Appraisal" is implemented in tertiary public hospitals, these hospitals cannot make rapid progress in

healthcare quality, hospital operation and sustainable development without the support of health authorities at all levels. Hence, the role of health authorities in the appraisal should be reflected and highlighted.

In summary, the "National Appraisal" needs to put patients at the center of healthcare to ensure that patients can enjoy quality, efficient and convenient healthcare services under the premise of meeting the needs of different stakeholders as much as possible and balancing the interests of the government, hospital managers, clinicians, patients, and other parties (X. Liu, 2018).

5.2.2 The "National Appraisal" viewed from the perspective of the balanced scorecard

Discussion 2: Categorizing the "National Appraisal" indicators into the four dimensions of the balanced scorecard

As an effective tool for performance appraisal, the balanced scorecard measures organizational performance in four causal dimensions: customer, internal business process, learning and growth, and financial, and has had a significant impact on hospital performance management. In this study, hospital management experts were invited to categorize the key indicators of the "National Appraisal" into the four dimensions of the balanced scorecard. The details are as follows:

(1) The financial dimension captures the operational efficiency of a hospital, reflects its revenue and expenditure structure, cost control and liabilities, and determines its sustainability. Results of the Delphi expert consultations in this study show that six of the 31 key indicators of the "National Appraisal" are most relevant to the financial dimension, accounting for 19.3% of the total number of indicators. They are respectively Indicator 35 (balance of income and expenditure▲), Indicator 36 (asset-liability ratio▲), Indicator 37 (medical income growth rate), Indicator 31 (proportion of medical service revenue (excluding drugs, consumables, examination and testing revenue) to medical revenue), Indicator 34 (energy consumption expenditure per ten thousand yuan of income▲), and Indicator 33 (proportion of personnel expenditure to business expenditure▲). Public hospitals are non-profit organizations. The "National Appraisal" needs to guide them to return to public interest orientation and live up to their functional positioning. Meanwhile, public hospitals need to maintain normal operation and achieve a balance between social and economic benefits to provide healthcare services to patients in a sustainable manner. Therefore, the "National Appraisal" should not encompass too many financial indicators, and 19.3% is a reasonable percentage. This study also finds that the main stakeholders related to the financial dimension are hospital managers, who are primarily

responsible for hospitals' financial operation efficiency.

(2) The customer dimension mainly reflects the interests of hospital patients. This study finds that eight of the 31 key indicators of the "National Appraisal" are most relevant to the customer dimension, accounting for 25.8% of the total number of indicators. The specific indicators include Indicator 22 (average outpatient appointment rate), Indicator 23 (average waiting time for an outpatient visit after the appointment), Indicator 38 (rate of increase in outpatients' medical expense per visit▲), Indicator 39 (rate of increase in outpatients' medication expense per visit ▲), Indicator 40 (rate of increase in average medical expense per inpatient ▲), Indicator 41 (rate of increase in average medication expense per inpatient▲), Indicator 53 (outpatient satisfaction ▲), and Indicator 54 (inpatient satisfaction ▲). Patients are the demand side of healthcare service. They not only need to access timely, accurate and effective treatment but also care about such aspects as medical expenses, treatment effect, diagnosis and treatment process and environment, and pastoral care. The "National Appraisal" should evaluate the performance of tertiary public hospitals from the demand side and set indicators related to the satisfaction of outpatients and inpatients.

(3) The internal business process dimension mainly reflects the quality of healthcare services. Results of the Delphi expert consultations in this study show that 12 of the 31 key indicators of the "National Appraisal" are most relevant to the internal business process dimension, accounting for 38.7% of the number of indicators, representing is the highest percentage. The four key stakeholders of public hospitals all have indicators corresponding to the internal business process dimension, which fully indicates that optimization of the internal business process is highly relevant to the interests of all parties. The indicators reflecting healthcare quality and safety include: Indicator 8 (incidence of postoperative complications ▲), Indicator 9 (surgical site infection rate of aseptic operations ▲), Indicator 10 (single disease quality control ▲), Indicator 13 (the number of clinical test items that have passed the national external quality assessment ▲), and Indicator 14 (mortality rate of cases in the low-risk group ▲); the indicators reflecting the functional positioning of tertiary public hospitals include: Indicator 2 (number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations)), Indicator 4 (proportion of discharged patients who underwent a surgery ▲), Indicator 5 (proportion of discharged patients who underwent a minimally invasive surgery ▲), and Indicator 6 (proportion of discharged patients who underwent a Level 4 surgery ▲); the indicator reflecting rational use of drugs is Indicator 17 (Defined daily dose (DDDs) ▲); the indicator reflecting hospital information technology development is Indicator 24 (function application level of the electronic medical record ▲); and the indicator reflecting the work

intensity of clinicians is Indicator 25 (number of inpatients per doctor per day).

Meanwhile, this study finds that only one indicator in the internal business process dimension (number of referrals to lower-level hospitals) is closely related to health authorities. Public hospitals are not-for-profit public institutions invested by the government, and health authorities are managers and funders, which delegate operational autonomy to hospitals. In principle, the government does not directly interfere with the management of specific hospital affairs. To better assist hospital managers in optimizing the internal business process, clarify the boundaries of authority and responsibility of health authorities, and give full play to the supervision and management functions of health authorities, it is necessary to set up a feedback mechanism between hospitals and local governments and to add certain appraisal indicators on the degree of cooperation of local governments, such as "internal business process" indicators related to health authorities. This will be more conducive to the implementation of the "National Appraisal" and advance the reform of public hospitals in the true sense.

(4) The learning and growth dimension reflects a hospital's staff structure, talent training, discipline development, and medical staff satisfaction and is the hospital's ability to realize and motivation for sustainable development. This dimension consists of five indicators. Results of the Delphi expert consultations in this study show that five of the 31 key indicators of the "National Appraisal" are most relevant to the learning and growth dimension, accounting for 16.1% of the total number of indicators. Specifically, two indicators reflect talent training and medical staff satisfaction, which are Indicator 48 (the pass rate of hospital residents taking the Qualification Examination for Doctors for the first time) and Indicator 55 (medical staff satisfaction ▲), and the other three indicators reflect personnel structure and discipline development, namely Indicator 45 (the proportions of anesthesiologists, pediatricians, intensive care specialists, pathologists and TCM practitioners ▲), Indicator 46 (doctor-nurse ratio ▲) and Indicator 50 (fund for scientific research projects per 100 health technicians ▲). Overall, the indicators focusing on the interests of clinicians in the learning and growth dimension are relatively limited.

In summary, the experts categorized the key indicators of the "National Appraisal" into the four dimensions of the balanced scorecard. The results suggest that the number of indicators related to the internal business process dimension is the largest, followed by the number of indicators related to the customer dimension. Most of the indicators in the internal business process dimension are related to healthcare quality, which concerns each type of key stakeholders of hospitals. However, there is a lack of indicators to reflect the role of health authorities in the optimization of the internal business process. The indicators of the customer

dimension mainly focus on patients' needs and interests; the number of indicators of the financial dimension is relatively reasonable, which is in line with the government's requirement for public hospitals to achieve a balanced income and expenditure and a slight surplus; the indicators of the learning and growth dimension focus relatively less on the interests of clinicians.

5.2.3 Positive changes brought to the key stakeholders by the "National Appraisal"

Discussion 3: Positive changes brought to tertiary public hospitals by the implementation of the "National Appraisal"

The reform process of public hospital performance appraisal is a dynamic process of balance and gaming between stakeholders (Qin, 2020). As an important healthcare reform policy, the "National Appraisal" is bound to bring some positive changes to the key stakeholders of hospitals. The results of semi-structured interviews in this study indicate that implementation of the "National Appraisal" has brought about the following positive changes to the key stakeholders of hospitals.

(1) The "baton" role of the "National Appraisal" has been brought into play. The health authorities mainly supervise the implementation of the performance appraisal policies and provide feedback on the performance appraisal results. They are the "referee" in the implementation of the "National Appraisal". Currently, the distribution of high-quality healthcare resources is unreasonable; the capacity of primary healthcare services is weak; and patients flock to tertiary hospitals for treatment. In response, the government hopes to implement the "hierarchical diagnosis and treatment" system to reasonably channel patients to different levels of hospitals. The main purpose is to facilitate the implementation of the functional positioning of public hospitals at different levels to ensure the public interest orientation of public hospitals. To guide tertiary public hospitals to focus on patients with intractable and severe diseases, the government has set performance appraisal indicators related to functional positioning, such as Indicator 4 (proportion of discharged patients who underwent a surgery), Indicator 5 (proportion of discharged patients who underwent a minimally invasive surgery) and Indicator 6 (proportion of discharged patients who underwent a Level 4 surgery). These indicators have played a very positive role in guiding hospitals to implement functional positioning, optimizing the types of diseases to be treated, adjusting internal structure, and forcing hospitals to continuously develop and improve their treatment capacity and medical technology.

(2) The "National Appraisal" has facilitated the transformation from extensive management

to lean management and from performance appraisal to performance management. Hospital managers are the main implementers of the "National Appraisal", and the implementation of the "National Appraisal" has enabled hospital managers to realize that performance appraisal must be used as an effective means. In terms of process management, many hospitals have established performance appraisal offices to be specifically responsible for specific work coordination, interpretation of appraisal indicators, data filling, data quality control, analysis of performance appraisal results, development of continuous improvement strategies around appraisal indicators, and direct reporting of relevant work progress to the president. In terms of information technology development, hospital managers have begun to advance and improve information technology development through the application of electronic medical records, providing accurate data to support the hospital's performance appraisal and business decisions. The focus on the effective application of healthcare data can help realize data-driven decision making. As to discipline development and talent team building, hospital managers recognize that discipline development is crucial for hospital development, determines healthcare quality and advancement of medical technologies, and is an important guarantee for introducing and training high-level talents (Song et al., 2017). Without an excellent team of talents, it will be difficult to achieve major progress in discipline development. In other words, talent team building and discipline development complement each other.

(3) The "National Appraisal" has been effective in regulating the treatment behavior of clinicians, improving the relationship between doctors and patients, ensuring healthcare quality and safety, popularizing rational drug use, and ensuring the accurate completion of the first page of medical records. For example, the indicators on rational use of drugs ultimately need to be implemented by clinicians. There are nine Level 2 indicators related to rational use of drugs in the "National Appraisal". Since the implementation of the "National Appraisal", hospitals have taken active measures to standardize the drug catalog, carry out training on rational use of drugs, review special prescriptions, and improve the management system on rational use of drugs. Major improvements have been made in DDDs. For example, seven of the 26 indicators monitored by the state government come directly from the data on the first page of the medical records, prompting clinicians to standardize the information related to diagnosis and treatment on the first page of the medical records to ensure the accuracy of the data on the first page of medical records and control the quality of the source of data.

(4) Patients are the main beneficiaries of the implementation of the "National Appraisal". Patients are the purchasers of healthcare services, and their interests are directly affected by the behavior of the three types of key stakeholders, namely government, hospital managers as well

as clinicians, and they directly experience the effect of the "National Appraisal" implementation. The "National Appraisal" focuses on evaluating the performance of tertiary public hospitals from the demand side and therefore consists of many indicators related to patients' needs. These indicators serve to guide hospitals to be patient-centered, enhance treatment efficiency, establish a good communication mechanism between doctors and patients, and improve patient satisfaction.

5.2.4 Challenges in implementation in prefecture-level cities

Discussion 4: Challenges facing prefecture-level cities in the implementation of the "National Appraisal"

The varying levels of development of tertiary public hospitals in China have led directly to unbalanced distribution of quality healthcare resources. Tertiary hospitals at the prefecture level are "the middle layer of the sandwich". Above them there are hospitals under the provincial health commissions or the Ministry of Health and tertiary hospitals in provincial capitals which boast absolute advantages in terms of human and financial resources. Below them there are county-level hospitals strongly supported by the state. To guide patients to seek medical treatment in a reasonable manner, facilitate hierarchical diagnosis and treatment, and achieve the reform goal that "major diseases should be treated within the county", the level of treatment in county-level hospitals has been rapidly improved in recent years. Meanwhile, many county-level hospitals have directly established cooperative relationships with tertiary hospitals in provincial capitals, causing prefecture-level hospitals to be marginalized and hollowed out. As a result, prefecture-level hospitals are faced with major bottlenecks in financial operation, information technology development, academic research, and medical technology. The specific major challenges are as follows:

(1) The asset-liability ratio is high and insolvency serious. In recent years, the COVID-19 pandemic has had a significant impact on hospitals. On the one hand, hospitals have experienced increased cost of manpower dedicated to the pandemic prevention and control. In the peak periods of the pandemic outbreak, 22% of the staff of the sample hospitals were involved in the fight against it. On the other hand, patients avoided going to hospitals as much as possible for fear of infection, resulting in a decrease in the number of outpatients and inpatients. Besides, the government's financial subsidies were not in place in a timely manner. Under such pressure, many hospitals experienced reduced income and struggled to make ends meet. To cope with the huge challenges in financial operations, they need to rely on loans to ease the pressure of capital turnover. Hospitals need to survive and address the operational

dilemma before seeking development.

(2) The information system is underdeveloped. Electronic medical records are the foundation of information technology development. The state requires all tertiary hospitals to achieve Level 4 or higher in the function application level of the electronic medical record, realize information sharing within the hospital, and perform medical decision support function (General Office of the National Health Commission of the PRC, 2018). Most of "National Appraisal" indicators are quantitative in nature. So, it is crucial to capture authentic and accurate data on performance indicators. A good information system provides strong support for the collection of data on appraisal indicators. However, optimizing and improving the information system requires a large amount of investment. It is difficult for hospitals to invest a large amount of money to build the information system at this stage because of operational difficulties.

(3) Prefecture-level hospitals are weak in scientific research and innovation and struggle to attract talents. Due to the serious lack of talents engaged in academic research, the research projects and research funds received by prefecture-level hospitals are far less than those received by hospitals under the provincial health commissions or the Ministry of Health and university-affiliated hospitals. This is mainly a result of the difficulty to recruit researchers in prefecture-level cities as discipline leaders and top-notch researchers prefer to stay in large hospitals in first-tier cities and are unwilling to work in prefecture-level hospitals. Besides, prefecture-level hospitals are not supported by universities and thus face huge difficulties in improving research and teaching performance.

(4) Some of the "National Appraisal" indicators conflict with the choice of treatment options and the development of new medical technologies. For example, when doctors can choose either drug treatment or surgery for patients according to clinical diagnosis, it is cheaper to choose conservative drug treatment than surgery. However, choosing drug treatment for patients will apparently increase the length of hospital stay and the proportion of rational use of drugs, which will directly cause hospitals to fail to meet the "National Appraisal" indicators and affect the bonuses of doctors and their respective departments. In this context, some clinicians will prefer surgical treatment. If clinicians need to consider whether the "National Appraisal" indicators are met when choosing treatment plans for patients, the patients' interests will be affected.

On top of that, hospitals are encouraging clinical application of new medical technologies. But the application of new medical technologies will drive up medical expenses as well as the cost of drugs and consumables, which will also affect the performance of the "National Appraisal" indicators. A case-by-case analysis needs to be carried out to strike a balance

between these conflicting indicators. Hospitals need to develop clear clinical pathways and clarify surgical indications. When developing treatment plans, they should factor in both patients' conditions and their affordability and establish a patient-centered value-based healthcare system. In addition, the development of new technologies should be encouraged. When development of new technologies leads to increased cost of drugs and supplies in certain departments, measures can be taken to lower the requirements on the relevant indicators in other departments to compensate. After all, the "National Appraisal" is aimed at assessing each hospital as a whole.

5.2.5 Horizontal and longitudinal comparisons of the sample hospitals

Discussion 5: Comparing the implementation effects of the "National Appraisal" among different prefecture-level tertiary public hospitals

In this study, data on the performance appraisal indicators of three sample hospitals located in different prefecture-level cities during the period from 2018 to 2020 were collected and analyzed to identify their trends of change. Based on the analysis of the archival data and the results of the interviews with the key stakeholders of the sample hospitals, the changes brought to hospitals by the "National Appraisal" were further analyzed from the four dimensions of the balanced scorecard.

(1) The financial dimension has many indicators most relevant to hospital managers and requires managers to regulate from the top-level design. Overall, the relevant indicators of the financial dimension of the three sample hospitals have been well regulated in accordance with the national guidance, and the indicators have been gradually adjusted from high or low to the normal range of values stipulated by the state. Significant improvements have occurred in Indicator 35 (balance of income and expenditure) and Indicator 37 (medical income growth rate), which decreased in all the three sample hospitals, keeping the hospitals in a slight surplus. This trend is in line with the state's public interest positioning of tertiary hospitals and has avoided the excessive growth of medical expenses. At the patient side, seven patients mentioned in their interviews that medical expenses had decreased, and two patients said that medical expenses had not changed significantly, which provides another source of evidence that implementation of the "National Appraisal" has indeed reduced the financial burden of patients. Indicator 33 (proportion of personnel expenditure to business expenditure) increased year by year in all the three sample hospitals, showing that hospitals have been providing better salary packages for their employees year by year, which helps to increase employee satisfaction. The financial dimension indicators, as the top dimension indicators, not only increase the

profitability of hospitals, but also indirectly regulate the interests of patients and doctors, which also highlights the importance of financial indicators to hospital managers.

(2) The indicators of the internal business process dimension are related to hospital managers, clinicians as well as health authorities. The indicators related to hospital managers, which are all related to the regulation of medical practices, are positive in all the three sample hospitals, representing a positive response to the national requirements. To clarify the functional positioning of tertiary public hospitals and implement hierarchical diagnosis and treatment, it is necessary to improve the performance of Indicator 4 (proportion of discharged patients who underwent a surgery) and Indicator 6 (proportion of discharged patients who underwent a Level 4 surgery), both of which have been significantly improved in all the three sample hospitals. Specifically, CZ Hospital and GZ Hospital both performed well, while QY Hospital was clearly at a disadvantage. The comparison once again reflects that QY Hospital suffers from a lack of target patients and clearly falls behind the other two sample hospitals in terms of the implementation of the indicators related to hierarchical diagnosis and treatment. During the interviews, managers of QY Hospital also mentioned that the lack of target patients was the main challenge faced by the hospital. This may be because QY Hospital is adjacent to the provincial capital, and some patients in need of surgery are attracted by the higher-quality medical resources in the provincial capital and are less likely to stay in the local area for treatment. This is one of the challenges faced by prefecture-level hospitals in the "National Appraisal" implementation.

The indicators in the internal business process dimension most relevant to clinicians are mainly concerned with healthcare quality. The incidence of postoperative complications (Indicator 8), surgical site infection rate of aseptic operations (Indicator 9) and the mortality rate of cases in the low-risk group (Indicator 14) well all under good control in the three sample hospitals and maintained at low levels during the evaluation period. Indicator 25 (number of inpatients per doctor per day) reflecting the work intensity of clinicians exhibited a trend of decrease in all the three sample hospitals, suggesting that the burden of physicians decreased after the appraisal. This may be related to the expansion in human resources as the interviews indicated that the hospitals had been recruiting new medical staff. GZ Hospital and CZ Hospital experienced a gradual decrease in Indicator 17 (defined daily dose (DDDs)) concerning regulation of medical practices, while QY Hospital showed a trend of increase in the said indicator. Interviews reveal that such increase is closely related to the daily management of the hospital's managers. The indicator most relevant to health authorities is the number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations). Both GZ Hospital

and QY Hospital significantly increased the number of referrals to lower-level hospitals in response to the government's requirement, while CZ Hospital, on the contrary, showed a trend of significant decrease in this indicator. This may be related to the high debt ratio of CZ Hospital and the operation pressure. Its managers also mentioned in interviews that they had to give up this indicator to ensure survival and normal operation of the hospital. Each hospital may have historical reasons for not being able to respond well to national requirements and may need reasonable regulation by local health authorities to achieve a balance between hospital operation and performance appraisal according to their own reality.

(3) The indicators related to the learning and growth dimension are mainly those concerning staff structure, talent training and discipline development. None of the three sample hospitals showed significant improvement in this dimension. In terms of staff structure, on the one hand, the lack of pediatricians and anesthesiologists is a common problem faced by Chinese hospitals at present; and on the other hand, this staff structure imbalance is even more pronounced in prefecture-level cities due to their lack of attraction to talents. This situation did not show any improvement even after the "National Appraisal" was carried out. Worse still, prefecture-level hospitals even face the possibility of talents being poached by higher-level hospitals. In terms of talent development, the indicator most relevant to clinicians is Indicator 48 (the pass rate of hospital residents taking the Qualification Examination for Doctors for the first time). Driven by the "National Appraisal", all hospitals took measures to improve the examination pass rate, such as guidance and teaching by teachers and centralized training. However, QY Hospital still performed much worse than the other two hospitals in this indicator. As to discipline development, prefecture-level hospitals face huge challenges in the access to research funds and research results. Interview results show that, on the one hand, prefecture-level hospitals have neither talent support from universities nor fund support from health authorities. So they have weak research capabilities and tend to fall into a disadvantaged position in competition with hospitals under provincial health commissions or the Ministry of Health. On the other hand, many doctors believe that the main task of prefecture-level hospitals is to provide clinical healthcare services and that scientific research is aimed at overcoming difficulties and is thus not suitable for prefecture-level hospitals that are short of talents to participate in. Because of this, many doctors are not willing to engage in scientific research. In the future, certain measures might need to be taken to encourage them to participate in large-scale research in high-level hospitals to develop research enthusiasm.

(4) The customer dimension reflects the indicators most relevant to patients and focuses on the interests and needs of patients. For example, increase in the average outpatient appointment

rate (Indicator 22) is reflected in the fact that most of the interviewees deemed the average waiting time for an outpatient visit after the appointment (Indicator 23) short; the rate of increase in various outpatient and inpatient expenses had also been controlled and reduced year by year, and patients generally thought that the medical expenses had been reduced or not increased; the satisfaction of both outpatients and inpatients had been enhanced; QY Hospital also performed worse than the other two hospitals, with a low average outpatient appointment rate, a high rate of increase in various types of expenses, and low patient satisfaction.

Overall, both CZ Hospital and GZ Hospital improved significantly in the three-year "National Appraisal" implementation period with increased patient satisfaction. This indicates that the customer dimension indicators do reflect patients' interests, and convenience of access, cost control, and healthcare quality are all well reflected in patient-related indicators. During interviews, doctors and patients also unanimously agreed that patients' interests were given high priority. In other words, the "National Appraisal" played its due role in the goal of "patient-centeredness".

5.2.6 Alignment of the "National Appraisal" indicators with strategic objectives

Discussion 6: Alignment of hospital performance appraisal indicators with the organizational strategy

The implementation of both performance appraisal and strategic objectives requires the participation of all hospital staff and interdepartmental cooperation. Therefore, the alignment of performance appraisal indicators with strategic goals is a topic worthy of exploration. In this context, it is necessary to align the key indicators of the "National Appraisal" with the strategic goals of hospitals, integrate them into the daily management of staff, translate performance appraisal into operable measurement indicators and target values, set the target value of each "National Appraisal" indicator scientifically and reasonably, and then decompose the values into annual and monthly targets to establish a performance management model oriented towards strategic goals. An organizational strategy clarifies the direction of the organization and how leaders expect to achieve organizational goals. It is composed of mission, values and vision (Kaplan, 2009). Performance appraisal out of alignment with strategic goals will become an overwhelming task over time. The balanced scorecard, as a tool for performance measurement and strategic management, effectively links performance appraisal and strategic objectives, translates an organization's mission and strategy into measurable and actionable indicators, and provides decision support for strategic objectives from four interrelated dimensions (Kaplan & Norton, 1996a).

The semi-structured interviews reveal that many employees at the sample hospitals were unable to accurately describe the strategies of their hospitals and perceived hospital strategy as a rather vague and unclear concept. A strategy can only be effectively managed provided that it is accurately described and measured (Kaplan & Norton, 2004). Therefore, it is very important for a hospital to organize frequent strategic learning and feedback sessions for its staff to emphasize the vision and goals it is trying to achieve and to ensure that employees can clearly describe the hospital strategy to ensure that individual and team goals are aligned with the organization's strategic goals. Through regular strategic learning, development of supporting incentive policies and management systems, and strengthened supervision of and feedback on the performance appraisal process, hospitals can effectively mobilize the initiative of clinicians, enhance their sense of identification with the organization, and drive them to change their daily practices to ensure that the target values of the "National Appraisal" can be achieved, which ultimately allows the organization to achieve competitive performance appraisal results. Hospitals need to have clear development orientation and translate strategic goals into daily tasks. Patients are the core of a hospital, and the staff are its foundation. Hospitals need to deliver better treatment and services to patients and ensure the well-being of employees.

5.2.7 Main drivers of successful implementation of the "National Appraisal"

Discussion 7: Main drivers of successful implementation of the "National Appraisal"

Results of the analysis of semi-structured interviews show that the main drivers of successful implementation of the "National Appraisal" are as follows:

(1) Hospital managers attach great importance to performance appraisal and regard it as a strategy. Performance appraisal is a top priority for a hospital, and the president is ultimately responsible for reviewing the data of the performance appraisal system. Implementation of the "National Appraisal" requires the unified and coordinated work of multiple departments, which shall be guided by strategic goals, leverage the sophisticated system to orderly deploy and implement specific work, designate relevant departments to train staff and interpret the definitions of appraisal indicators, data sources and collection, set the target values of appraisal indicators in lights of the current situation and strategies of the hospital, and clarify the responsible persons for regular supervision and implementation. Only when the top leaders of the hospital pay attention to and personally participate in optimizing the top-level design will the managers of other departments at all levels actively participate in advancing the implementation of the "National Appraisal" and make efforts to continuously optimize the performance appraisal results.

(2) The hospital information system provides strong support and enables interconnectivity and interoperability. The "National Appraisal" measures the performance of public hospitals through quantifiable indicators, which puts forward higher requirements for hospital information technology. To achieve interconnectivity and interoperability, hospital information systems need to support the effective acquisition and uploading of data from the "National Appraisal" indicators and monitor changes in the said indicators. With high-quality objective data, managers can analyze and apply the data according to the trend of changes in the data reported every year, identify the management problems behind such changes, decompose management goals into smaller actionable targets, identify gaps through data analysis and comparison, and explore solutions to fill these gaps and make decisions accordingly.

(3) The positive guiding role of performance appraisal in public hospitals has been brought into full play, and the effective application of performance appraisal results strengthened. The purpose of performance appraisal is to guide hospitals to focus on management rather than just on rankings. Therefore, governments at all levels need to establish a feedback and support system for the results of the "National Appraisal" and guide tertiary public hospitals to use the "National Appraisal" as an effective means to improve performance management and facilitate the transformation from appraisal to management. For example, the relevant departments of local governments should make public the scores of key indicators of the hospitals being appraised in a timely manner, provide data on the best practices of the benchmark hospitals, and guide hospitals to do benchmarking analysis against hospitals at the same level. By doing so, hospitals will be able to identify their own highlights and areas needing improvement through benchmarking analysis and improve the weak links in a targeted manner. Meanwhile, hospitals need to systematically increase staff motivation for performance appraisal, implement performance appraisal indicators into the daily work of departments and staff, and strengthen the application of performance appraisal data analysis and feedback to ensure that improvements are effectively made.

(4) The performance appraisal results of public hospitals are closely related to the government's input. After the abolition of the price markups on drugs and consumables in public hospitals, the income of hospitals mainly comes from healthcare services and government subsidies. Reasonable government subsidies and inputs are important guarantees for public hospitals to maintain sound operation, which directly affects the successful implementation of hospital performance appraisal. Increased government financial subsidies and inputs to hospitals within a certain period of time can alleviate patients' difficulty to access treatment and hospital operations, gradually lower the price of medical procedures, and increase

the control of healthcare quality and safety and medical cost, which will contribute to hospital operational efficiency, patient access improvement, and patient satisfaction (Lin et al., 2021)

5.3 Suggestions for policymakers

The implementation of a policy requires effective interactions and mutual influences between the implementers and the policy influencers to continuously facilitate policy adjustments (Elmore & Williams, 1976). Public hospitals are the main providers of healthcare services, and the main purpose of the state's introduction of the "National Appraisal" is to guide public hospitals to return to the public interest orientation, mobilize the initiative of clinicians, and accelerate transformation of the hospital performance management model. Using the indicators corresponding to the key stakeholders of public hospitals as a guide, the balanced scorecard as a tool, and tertiary public hospitals in prefecture-level cities, this study analyzes the changes brought by and challenges in the implementation of the "National Appraisal" as well as the drivers of its successful implementation. On this basis, this study makes the following policy recommendations for health authorities:

(1) The "National Appraisal" needs to be optimized continuously, and it is suggested that indicators reflecting the interests of clinicians be added. Clinicians are the main human resources of hospitals. Their interests are mainly reflected in improved salary packages, a positive working environment and career development opportunities, and these three interests are in an descending order of importance (R. F. Wang, 2017). Clinicians, as one type of key stakeholders of the "National Appraisal", play a pivotal role in the performance appraisal results and even affect the development of the whole hospital. The "National Appraisal" has limited indicators reflecting the interests of clinicians, and the indicators are mostly specific requirements for clinicians. This will largely affect their motivation. Therefore, it is necessary to fully consider the interests of doctors and nurse in the "National Appraisal" and increase the corresponding indicators reflecting their interests. For example, in the learning and growth dimension, public hospitals need to optimize the allocation of talents and prioritize the development of talents at different levels. To this end, they should increase the investment in providing training and learning opportunities to the internal staff, motivate clinicians to constantly update their knowledge and ideas, learn new medical technologies, and enhance their ability to continuously improve, thereby providing inexhaustible motivation for hospital development.

(2) It is recommended that differentiated appraisal with differentiated weights for each

indicator be implemented for hospitals at different levels and with differentiate availability of resources. The three-year "National Appraisal" ranking results show that the performance appraisal results of public hospitals are strongly associated with objective factors such as urban population, level of economic development, financial inputs, and geographic location, and different provinces have obvious differences in performance appraisal. Therefore, the basis and starting point for the development of tertiary hospitals in different locations and at different levels are different. Using a single set of indicators to measure the performance results of tertiary public hospitals in different locations and at different levels can easily lead to unreasonable and unfair results. For example, the "National Appraisal" guides clinicians to attach importance to improving scientific research and innovation capabilities and strengthening the integration of clinical and scientific research. To this end, it has set Indicator 50 (fund for scientific research projects per 100 health technicians ▲), which is weighted at 100 points for all tertiary hospitals.

In addition to sharing the research platform of universities, hospitals affiliated with Chinese universities and hospitals under provincial health commissions and the Ministry of Health also boast unique advantages in the introduction of research talents, while prefecture-level hospitals as "the middle layer of the sandwich" struggle to attract top-notch research talents and have weak research capacity. Worse still, this problem cannot be easily solved for the time being. This leads to a big gap between large-scale tertiary hospitals under provincial health commissions or the Ministry of Health ministry and prefecture-level tertiary hospitals in terms of research investment, research capacity, and research results. Therefore, measuring hospitals at different levels with the same set of indicators with the same weights will fail to provide effective references. Even if hospitals are aware of the gaps in indicator, they still lack the motivation for improvement. It is thus recommended that adjustments be made to the appraisal indicators for hospitals at different levels to truly give play to the guiding role of the "National Appraisal". The main function of prefecture-level hospitals and county-level hospitals is to deliver healthcare services to the public. The government needs to guide hospitals at these levels to focus more on clinical care and improve healthcare quality and medical technologies. It is suggested that the weights of appraisal indicators related to scientific research be reduced and the weights of indicators related to healthcare quality increased appropriately.

(3) It is suggested that an indicator on the number of referrals to higher-level hospitals be added. Due to the uneven distribution of quality resources in China, large Grade A tertiary hospitals are overcrowded with patients. To reasonably channel patients to different levels of hospitals and provide orderly healthcare services, the state has implemented the HDTS and has

set Indicator 2 (number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations)) in the "National Appraisal". However, it has not set appraisal indicators on the number of referrals to higher-level hospitals. The one-way referral indicator will cause higher-level hospitals to be less motivated, while township hospitals will not transfer patients to higher-level hospitals even if they cannot cure the patients' diseases due to their lagging medical technologies, which will directly delay the patients' conditions. It is recommended that an appraisal indicator on the number of referrals to higher-level hospitals be added to facilitate the implementation of the two-way referral system and eventually achieve orderly referrals among hospitals at different levels.

(4) It is recommended that health authorities at all levels set up a feedback and support system for the "National Appraisal" to fuel the transformation of hospital managers from focusing on performance appraisal to performance management to ultimately achieve improvement in both quality and efficiency. To meet the healthcare needs of local patients, health authorities should reasonably allocate local medical resources according to the size of population, demographic structure, common diseases, and frequently-occurring diseases in each region, match the number of public hospitals and beds with the local needs, and guide the development of hospitals at different levels in the region through top-level design. However, healthy competition needs to be fostered to facilitate the development of public hospitals. Public hospitals at all levels need to take the "National Appraisal" as an effective means to improve their core competitiveness in alignment with their own strategic goals. It is hoped that timely feedback from health authorities on the scores of key performance appraisal indicators of similar hospitals at the same level will provide data on key appraisal indicators of benchmark hospitals with the best practices and help hospitals identify their own strengths and weaknesses to further their improvement. In addition, health authorities need to monitor hospitals' analysis and application of performance appraisal data in a timely manner to improve the indicators with weak performance in a targeted manner. Health authorities also need to guide tertiary public hospitals to compare with other hospitals to identify their own differences and compare with themselves over different periods of time to identify their own change so as to facilitate their all-round improvement.

(5) It is recommended that more financial inputs be made and dedicated compensation funds allocated to public hospitals to prompt hospitals to return to the public interest orientation. According to the "Notice on the National Monitoring and Analysis of the Performance Appraisal of National Tertiary Public Hospitals in 2020", 43.5% of the tertiary public hospitals in China operated at a loss, and the proportion of hospitals that had suffered losses had increased

by 16.75% compared to 2019 (General Office of the National Health Commission of the PRC, 2022a). This shows that the debt ratio of tertiary public hospitals in China has been increasing year by year, and they are struggling with operation. Although the proportion of total health expenditure to the gross domestic product (GDP) has continued to increase over the same period, the proportion of financial subsidies public hospitals receive every year to their total hospital income still remains between 6% and 10% (National Health Commission of the PRC, 2021), and China's overall financial investment in the healthcare undertakings is much lower than that in Europe and the U.S. Public hospitals still generate most of their revenues from medical care, and increasing the share of government investment in total hospital revenue has a direct impact on patients' treatment experience and the public interest orientation of public hospitals. Health authorities need to increase investment in public hospitals on the one hand and evaluate the invested projects on the other hand to enhance the effectiveness of financial funds and help hospitals achieve sound development.

(6) Measures should be taken to help hospitals develop information technology, realize information integration, interconnectivity and interoperability, and provide data support for performance appraisal and management. Hospitals generate a large amount of medical data every day, and the process of data generation, collection, statistics, monitoring, and analysis is inseparable from the support of information technology. Therefore, it is necessary to strengthen effective interconnectivity between various information systems in hospitals, realize internal interconnectivity and interoperability, and ensure the quality of all types of data. The "function application level of the electronic medical record" (Indicator 24) is one of the key indicators of the "National Appraisal". As stated in the "Notice on the National Monitoring and Analysis of the Performance Appraisal of National Tertiary Public Hospitals in 2021", by the end of 2021, the average level of electronic medical record system application of tertiary public hospitals had reached 3.83, and 78.55% of the tertiary public hospitals reached Level 4 and above, while 9.75% of the tertiary public hospitals had reached Level 5 and above (General Office of the National Health Commission of the PRC, 2022b). The interconnectivity and interoperability among hospital information systems can provide objective data for hospital managers as well as doctors and nurse. Managers can make correct decisions through data analysis and improve performance management. However, information technology development requires a lot of human and financial resources and needs to be supported by health authorities.

(7) Differentiated medical insurance reimbursement policies should be implemented to guide patients to change their healthcare-seeking behavior. The purpose of China's HDTS is to enable medical institutions at various levels to clarify their functional positioning, optimize and

improve the existing healthcare service system, increase the consultation rates of primary healthcare institutions, guide patients to seek treatment in hospitals most appropriate to their diseases, and gradually form a hierarchical diagnosis and treatment model where hospitals at different levels have a clear division of responsibilities, coordinate with each other, and make upward and downward referrals when necessary (General Office of China's State Council, 2015b). Medical insurance policies are crucial for the realization of hierarchical diagnosis and treatment as the amount of medical costs borne by individuals can be adjusted through medical insurance reimbursement ratios to guide patients to choose hospitals at different levels for medical treatment. Differentiated medical insurance reimbursement ratios should be implemented in consideration of such factors as the hospital grade, whether healthcare services are provided outside the patient's hometown, and whether referrals have been made. However, the medical insurance policies in many cities in China are not conducive to keeping patients in local hospitals, but rather provide a very convenient reimbursement process and rate for patients to seek medical treatment away from their hometowns. Patients can choose to go to large hospitals in various provinces and cities without being referred by local hospitals, and the reimbursement rate only differs by 5%-10%. Such a slight difference is not enough to influence patients' treatment choices. Areas with a developed transportation network are bound to suffer the loss of patients.

In short, the government needs to ensure that the appraisal indicators they set are scientific and reasonable. They should ensure that the indicators not only play a positive guiding role but also fully consider their possible negative effects. The "National Appraisal" needs to balance the interests and needs of stakeholders under the premise of ensuring the public interest orientation of public hospitals, put patients at the center of healthcare, and effectively mobilize the initiative of clinicians to help hospitals achieve high-quality development.

5.4 Practical implications for hospital managers

Public hospitals are non-profit organizations. Using the balanced scorecard as a tool for performance appraisal helps public hospitals implement their functional positioning and achieve a balance between social and economic benefits. Hospital managers need to focus on the core issues of performance management, use the four dimensions of the balanced scorecard to analyze their own strengths and weaknesses, build on their strengths and avoid their weaknesses, facilitate the implementation of performance appraisal policies, and achieve innovative and transformation of the performance management model. This study has the

following practical implications for hospital managers:

(1) This study reminds hospitals managers of the importance to align the key indicators of the "National Appraisal" with the strategic development goals of hospitals. The balanced scorecard has been proven to be an effective tool for hospitals to implement multiple strategic goals in strategy development and implementation in healthcare organizations (Gil, 2010). The fundamental purpose of performance management in organizations is to achieve strategic goals and to translate strategy into employees' daily actions. Most public hospitals are oblivious of the relevance of organizational development strategies to performance appraisal, which ultimately renders national performance appraisal a mere formality. Hospital managers can effectively align performance appraisal with strategic goals with the help of the balanced scorecard, translate strategic goals into measurable and actionable specific goals in the four dimensions of the balanced scorecard, regard strategy as the core, strengthen the link between strategy and performance management, set measurable indicators and target values for performance appraisal around the strategic goals of the hospital, translate the organization's strategic goals into more specific plans and tasks through regular review of performance appraisal results to drive the implementation and improvement of the organization's strategies, and ultimately align the performance management system with the organizational strategies.

(2) Hospital managers are advised to optimize management processes and service processes and focus on key aspects of the patient treatment process. An important dimension to measure the internal process of public hospitals is healthcare quality. Hospital managers need to take effective measures to improve the indicators related to healthcare quality, build a comprehensive healthcare quality management system, and change medical practices through process management rather than adopting a simplistic and palliative approach. For example, three indicators should be improved, namely, Indicator 4 (proportion of discharged patients who underwent a surgery ▲), Indicator 5 (proportion of discharged patients who underwent a minimally invasive surgery ▲) and Indicator 6 (proportion of discharged patients who underwent a Level 4 surgery ▲). On the one hand, it is necessary to focus on developing the ability of clinicians to diagnose and treat intractable and complicated diseases and to treat and cure acute and severe diseases, to establish a system for discussing difficult cases and a system for rescuing patients with acute and critical diseases, and to clarify the allocation of rescue resources and the process of accessing emergency green channels; on the other hand, doctors should be encouraged to carry out new technologies and projects in clinical applications, increase the application of highly difficult technologies, and increase the salary for carrying out minimally invasive surgeries and Level 4 surgeries to guide clinicians to carry out more Level

4 surgeries, reduce the admissions of patients for Level 1 and Level 2 surgeries, and establish a minimally invasive interventional department and day surgery wards. The appraisal of clinicians should go beyond their workload to include the level of difficulty of diagnosis and treatment; the reward system should be changed from "more pay for more work" to "better pay for better work", and a salary distribution system reflecting the value of the expertise and work of clinicians should be set up.

In terms of management, it is necessary to adjust the resource allocation structure. For example, the ratio of the number of beds in the internal medicine department to that in the surgical department should be set according to the actual needs of local patients to encourage physician adoption of surgical procedures and adoption of minimally invasive procedures among surgeons. For Indicator 9 (surgical site infection rate of aseptic operations ▲) and Indicator 14 (mortality rate of cases in the low-risk group ▲), it is necessary to perform root cause analysis (RCA) of relevant patients and strengthen infection control and preoperative assessment system. Indicator 17 (defined daily dose (DDDs)▲) requires strict adherence to antimicrobial use guidelines, regulation of doctors' prescription of antimicrobial drugs, and regular evaluation of and feedback on the use of antimicrobial drugs. To increase the average outpatient appointment rate (Indicator 22) and shorten the average waiting time for an outpatient visit after the appointment (Indicator 23), hospitals need to optimize the process with the help of information technology and big data analysis.

(3) Hospital managers should improve the satisfaction of patients as well as clinicians. The customers of public hospitals include external customers and internal customers. Patients belong to external customers who care about healthcare quality, medical expenses, as well as access to quality and convenient healthcare services, while clinicians are the internal customers who are concerned about salary packages, career development, as well as training and work environment. Therefore, the customer dimension of public hospitals needs to reflect the interests of patients as well as clinicians, and satisfaction is an important appraisal indicator. As many as 35.5% of the "National Appraisal" indicators are related to patients' interests and needs, forcing hospitals to improve healthcare quality and optimize healthcare service process, reasonably control the growth of medical expense per visit and medication expense per visit, reduce patients' financial burden of hospital visits, reduce the ineffective waiting time of patients after making appointments, increase the comfort and convenience for patients to access healthcare services, and increase patient satisfaction and loyalty. As the trend of population aging persists in China, public hospitals need to consider "elderly friendly" healthcare service processes, set up green channels for the elderly, and implement initiatives to facilitate healthcare

services for the elderly, to provide quality and convenient healthcare services to more elderly patients. Besides, hospital managers need to pay attention to the interests of clinicians and increase their satisfaction. Increased satisfaction of internal and external customers will lead to more financial gains, higher market share, and reputation growth for hospitals (Sabella et al., 2014).

(4) Hospital mangers are encouraged to attach greater importance to employee learning and growth. The healthcare services provided by public hospitals are related to people's lives and health. Therefore, it is more important for clinicians to continuously learn and achieve innovation and breakthroughs in medical technologies to meet people's needs for healthcare services. The core competitiveness of tertiary public hospitals is to have a high level of medical technology and hospital management team. Hospitals are competing for high-end, precision and advanced medical technologies as well as leading top-notch researchers, but the available talents are limited after all. The learning and growth dimension reflects the hospital staff structure and the staff's ability to innovate and learn. Hospital managers need to attach greater importance to employee training, allocate a certain percentage of training budget each year, systematically design training contents from multiple perspectives such as staff structure, talent training, discipline development, as well as medical staff satisfaction, provide employees with external training opportunities, and carry out regular training for different positions (such as clinical, nursing, and administrative). Increased investment in training can help raise employees' awareness of quality, increases staff engagement and satisfaction, and is an important part of sustainable hospital development (Forza & Filippini, 1998). A hospital's discipline and talent development are the main contents of its learning and growth dimension of the balanced scorecard. Hospital managers need to guide the hospital to form a positive pattern where talents contribute to discipline development, which then contributes to hospital development.

(5) Hospitals should take measures to increase financial operation efficiency. Public hospitals, as non-profit organizations, should not regard pursuit of profits as their objective. However, as the Chinese government's fiscal allocation to public hospitals is not sufficient to cover hospital expenses, together with the reform of the medical insurance payment policy, hospitals can no longer depend solely on admitting more patients and using more drugs and consumables to achieve sound operation. Instead, they need to adjust the income structure by increasing the proportion of income from healthcare services to reflect the value of service provided by clinicians. Therefore, hospital managers need to strengthen cost control, increase resource utilization efficiency, and align key appraisal indicators of cost with comprehensive hospital budget management. Public hospitals need to swiftly "transform" their approaches to

development and achieve certain economic benefits and reasonable profits while ensuring public interest orientation to sustain daily operation and ensure sustainable development.

5.5 Contributions

The introduction of a unified "national appraisal" system for tertiary public hospitals across China in 2019 has highlighted the importance of performance management in the medical and health industry. However, there is limited research on this topic from the perspective of key stakeholders and the balanced scorecard, resulting in a lack of empirical research on the implementation of the "National Examination". As a result, this exploratory study on the implementation of the "National Appraisal" aims to contribute in the following ways:

Firstly, this study integrates the key stakeholder theory and the balanced scorecard to analyze the performance evaluation system of Chinese public hospitals. This approach provides a better understanding of the rationality of the appraisal system and identifies opportunities for future improvements. Furthermore, a balanced scorecard implementation model is developed based on the key stakeholders of public hospitals, which fills the research gaps in related fields and offers theoretical support and guidance for the effective implementation of the "National Appraisal". Overall, this study significantly enriches the academic research in the field of public hospital performance appraisal.

Secondly, this study clearly defines the key stakeholders of Chinese public hospitals through two rounds of Delphi expert consultation. This enriches the research on stakeholders of public hospitals in literature and serves as a valuable reference for future studies in this area.

Thirdly, the empirical results of this study reveal the achievements and deficiencies that have been attained since the implementation of the performance appraisal system of Chinese public hospitals. The findings provide ideas and references for consolidating the achievements and optimizing the "National Appraisal" system, contributing to policy recommendations that can benefit the entire medical and health industry.

Lastly, the research results of this study can facilitate the transformation of public hospitals from performance appraisal to performance management, guiding public hospitals to promote the implementation of the "National Appraisal" from the perspective of balance and core stakeholders. The study provides new ideas and methods for the performance management of public hospitals, offering a successful path for exploring and improving the performance management of public hospitals in China.

5.6 Limitations

This study mainly has the following three limitations.

First, this study only selects three tertiary public hospitals at the prefectural level for empirical research. The conclusions drawn from these three hospitals cannot represent the implementation effects of the "National Appraisal" in tertiary public hospitals at other levels in China.

Second, the "National Appraisal" has been implemented in hospitals for a relatively short period of time, and its impact on public hospitals needs to be observed over a longer timespan. The data on the implementation of the "National appraisal" collected from the sample hospitals only show the trends of changes in the performance of indicators over the three years from 2018 to 2020, and some of the data are not complete. Therefore, the research conclusions still need to be further verified by more studies in the future.

Third, the key stakeholders interviewed involved only a few representatives of health authorities. As a result, the results may not fully represent the interests of health authorities as a type of key stakeholders of public hospitals. This may have undermined the generalizability of the research results.

5.7 Suggestions for further research

The "National Appraisal" is a pioneering task that has been implemented for only around four years. Many issues need to be further explored and studied in the future to enhance the universal applicability of the research theory for other tertiary public hospitals to learn from and replicate. In view of this, this study puts forward the following four suggestions for further research.

First, as tertiary public hospitals in China differ significantly in the level of development and available resources, the implementation effects of the "National Appraisal" vary among hospitals at different levels. Future researchers can choose tertiary public hospitals at different levels to carry out further empirical research to provide references for hospital managers as well as clinicians at different levels. It would be rewarding to conduct empirical research with county-level tertiary hospitals as they are the most important players in the implementation of hierarchical diagnosis and treatment.

Second, the optimization and improvement of the "National Appraisal" is an ongoing process. The "National Appraisal" indicators need to be continuously adjusted and optimized to become more scientific and standardized. Future researchers are advised to explore means to

optimize the "National Appraisal" to make it more scientific and practical so as to contribute to its continuous improvement and optimization.

Third, as clinicians are the main providers of healthcare services, it is very necessary to carry out targeted research on the implementation effects of the national performance appraisal policies on clinicians and the respective implementation path.

Fourth, there is a high degree of relevance among different performance appraisal dimensions, and the indicators drive each other and have causal relationships. Further research needs to be carried out to explore which indicators hospitals should focus on to improve performance appraisal results.

5.8 Conclusions

This study reports an exploratory empirical study on the sample hospitals from the perspectives of stakeholder theory and the balanced scorecard. First, the relevance of the "National Appraisal" to the key stakeholders of hospitals and the four dimensions of the balanced scorecard is analyzed in depth. Following that, the archival data on the implementation of the "National Appraisal" in the sample hospitals over a three-year timespan and the data of interviews with key stakeholders of the sample hospitals are analyzed from multiple perspectives such as the positive changes brought about by the implementation of the "National Appraisal" and the concurrent challenges. On that basis, this study explores the main drivers of successful implementation of the "National Appraisal", seeks suggestions for optimizing the performance appraisal system, and discusses on the solutions and paths to improving performance management in public hospitals. The following conclusions are drawn.

(1) The key stakeholders of public hospitals include patients, hospital managers, clinicians, health authorities, and the public by order of importance. An analysis of the key indicators of the "National Appraisal" from the perspective of the key stakeholders of public hospitals shows that quite many indicators are relevant to hospital managers and patients while limited indicators are associated with clinicians as well as relevant and health authorities. Therefore, it is necessary to attach greater importance to the interests of clinicians and strengthen the role of health authorities in the "National Appraisal".

(2) The results of categorizing the key indicators of the "National Appraisal" into the four dimensions of the balanced scorecard show that the number of indicators related to internal business processes is the largest, followed by indicators related to the customer dimension; the number of indicators falling into the financial dimension is relatively reasonable; the number

of indicators belonging to learning and growth dimension is relatively small. However, the learning and growth dimension represents a hospital's capacity and motivation for sustainable development and reflects the interest and needs of clinicians.

(3) The "National Appraisal" needs to be optimized continuously. Specifically, indicators under the learning and growth dimension reflecting the interests of clinicians should be increased. Besides, it is hoped that differentiated appraisal with differentiated weights assigned to relevant indicators be implemented among tertiary public hospitals at different levels and in different locations.

(4) A hospital usually performs what are measured. The "National Appraisal" has acted as a baton in the three years from 2018 to 2020, bringing positive changes to hospitals in areas such as hierarchical diagnosis and treatment, medical technologies, healthcare quality, rational use of drugs, scientific research results, hospital information technology development, and patient service experience.

(5) The smooth implementation of the "National Appraisal" requires a balance between key stakeholders and the appraisal indicators, which is the core and key to effective implementation of the performance appraisal policies. Some of the "National Appraisal" indicators conflict with the interests of hospitals and patients in the process of implementation and cannot be effectively implemented. Health authorities need to continuously optimize the indicators to make them more scientific and reasonable.

(6) Greater emphasis should be paid to the application of performance appraisal results. A two-way feedback and support mechanism between health authorities and hospitals should be established to guide public hospitals to realize the transformation from performance appraisal to performance management, address the challenges faced by hospitals in the process of indicator implementation, and ultimately prompt hospitals to achieve high-quality development.

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Annex A: Delphi Round One Questionnaire

Expert Consultation Questionnaire on the Key Stakeholders of Tertiary Public Hospitals in China

Respected expert,

In January 2019, the General Office of China's State Council issued the "Opinions on Strengthening the Performance Appraisal of Tertiary Public Hospitals", marking the official launch of the unified hospital performance appraisal across the country. This expert consultation questionnaire is carried out to advance the effective implementation of the performance appraisal. Please take your valuable time to fill it out according to your professional judgment. This survey is for academic research on performance appraisal of tertiary public hospitals only, and the information you provide will be kept strictly confidential. Thanks very much for your support and cooperation!

Part 1: Identification of the Stakeholders of Tertiary Public Hospitals

Instructions:

Stakeholders in the performance appraisal of tertiary public hospitals are any group or individual who can affect the achievement of organizational goals while being influenced by the achievement of hospital goals in the operation of tertiary public hospital operations and the delivery of healthcare services. Nine different types of stakeholders are listed below based on the existing literature. Please indicate your level of agreement with the following nine types of stakeholders. The options are classified into six levels, from 1 = "strongly disagree" to 6 = "strongly agree". In case you think there are "other" stakeholders not mentioned here, please write them down.

Strongly agree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
1	2	3	4	5	6

(1) Health authorities

(2) Hospital managers

(3) Patients

(4) Clinicians

(5) Competitors

(6) Suppliers

(7) Industry associations

(8) The public (social residents and the ecological environment)

(9) Media

(10) Other (please specify): _____

Part 2: Background of Experts

Your position: _____

Education background: _____

Specialty: _____

Age:_____

Years of service in the current position: _____

Name of the hospital you are working at:

Annex B: Delphi Round Two Questionnaire

Expert Consultation Questionnaire on the Performance Appraisal System of Tertiary Public Hospitals in China

Respected expert,

To facilitate the effective performance appraisal of tertiary public hospitals, we have selected some experts for a second round of Delphi expert consultation based on round one results. Please take your valuable time to fill out this questionnaire according to your professional judgment. This survey is for academic research purpose only, and the information you provide will be kept strictly confidential. Thanks very much for your support and cooperation!

Part 1: Classification of Performance Appraisal Indicators for Tertiary Public Hospitals from the Balanced Scorecard Perspective

Instructions:

(1) The balanced scorecard, as a scientific performance appraisal tool, is favored by hospital managers in China and abroad. Besides attention to traditional financial indicators, it also emphasizes the assessment of non-financial indicators such as customers, internal business process, as well as learning and growth. Among them, (1) the financial dimension reflects a hospital's balance of income and expenditure, cost control, and liabilities; (2) the customer dimension mainly concerns the interests of hospital patients is measured by indicators such as functional positioning, patient cost control, and patient satisfaction; (3) the internal business process dimension reflects healthcare quality and operational efficiency; and the learning and growth dimension reflects the hospital's staff structure, talent training, discipline development, and medical staff satisfaction.

(2) With reference to the definitions of each dimension of the balanced scorecard, please assess to which dimension of the balanced scorecard the 30 key indicators of the "National Appraisal" belong and tick the corresponding dimension (single choice). If you think an indicator does not belong to any of the four given dimensions, please write down the name of the dimension you think the indicator belongs to in the "Other" column. Note: The indicators with "▲" are national monitoring indicators.

	Which dimension of the balanced scorecard do you think the indicator belongs to? (single choice) Please tick the corresponding dimension.				
Level 3 indicators	**Financial dimension (indicators related to finance)**	**Customer dimension (indicators concerning patients' interests)**	**Internal business process dimension (indicators on healthcare quality and efficiency)**	**Learning and growth dimension (indicators on talent cultivation and innovation)**	**Other dimension (please specify)**
2. Number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations)					
4. Proportion of discharged patients who underwent a surgery▲					
5. Proportion of discharged patients who underwent a minimally invasive surgery▲					
6. Proportion of discharged patients who underwent a Level 4 surgery▲					
8. Incidence of postoperative complications▲					
9. Surgical site infection rate of aseptic operations▲					
10. Single disease					

	Which dimension of the balanced scorecard do you think the indicator belongs to? (single choice) Please tick the corresponding dimension.				
Level 3 indicators	**Financial dimension (indicators related to finance)**	**Customer dimension (indicators concerning patients' interests)**	**Internal business process dimension (indicators on healthcare quality and efficiency)**	**Learning and growth dimension (indicators on talent cultivation and innovation)**	**Other dimension (please specify)**
quality control▲					
13. The number of clinical test items that have passed the national external quality assessment▲					
14. Mortality rate of cases in the low-risk group▲					
17. Defined daily dose (DDDs)▲					
22. Average outpatient appointment rate					
23. Average waiting time for an outpatient visit after the appointment					
24. Function application level of the electronic medical record▲					
25. Number of inpatients per doctor per day					
31. Proportion of					

	Which dimension of the balanced scorecard do you think the indicator belongs to? (single choice) Please tick the corresponding dimension.				
Level 3 indicators	**Financial dimension (indicators related to finance)**	**Customer dimension (indicators concerning patients' interests)**	**Internal business process dimension (indicators on healthcare quality and efficiency)**	**Learning and growth dimension (indicators on talent cultivation and innovation)**	**Other dimension (please specify)**
medical service revenue (excluding drugs, consumables, examination and testing revenue) to medical revenue▲					
33. Proportion of personnel expenditure to business expenditure▲					
34. Energy consumption expenditure per ten thousand yuan of income▲					
35. Balance of income and expenditure▲					
36. Asset-liability ratio▲					
37. Medical income growth rate					
38. Rate of increase in outpatients' medical expense per					

	Which dimension of the balanced scorecard do you think the indicator belongs to? (single choice) Please tick the corresponding dimension.				
Level 3 indicators	**Financial dimension (indicators related to finance)**	**Customer dimension (indicators concerning patients' interests)**	**Internal business process dimension (indicators on healthcare quality and efficiency)**	**Learning and growth dimension (indicators on talent cultivation and innovation)**	**Other dimension (please specify)**
visit▲					
39. Rate of increase in outpatients' medication expense per visit▲					
40. Rate of increase in average medical expense per inpatient▲					
41. Rate of increase in average medication expense per inpatient▲					
45. The proportions of anesthesiologists, pediatricians, intensive care specialists, pathologists and TCM practitioners▲					
46. Doctor-nurse ratio▲					
48. The pass rate of hospital residents taking the Qualification					

	Which dimension of the balanced scorecard do you think the indicator belongs to? (single choice) Please tick the corresponding dimension.				
Level 3 indicators	**Financial dimension (indicators related to finance)**	**Customer dimension (indicators concerning patients' interests)**	**Internal business process dimension (indicators on healthcare quality and efficiency)**	**Learning and growth dimension (indicators on talent cultivation and innovation)**	**Other dimension (please specify)**
Examination for Doctors for the first time▲					
50. Fund for scientific research projects per 100 health technicians▲					
53. Outpatient satisfaction▲					
54. Inpatient satisfaction▲					
55. Medical staff satisfaction▲					

Part 2: Identification of the Stakeholders of the Performance Appraisal Indicators of Tertiary Public Hospitals

Instructions:

Which hospital key stakeholder do you think each performance appraisal indicator issued by the state corresponds to? Please score the corresponding stakeholder column (single choice): "1' means relevant; "2" relatively relevant; "3" very relevant. If you believe that an indicator belongs to more than the five key stakeholders listed in the table, please add the specific stakeholder you believe in the "Other" column.

Level 3 indicators	**Please select the stakeholders corresponding to the appraisal indicator from the first five stakeholders and choose the score (single choice) in this column: 1 relevant; 2 relatively relevant; 3 very relevant. Please add in the "Other" column if the stakeholder does not belong to the five listed out.**					
	Hospital managers	**Clinicians**	**Patients**	**Health authorities**	**The public**	**Other (please specify)**
2. Number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations)						
4. Proportion of discharged patients who underwent a surgery▲						
5. Proportion of discharged patients who underwent a minimally invasive surgery▲						
6. Proportion of discharged patients who underwent a Level 4 surgery▲						
8. Incidence of postoperative complications▲						
9. Surgical site infection rate of aseptic operations▲						
10. Single disease quality control▲						
13. The number of clinical test items that have passed the national external quality assessment▲						
14. Mortality rate of cases in the low-risk group▲						

Level 3 indicators	**Please select the stakeholders corresponding to the appraisal indicator from the first five stakeholders and choose the score (single choice) in this column: 1 relevant; 2 relatively relevant; 3 very relevant. Please add in the "Other" column if the stakeholder does not belong to the five listed out.**					
	Hospital managers	**Clinicians**	**Patients**	**Health authorities**	**The public**	**Other (please specify)**
17. Defined daily dose (DDDs)▲						
22. Average outpatient appointment rate						
23. Average waiting time for an outpatient visit after the appointment						
24. Function application level of the electronic medical record▲						
25. Number of inpatients per doctor per day						
31. Proportion of medical service revenue (excluding drugs, consumables, examination and testing revenue) to medical revenue▲						
33. Proportion of personnel expenditure to business expenditure▲						
34. Energy consumption expenditure per ten thousand yuan of income▲						
35. Balance of income and expenditure▲						
36. Asset-liability ratio▲						
37. Medical income growth rate						
38. Rate of increase in outpatients' medical expense per visit▲						
39. Rate of increase in outpatients' medication expense per visit▲						
40. Rate of increase in average medical expense per inpatient▲						
41. Rate of increase in average medication expense per inpatient▲						
45. The proportions of anesthesiologists,						

Level 3 indicators	**Please select the stakeholders corresponding to the appraisal indicator from the first five stakeholders and choose the score (single choice) in this column: 1 relevant; 2 relatively relevant; 3 very relevant. Please add in the "Other" column if the stakeholder does not belong to the five listed out.**					
	Hospital managers	**Clinicians**	**Patients**	**Health authorities**	**The public**	**Other (please specify)**
pediatricians, intensive care specialists, pathologists and TCM practitioners▲						
46. Doctor-nurse ratio▲						
48. The pass rate of hospital residents taking the Qualification Examination for Doctors for the first time▲						
50. Fund for scientific research projects per 100 health technicians▲						
53. Outpatient satisfaction▲						
54. Inpatient satisfaction▲						
55. Medical staff satisfaction▲						

Part 3: Questionnaire on the Identification of the Key Stakeholders of Tertiary Public Hospitals

Instructions:

The results of the first round of expert questionnaires show that there are five types of key stakeholders in public hospitals as follows. Please express your level of agreement with the five types of stakeholders: The options are classified into six levels, from 1 = "strongly disagree" to 6 = "strongly agree". Please tick the appropriate column.

Stakeholders of public hospitals	Please express your level of agreement with the key stakeholders and tick the appropriate column (single choice).					
	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
Hospital mangers						
Clinicians						
Patients						
Health authorities						
The public (social citizens and the ecological environment)						

Part 4: Background of Experts

- Hospital Location: City_____, Province (autonomous region)_____
- Name of the hospital you are working at: _____
- Your position:_____ Your highest level of education:_____
  Specialty: _____
- Please tick the respective column to indicate how familiar you are with the performance appraisal indicator system of tertiary public hospitals.

Very unfamiliar	Unfamiliar	Somewhat unfamiliar	Somewhat familiar	Familiar	Very familiar

Annex C: Overview of the Three Sample Hospitals in 2020

Sample hospital	Hospital level	Year of establishment	Number of beds	Number of departments	Number of employees	Number of employees with deputy senior titles and above	Annual outpatient and emergency visits	Number of discharges	Annual income (billion yuan)
CZ	Grade A tertiary hospital	1937	2200	57	3,064	775	2,391,900	102,700	2.5
QY	Grade A tertiary hospital	1939	1780	52	3,169	407	1,821,200	75,800	2.18
GZ	Grade A tertiary hospital	1939	2800	59	3,500	525	1,300,000	1,360,000	1.9

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Annex D: Outline of the Semi-Structured Interviews with the Key Stakeholders of the Sample Hospitals

Respected experts,

In January 2019, the General Office of China's State Council issued the "Opinions on Strengthening the Performance Appraisal of Tertiary Public Hospitals", marking the official launch of the unified hospital performance appraisal across the country. This semi-structure interview is carried out to advance the effective implementation of the "National Appraisal". This interview is for academic research purpose only, and the information you provide will be kept strictly confidential. Thanks very much for your support and cooperation!

Part 1: Background of the interviewee

- Name of your hospital:_____
- Department:_____Position: _____
- Education background:_____Specialty: _____
- Years of service in the current position:_____

Semi-structure interview

Key stakeholders: Hospital managers

A1. Implementation of the "National Appraisal"

A1.1 Has your hospital set up an independent department to be responsible for the implementation of the "National Appraisal"?

A1.2 What are your role and tasks in the implementation of the "National Appraisal"?

A1.3 How does your hospital implement the "National Appraisal" and advance its implementation?

A1.3.1 How do you think clinicians are involved in the implementation of the "National Appraisal"? For example, how are the "National Appraisal" indicators linked to departmental and individual performance appraisal goals?

A1.3.2 How does your hospital collect data on the implementation of the "National Appraisal"?

A1.3.3 What are the influences the "National Appraisal" has had on the internal management of your hospital?

A2. The degree of stakeholder participation in the "National Appraisal" and the balance among them

A2.1 Which stakeholders do you think have been balanced in the implementation of the "National Appraisal"?

A2.2 How much responsibility do you think hospital managers take in the implementation of the "National Appraisal"? What is the approximate percentage?

A2.3 Are the indicators related to clinicians set reasonably in the "National Appraisal"? What are the areas that can be improved?

A2.4 To what extent have the indicators of the "National Appraisal" paid attention to the interests of patients?

A2.5 How can health authorities as key stakeholders be better reflected in the "National Appraisal"?

A3. Alignment of the "National Appraisal" with the hospital's strategic goals

A3.1 What are the strategic goals of your hospital?

A3.2 How is the "National Appraisal" linked to the strategic goals of your hospital?

A3.2 In addition to the "National Appraisal" indicators, has your hospital set internal appraisal indicators at the hospital, departmental and individual levels? To what extent are the internal appraisal indicators consistent with the "National Appraisal" indicators?

A4. Implementation results of the "National Appraisal"

A4.1 What positive changes has the implementation of the "National Appraisal" brought to your hospital?

A4.2 What challenges has your hospital encountered in the implementation of the "National Appraisal"?

A5. Drivers for successful implementation of the "National Appraisal" and suggestions for improvement

A5.1 What do you think are the main drivers of successful implementation of the "National Appraisal"?

A5.2 Do you think it necessary to further improve the "National Appraisal" indicator system? If yes, what indicators should be added or removed?

Key stakeholders: Clinicians

D1. Implementation of the "National Appraisal"

D1.1 Are you aware of the "National Appraisal"?

D1.2 How did you participate in the implementation of the "National Appraisal"? Are the

appraisal indicators of your department and yourself related to the indicators of the "National Appraisal"? How long is the appraisal period?

D2. The degree of stakeholder participation in the "National Appraisal" and the balance among them

D2.1 Which key stakeholders do you think are balanced in the implementation of the "National Appraisal"?

D2.2 How much responsibility do clinicians take in the implementation of the Appraisal? What is the approximate percentage?

D2.3 What are the specific appraisal indicators for clinicians? Are these indicators reasonable? Do they meet the demand for interest of clinicians? What aspects can be improved?

D2.4 To what extent have the appraisal indicators paid attention to the interests of patients? Are these indicators reasonable? Have they met the interests of patients? Do you have any suggestions for improvement?

D3. Alignment of the "National Appraisal" with the hospital's strategic goals

D3.1 What are the strategic goals of your hospital?

D3.2 How are the "National Appraisal" and the strategic goals of your hospital reflected in your daily work?

D4. Implementation results of the "National Appraisal"

D4.1 What positive changes has the implementation of the "National Appraisal" brought to the work of your department?

D4.2 What challenges have you encountered in the implementation of the "National Appraisal"?

D5. Drivers for successful implementation of the "National Appraisal" and suggestions for improvement

G5.1 What do you think are the main drivers of successful implementation of the "National Appraisal"?

G5.2 Do you think it necessary to further improve the "National Appraisal" indicator system? If yes, what indicators should be added or removed?

Key stakeholders: Health authorities

G1. Implementation of the "National Appraisal"

G1.1 Has the government set up an independent department to be responsible for the implementation of the "National Appraisal"?

G1.2 How do the health authorities advance the implementation of the "National Appraisal"

in your view?

G2. The degree of stakeholder participation in the "National Appraisal" and the balance among them

G2.1 Which stakeholders do you think have been balanced in the implementation of the "National Appraisal"?

G2.2 Which key stakeholders in your hospital are most affected by the "National Appraisal" results?

G2.3 Which stakeholder group do you think is primarily responsible for the results of the "National Appraisal"?

G3. Implementation results of the "National Appraisal"

G3.1 What positive changes has the implementation of the "National Appraisal" brought to your hospital?

G3.2 What challenges has your hospital encountered in the implementation of the "National Appraisal"?

G4. Drivers for successful implementation of the "National Appraisal" and suggestions for improvement

G4.1 What do you think are the main drivers of successful implementation of the "National Appraisal"?

G4.2 Do you think it necessary to further improve the "National Appraisal" indicator system? If yes, what indicators should be added or removed?

Key stakeholders: Patients

P1: How many times have you visited this hospital in the last three years? In what ways do you think this hospital has changed?

P1.1: Are there any changes in medical expenses?

P1.2: Is there any change in waiting time?

P1.3: Is there any change in medical technologies?

P1.4: Transportation-wise, is it convenience to visit this hospital?

P1.5: Did you visit this hospital because of its reputation?

P2: Are you satisfied with your visit to this hospital? How would you rate your degree of satisfaction on a scale from 0 to 100 points?

Annex E: Consistent Results of Respondents' Ratings of Key Stakeholders

Item	All respondents (N = 46)		Respondents at the vice president level or above (N=30)		Respondents at the president level (N=11)	
	Mean rank	Ranking	Mean rank	Ranking	Mean rank	Ranking
Health authorities	5.48	4	5.37	4	6.27	4
Hospital managers	6.90	1	7.02	1	6.86	1
Patients and their families	5.80	3	6.12	3	6.50	3
Clinicians	6.32	2	6.45	2	6.64	2
Competitors	4.52	6	4.40	6	3.59	7
Suppliers	3.62	8	3.62	8	2.95	9
Industry associations	4.21	7	4.07	7	4.23	6
The public	4.62	5	4.67	5	4.50	5
Media	3.53	9	3.30	9	3.45	8

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Annex F: Scores of Key Stakeholders in Delphi Round Two

Item	Clinicians (N=17)	Managers (N=12)	P value	Doctoral degree holders (N=13)	Master's degree holders (N=16)	P value	Total (N=29)
Hospital managers	5.29 (0.58)	5.67 (0.49)	0.084	5.54 (0.66)	5.38 (0.50)	0.454	5.45 (0.57)
Clinicians	5.29 (0.77)	5.50 (0.90)	0.515	5.08 (1.04)	5.63 (0.50)	0.073	5.38 (0.82)
Patients	5.35 (0.70)	5.67 (0.65)	0.233	5.46 (0.77)	5.50 (0.63)	0.884	5.48 (0.69)
Health authorities	4.65 (1.06)	5.33 (0.65)	0.057	5.08 (1.04)	4.81 (0.91)	0.471	4.93 (0.96)
The public	4.41 (0.87)	4.92 (0.67)	0.103	4.62 (1.04)	4.63 (0.62)	0.976	4.62 (0.82)

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Annex G: The Number and Proportion of Respondents Who Endorse the Relevance Between Each Item and Each Stakeholder

Item	Hospital managers	Clinicians	Patients	Health authorities	The public
2. Number of referrals to lower-level hospitals (outpatient and emergency visits, hospitalizations)	3 (10.3)	4 (13.8)	11 (37.9)	11 (37.9)	0
4. Proportion of discharged patients who underwent a surgery▲	13 (44.8)	12 (41.4)	3 (10.3)	1 (3.4)	0
5. Proportion of discharged patients who underwent a minimally invasive surgery▲	11 (37.9)	12 (41.4)	6 (20.7)	0	0
6. Proportion of discharged patients who underwent a Level 4 surgery▲	15 (51.7)	11 (37.9)	3 (10.3)	0	0
8. Incidence of postoperative complications▲	6 (20.7)	10 (34.5)	13 (44.8)	0	0
9. Surgical site infection rate of aseptic operations▲	6 (20.7)	11 (37.9)	12 (41.4)	0	0
10. Single disease quality control▲	12 (41.4)	9 (31.0)	7 (24.1)	1 (3.4)	0
13. The number of clinical test items that have passed the national external quality assessment▲	18 (62.1)	3 (10.3)	6 (20.7)	1 (3.4)	1 (3.4)
14. Mortality rate of cases in the low-risk group▲	7 (24.1)	11 (37.9)	11 (37.9)	0	0
17. Defined daily dose (DDDs)▲	12 (41.4)	7 (24.1)	8 (27.6)	0	2 (6.9)
22. Average outpatient appointment rate	8 (27.6)	0	19 (65.5)	0	2 (6.9)
23. Average waiting time for an outpatient visit after the appointment	7 (24.1)	0	20 (65.5)	0	2 (6.9)
24. Function application level of the electronic medical record▲	18 (62.1)	6 (20.7)	2 (6.9)	3 (10.3)	0
25. Number of inpatients per doctor per day	7 (24.1)	22 (75.9)	0	0	0
31. Proportion of medical service revenue (excluding drugs, consumables, examination and testing revenue) to medical revenue▲	22 (75.9)	6 (20.7)	0	1 (3.4)	0
33. Proportion of personnel expenditure to business expenditure▲	15 (51.7)	11 (37.9)	1 (3.4)	2 (6.9)	0
34. Energy consumption expenditure per ten thousand yuan of income▲	24 (82.8)	1 (3.4)	1 (3.4)	1 (3.4)	2 (6.9)
35. Balance of income and expenditure▲	24 (82.8)	2 (6.9)	1 (3.4)	2 (6.9)	0
36. Asset-liability ratio▲	22 (75.9)	0	1 (3.4)	6 (20.7)	0
37. Medical income growth rate	18 (62.1)	5 (17.2)	4 (13.8)	2 (6.9)	0
38. Rate of increase in outpatients' medical expense	7 (24.1)	3	18	1 (3.4)	0

Item	Hospital managers	Clinicians	Patients	Health authorities	The public
per visit▲		(10.3)	(62.1)		
39. Rate of increase in outpatients' medication expense per visit▲	6 (20.7)	4 (13.8)	18 (62.1)	1 (3.4)	0
40. Rate of increase in average medical expense per inpatient▲	5 (17.2)	3 (10.3)	18 (62.1)	3 (10.3)	0
41. Rate of increase in average medication expense per inpatient▲	5 (17.2)	4 (13.8)	17 (58.6)	3 (10.3)	0
45. The proportions of anesthesiologists, pediatricians, intensive care specialists, pathologists and TCM practitioners▲	12 (41.4)	12 (41.4)	2 (6.9)	3 (10.3)	0
46. Doctor-nurse ratio▲	16 (55.2)	10 (34.5)	2 (6.9)	1 (3.4)	0
48. The pass rate of hospital residents taking the Qualification Examination for Doctors for the first time▲	10 (34.5)	15 (51.7)	2 (6.9)	1 (3.4)	1 (3.4)
50. Fund for scientific research projects per 100 health technicians▲	16 (55.2)	8 (27.6)	0	3 (10.3)	2 (6.9)
53. Outpatient satisfaction▲	1 (3.4)	3 (10.3)	22 (75.9)	1 (3.4)	2 (6.9)
54. Inpatient satisfaction▲	1 (3.4)	7 (24.1)	18 (62.1)	1 (3.4)	2 (6.9)
55. Medical staff satisfaction▲	4 (13.8)	24 (82.8)	0	1 (3.4)	0

Annex H: The Trend of Change in the Key Performance Appraisal Indicators Among GZ Hospital Managers from 2018 to 2020



Note: The indicators in the red square brackets are financial indicators; those in the yellow square brackets are internal business process indicators; and those in the black square brackets are learning and growth indicators.

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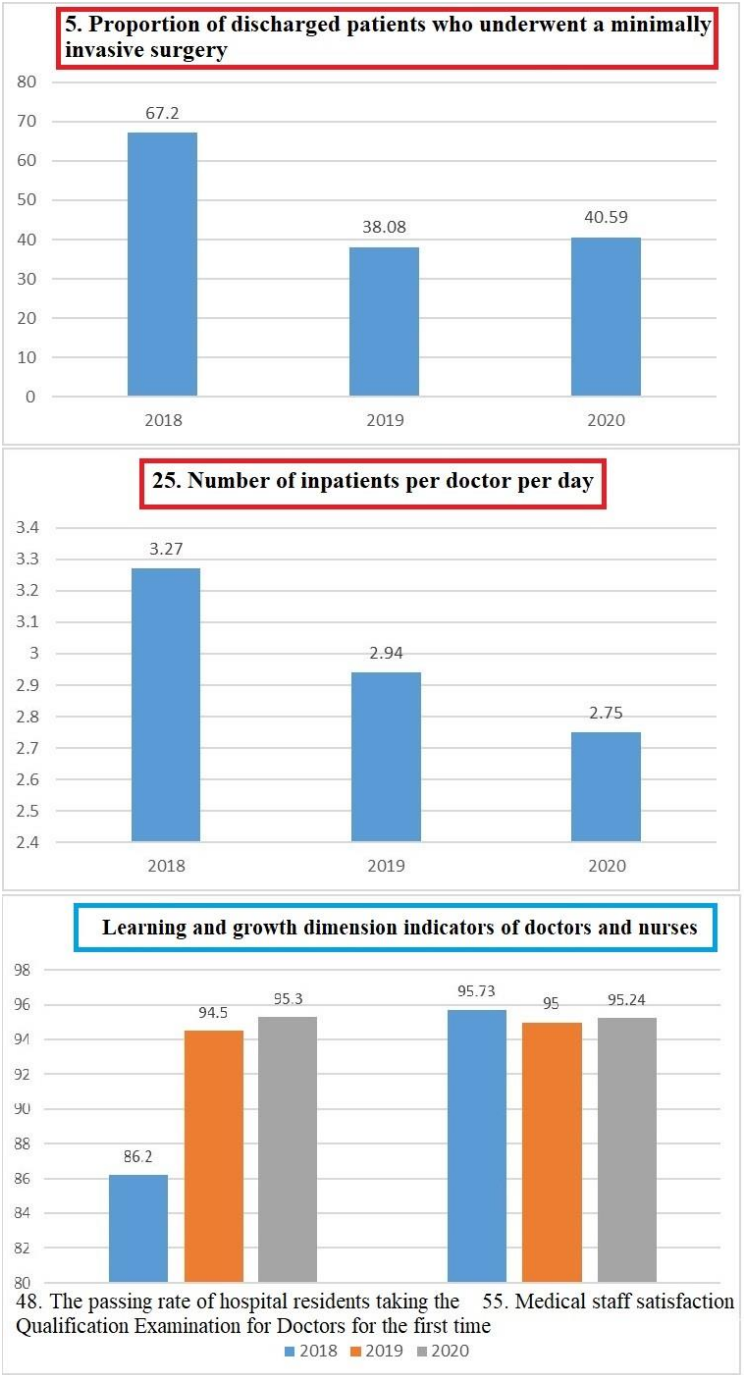
Annex I: The Trend of Change in the Key Performance Appraisal Indicators Among QY Hospital Managers from 2018 to 2020



Note: The indicators in the red square brackets are financial indicators; those in the yellow square brackets are internal business process indicators; and those in the black square brackets are learning and growth indicators.

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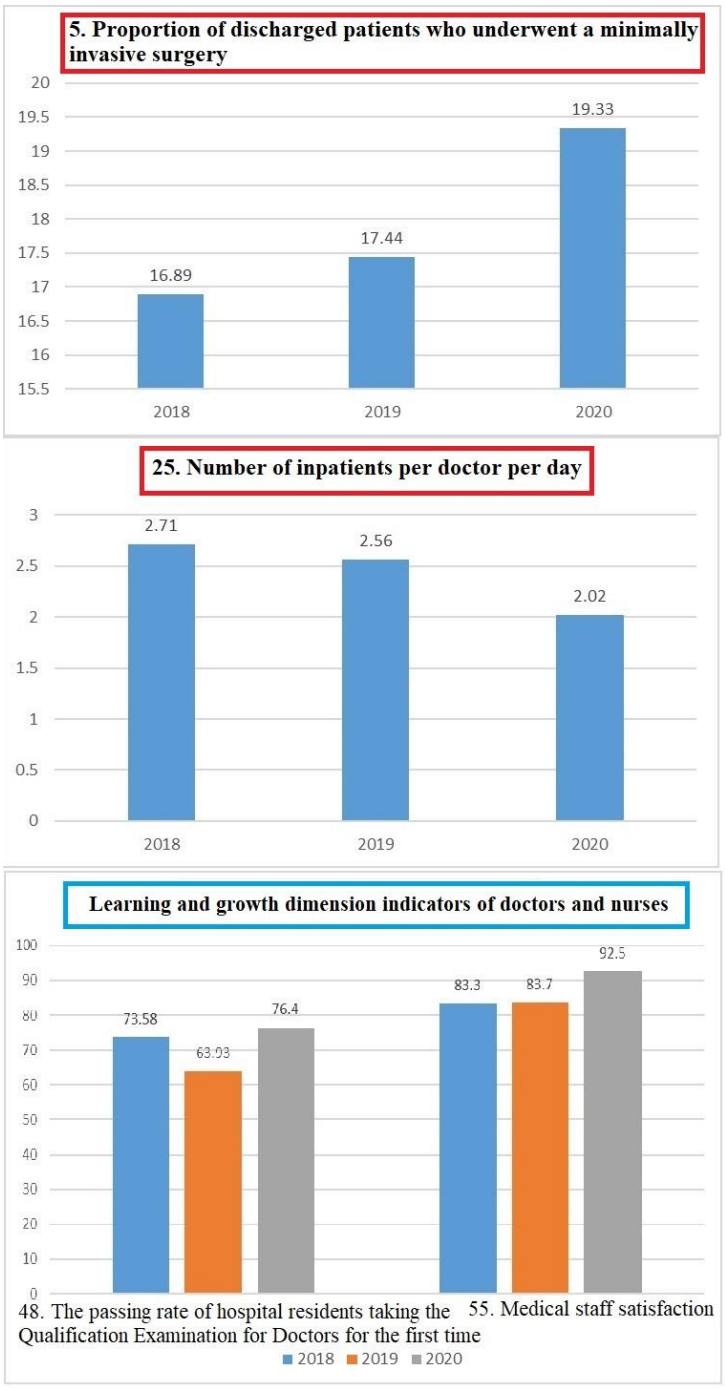
Annex J: Trend of Change in the Relevant Performance Appraisal Indicators Among Clinicians in GZ Hospital from 2018 to 2020



Note: The indicators in the red square brackets are internal business process indicators; and those in the blue square brackets are learning and growth indicators.

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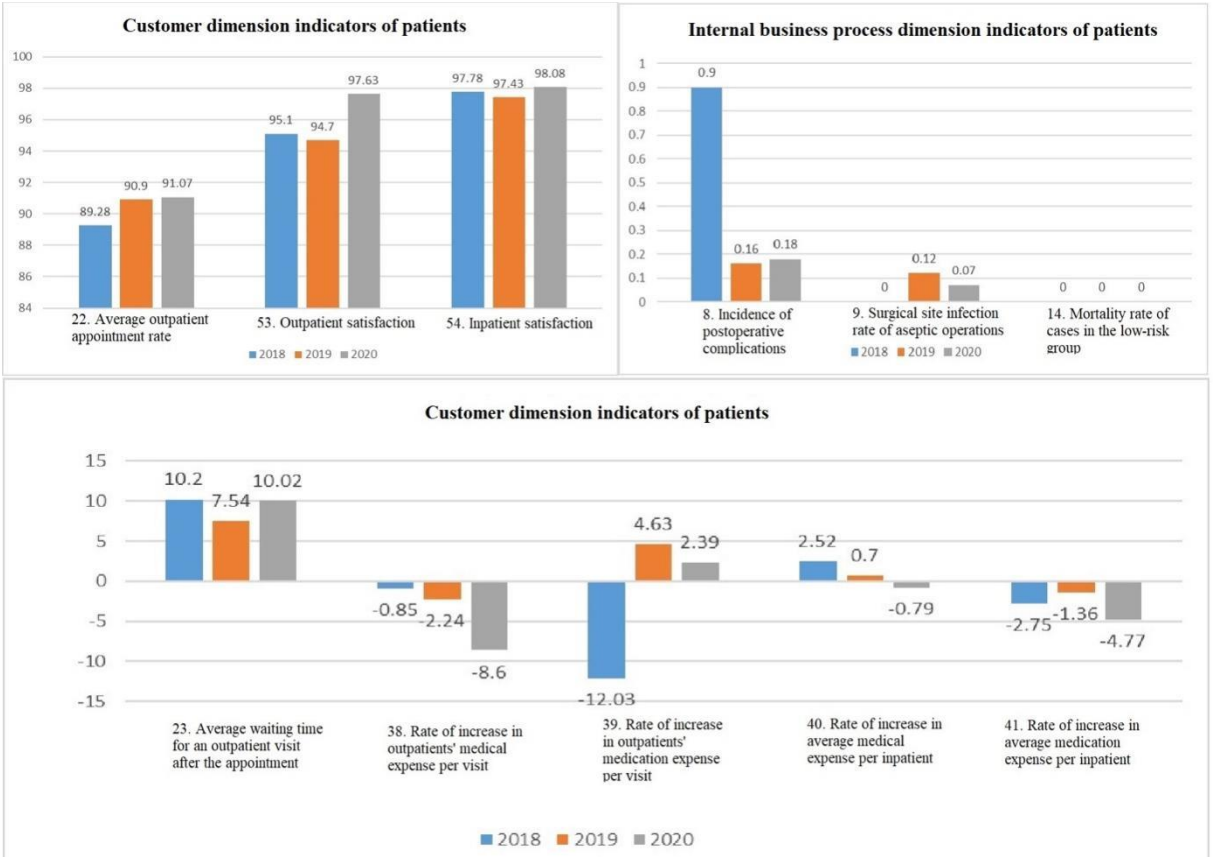
Annex K: Trend of Change in the Relevant Performance Appraisal Indicators Among Clinicians in QY Hospital from 2018 to 2020



Note: The indicators in the red square brackets are internal business process indicators; and those in the blue square brackets are learning and growth indicators.

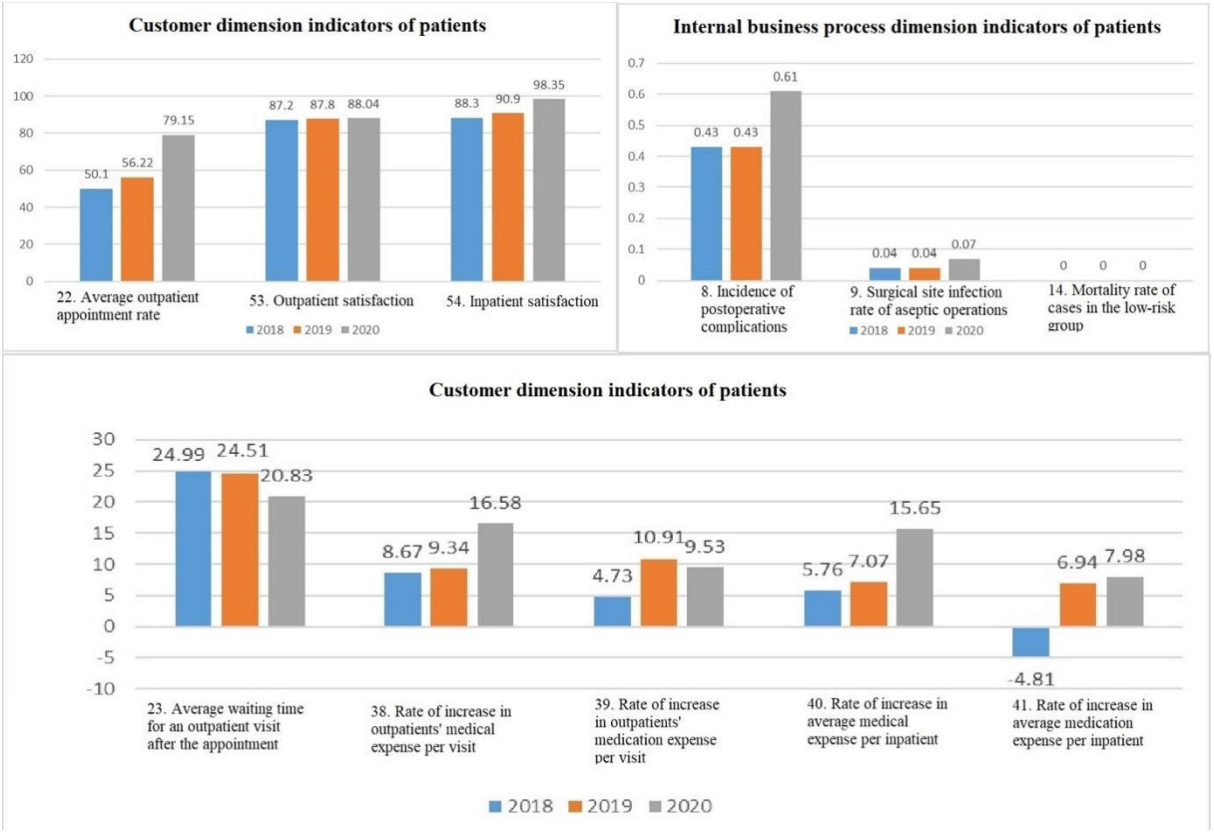
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Annex L: Trend of Change in the Relevant Performance Appraisal Indicators Among Patients in GZ Hospital from 2018 to 2020



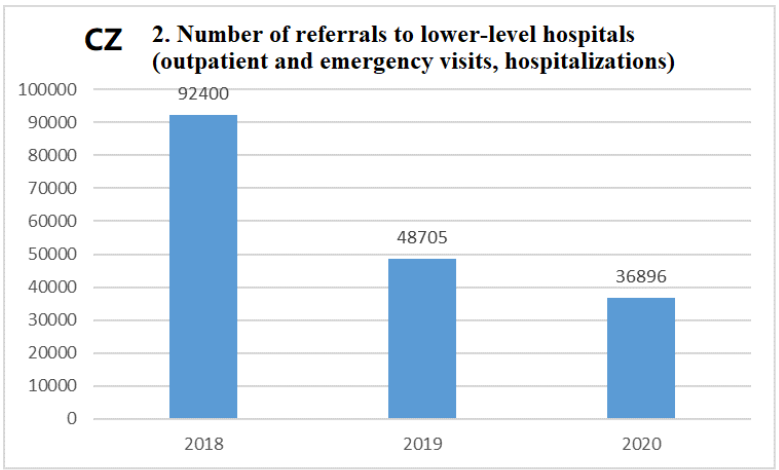
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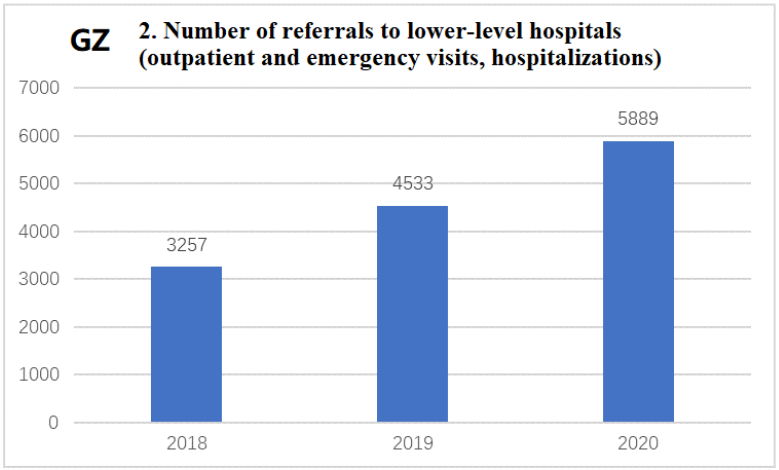
Annex M: Trend of Change in the Relevant Performance Appraisal Indicators Among Patients in QY Hospital from 2018 to 2020

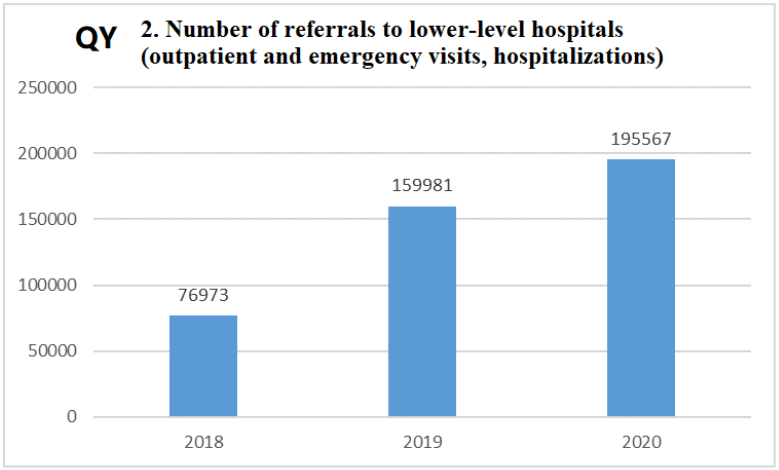


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Annex N: Trend of Change in Key Performance Appraisal Indicators Among Health Authorities from 2018 to 2020







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Annex O: The Changes That the Implementation of the "National Appraisal" Has Brought to Hospitals (Level-1 Coding Word Cloud)



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Annex P: Changes Brought by the Implementation of the "National Appraisal" from the Perspective of Key Stakeholders (Level 2 codes)

Stakeholder	Level 2 codes	Frequency of QY Hospital	Frequency of GZ Hospital	Frequency of CZ Hospital	Total frequency
Hospital managers		4 interviewees	5 interviewees	7 interviewees	16 interviewees
	Clarification of hospital development direction	9	10	15	34
	Advocation of difficult surgeries	1	1	20	22
	Enhancement in hospital operation efficiency	5	5	10	20
	Improvement in management	6	3	2	11
	Improvement in discipline development	2	4	4	10
	Improvement in healthcare services	3	4	3	10
	Rational allocation of resources	4	1	3	8
	Admission of patients according to the positioning of Grade A tertiary hospitals	7	1	0	8
	Emphasis on patients' interests	1	2	3	6
	Increase in the number of talents	1	0	4	5
	Standardized diagnosis and treatment	2	1	1	4
	Development of doctors' business capability	1	0	1	2
	Provision of reform drivers	1	1	0	2
	Increase in staff satisfaction	0	1	0	1
Clinicians		3 interviewees	3 interviewees	4 interviewees	10 interviewees
	Improvement in healthcare services	2	3	2	7
	Enhancement in hospital operation efficiency	0	3	1	4
	Development of doctors' business capability	1	0	3	4
	Clarification of hospital development direction	4	0	0	4
	Advocation of difficult surgeries	0	0	2	2

Stakeholder	Level 2 codes	Frequency of QY Hospital	Frequency of GZ Hospital	Frequency of CZ Hospital	Total frequency
	Standardized diagnosis and treatment	0	1	1	2
	Rational allocation of resources	0	1	0	1
Health authorities		None	1 interviewee	1 interviewee	2 interviewees
	Clarification of hospital development direction		1	1	2
	Emphasis on patients' interests		1	1	2
	Increase in staff satisfaction		1	0	1
	Improvement in management		1	0	1
	Improvement in healthcare services		0	1	1

Annex Q: Challenges Brought by the Implementation of the "National Appraisal" from the Perspective of Key Stakeholders (Level 2 Codes)

Stakeholder	Level 2 codes	Frequency of QY Hospital	Frequency of GZ Hospital	Frequency of CZ Hospital	Total frequency
Hospital managers		4 interviewees	5 interviewees	6 interviewees	15 interviewees
	Lack of professional talents	5	1	7	13
	Need for financial input in multiple aspects	2	4	5	11
	Lack of general applicability of the indicators	1	3	6	10
	Difficulty in obtaining target patients	5	0	0	5
	Conflict between indicators and patients' needs	0	5	0	5
	Higher requirements on staff's level of expertise	2	1	2	5
	Conflict between indicators and hospital needs	2	2	0	4
	Conflict between indicators and the interest of clinicians	1	2	0	3
	Conflict between indicators and the diagnosis and treatment standards	0	2	0	2
	Impact of the COVID-19 pandemic	0	0	2	2
Clinicians		3 interviewees	3 interviewees	4 interviewees	10 interviewees
	Difficulty in obtaining target patients	2	7	1	10
	Lack of professional talents	0	1	3	4

	Conflict between indicators and patients' needs	1	2	1	4
	Higher requirements on staff's level of expertise	1	0	1	2
	Conflict between indicators and the interest of clinicians	1	1	0	2
	Lack of general applicability of the indicators	0	0	1	1
	Need for financial input in multiple aspects	1	0	0	1
	Conflict between indicators and hospital needs	0	1	0	1
Health authorities		None	1 interviewee	1 interviewee	2 interviewees
	Conflict between indicators and hospital needs		2	1	3
	Conflict between indicators and patients' needs		1	0	1
	Lack of general applicability of the indicators		0	1	1
	Difficulty in obtaining target patients		0	1	1

Annex R: Challenges Brought to Hospitals by the Implementation of the "National Appraisal" (Level 1 Coding Word Cloud)

